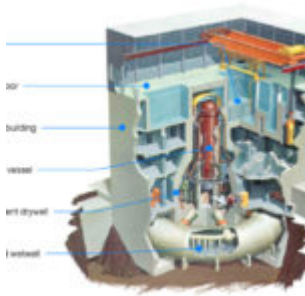


Fukushima – ein Zwischenbericht



...da warn´s nur noch drei

Anfang August ging die Meldung um die Welt, daß über 90% der Brennelemente (1166 von 1331 abgebrannten Brennelementen) aus dem Lagerbecken des Blocks 4 geborgen und abtransportiert sind. Man erwartet bis Ende des Jahres die vollständige Räumung. Wir erinnern uns: Zum Zeitpunkt der Naturkatastrophe war der Block 4 für einen planmäßigen Brennelementewechsel außer Betrieb. All seine Brennelemente waren nicht mehr im Reaktordruckgefäß, sondern bereits im zugehörigen Lagerbecken. Dieses Lagerbecken wurde infolge der Wasserstoffexplosion mit Trümmern der "Reaktorhalle" zugeschüttet. Kein schöner Anblick und überdies

vermeidbar, wenn man eine übliche "Betonhülle" um das Kernkraftwerk gebaut hätte. Um es auch unserer – von der japanischen Industriegesellschaft so enttäuschten – Kanzlerin und ihren Jüngern aus CD(S)U und FDP noch einmal klar und deutlich zu sagen: Ein solcher Schadensverlauf ist in einem Kernkraftwerk in Deutschland technisch ausgeschlossen. Jedes Kernkraftwerk in Deutschland (und fast alle auf der Welt) haben eine Stahlbetonhülle, die einer solch kleinen Explosion locker stand hält. Kein Reaktor in Deutschland ist mit einem anderen Block über eine gemeinsame Lüftungsanlage verbunden. Insofern hätte es in einem deutschen Kernkraftwerk (und in fast allen auf der Welt) gar kein explosives Gas geben können. Selten kann ein Ingenieur eine so eindeutige Aussage treffen.

An diesem Unfall sieht man, welch

robuste Konstruktion ein Siedewasserreaktor an sich ist. Selbst eine schwere Explosion mit Einsturz der Reaktorhalle führt zu praktisch keiner Freisetzung von Radioaktivität in die Umwelt. Jeder moderne Reaktor hat darüber hinaus noch beträchtliche weitere Sicherheitsreserven. Dies ist auch der Grund, warum nur diese Reaktoren in Fukushima bei dem Tsunami und dem vorausgehenden Erdbeben kaputt gegangen sind. Es war nicht ohne Grund geplant, sie einige Monate später still zu legen. Eine bittere Lektion, die Japan aber angenommen hat: Alle Reaktoren befinden sich immer noch in einer umfangreichen Überprüfung. Es ist absehbar, daß einige nie mehr wieder in Betrieb gehen werden.

Wenn alle Brennelemente aus dem Block 4 ausgeräumt sind, ist das Kapitel faktisch abgeschlossen: Es verbleibt eine technische Ruine, die man auch als Denkmal stehen lassen könnte. So

lange man sie nicht betritt, ist sie genauso ungefährlich, wie ein "Bankpalast" aus Granit. Der japanischen Gemütslage entsprechend, wird man aber eher nicht innehalten, sondern nicht eher ruhen, bis man das Grundstück in eine Rasenfläche verwandelt hat.

Die Problemruinen

**Weiterhin
problematisch sind
die ersten drei
Reaktoren des
Kraftwerks. Sie
waren zum Zeitpunkt**

**des Erdbebens in
Betrieb und sind
durch den Ausfall
der erforderlichen
Nachkühlung
zerstört worden.
Bisher ergibt sich
immer noch kein
eindeutiges Bild:
Die Strahlung in
unmittelbarer Nähe
der Reaktoren ist**

**noch so stark, daß
man keine Menschen
zur Untersuchung
einsetzen kann und
will. Japan ist
nicht Russland.
Bisher hat man sich
nur mit Robotern
versucht zu nähern.
Dies ist aber
schwieriger, als es
den Anschein hat.**

**Man hat ein extrem
schwieriges
Einsatzgebiet, das
überdies noch durch
Trümmer versperrt
ist. Zum großen
Teil steht es auch
noch unter Wasser.
Solange man aber
keinen genauen
Überblick hat, kann
man auch keinen**

**Bergungsplan
ausarbeiten. Hier
ist noch von
jahrelanger Arbeit
auszugehen. Sie
vollzieht sich auf
mehreren parallelen
und sich
ergänzenden Ebenen.**

**Jedes mal, wenn man
an ein
unüberwindlich**

**scheinendes
Hindernis gelangt,
muß man sich erst
neue
Spezialvorrichtunge
n und modifizierte
Roboter entwickeln,
bauen und testen.
Inzwischen arbeitet
man weltweit
(insbesondere mit
den USA und**

**Großbritannien)
zusammen, die
bereits über
umfangreiche
Erfahrungen aus dem
Abbruch ihrer
militärischen
Anlagen verfügen.
Hier wird eine
beträchtliches
technisches Wissen
entwickelt, das**

**weit über das
Niveau von
"Windmühlen" und
"Sonnenkollektoren"
hinausgeht. Die
deutsche Industrie
wird das dank ihrer
Verweigerungshaltung
in einigen Jahren
noch auf ganz
anderen Gebieten
bitter zu spüren**

bekommen .

**Zur Zeit scheut
Japan jedenfalls
keine Kosten und
Mühen. Als ein
Beispiel mag die
Myonen-Analyse
dienen. Myonen sind
Elementarteilchen,
die z. B. in großen
Mengen durch die
kosmische Strahlung**

**in der oberen
Erdatmosphäre
gebildet werden.
Diese Myonen
treffen zu
Tausenden, jede
Minute auf jeden
Quadratmeter
unserer
Erdoberfläche
(Anmerkung: Wann
demonstriert**

**Greenpeace endlich
gegen diese
unverantwortliche
Strahlenbelastung?**

Vorschlag:

**Gottesstrahlen in
Köln hunderte male
stärker, als die
Strahlenbelastung
aus Fukushima). Ein
großer Teil dieser
Strahlung**

**durchdringt auch
massive Bauwerke.
Allerdings werden
die Teilchen
abhängig von der
lokalen Dichte
gestreut. Mißt man
nun die
"Flugbahnen" der
Myonen vor dem zu
untersuchenden
Objekt und nach der**

Durchdringung, so erhält man ein sehr genaues Bild der Zusammensetzung. Ganz ähnlich einer Röntgenaufnahme: Die dichteren Knochen zeichnen sich deutlich von sonstigem Gewebe ab. Da nun Uran und Plutonium eine –

**auch gegenüber
allen Baustoffen,
wie Stahl, Beton
usw. –
außergewöhnlich
hohe Dichte
besitzen, erwartet
man ein ziemlich
genaues Bild der
Uranverteilung in
den
Unglücksreaktoren.**

**Erst dann kann man
sinnvoll und
risikolos Löcher
für Kameras etc.
bohren, um sich ein
abschließendes Bild
zu machen.**

**Ein weiterer Weg
ist die Analyse
durch "nachrechnen"
des Unfallablaufes.
Solche Rechnungen**

**sind allerdings mit
erheblichen
Unsicherheiten
versehen, da man
nicht über
ausreichende
Messwerte über die
tatsächlichen
Zustände während
des Unglücks
verfügt. Sie sind
solange nur als**

**grobe Abschätzungen
zu werten, solange
man keine
"Aufnahmen" der
tatsächlichen
Brennelement-Reste
vorliegen hat.
Allerdings läßt
sich die
Aussagefähigkeit
der Berechnungen
Schritt für Schritt**

**mit jeder neu
gewonnenen Messung
verbessern. Es
verwundert daher
nicht, daß die
Ergebnisse
verschiedener
Institutionen noch
recht weit
auseinanderliegen:
Man glaubt bisher,
daß der gesamte**

**Brennstoff des
ersten Reaktors
(ca. 77 to) damals
aufgeschmolzen und
weitestgehend aus
dem
Reaktordruckbehälter
r ausgelaufen ist
und sich unterhalb
in der
Reaktorkammer
gesammelt hat. Bei**

**den Blöcken 2 und 3
gehen die
Rechenergebnisse
noch weiter
auseinander. Hier
glaubt man, daß
mindestens noch ein
Drittel (von je 107
to) sich in den
Druckbehältern
befindet.**

**Der
Dauerbren
ner
Abwasser
Seit dem**

**Unglück
steht die
Belastung
des
Grundwass
ers und**

**etwaige
Belastung
en des
Meerwasse
rs im
Vordergru**

**nd. Das
Kraftwerk
steht an
einer
Hanglage.
Schon**

immer

sind

große

Regenwass

ermengen

unterirdi

sch um

das

Kraftwerk

geflossen

. Der

Grundwass

**erspiegel
war so
hoch, daß
alle
unterirdi
schen**

**Kanäle
und
Keller im
Grundwass
er
stehen .**

**Während
des
Betriebs
hat man
durch
Entwässer**

**ung den
Grundwass
erspiegel
ständig
abgesenkt
gehalten.**

**Dieses
Drainages
ystem ist
aber
durch den
Tsunami**

**und das
Erdbeben
zerstört
worden.
Folglich
stieg der**

**Wassersta
nd an und
die
Gebäude
schwammen
auf und**

soffen

ab. Da

die

technisch

en

Anlagen

**ebenfalls
undicht
wurden,
mischte
sich das
austreten**

de

radioakti

v

belastete

Kühlwasse

r ständig

**mit dem
Grundwass
er im
Kellerber
eich. Die
bekannten**

**Probleme
entstande
n.**

**Inzwischen
hat man
überhalb**

**des
Kraftwerk
s eine
Speerwand
errichtet
um den**

**Grundwass
erstrom
einzudämm
en. Vor
dieser
Sperrzone**

wird

durch

Brunnen

das

Grundwass

er

entzogen .

Dies ist

eine

Technik,

wie man

sie bei

**vielen
Baustelle
n
weltweit
anwendet.
Das**

**abgepumpt
e Wasser
wird um
das
Kraftwerk
herum**

geleitet.

Am 2. Mai

wurden

zum

ersten

mal 561

m^3

**Wasser in
Anwesenhe
it von
Journalis
ten und**

**Fischern
ins Meer
geleitet.
Voller
Stolz
verkündet**

e man ,
daß die
Grenzwert
e für die
Einleitung
g ins

Meer auf

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gemessene

Werte

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als

$1/100$)

der

Grenzwert

e für

Trinkwass

er

festgesetz

zt

wurden .

An der

**gesamten
Uferlänge
vor dem
Kraftwerk
hat man
eine**

**Spermauer
r
errichtet
, die 30
m tief
unter den**

**Meeresboden
bis in
eine
wasserund
urchlössige**

**Bodenschicht
reicht.**

**Vor
dieser
Sperrmaue**

r wird

das

angeström

te

Grundwass

er

**ständig
abgepumpt
· Durch
diese
Maßnahmen
kann**

praktisch

kein

radioakti

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Wasser

mehr in

**das Meer
gelangen.
Durch die
Sanierung
des
zerstörte**

n

Abwassers

ystems

auf dem

Gelände,

ist es

**gelingen
den**

**Grundwass
erspiegel
wieder
auf das**

alte

Niveau

abzusenke

n. Damit

kann

nicht

mehr so

viel

Grundwass

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**Kellerräu
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**eindringe
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**sich dort
mit einem**

**Teil des
Kühlwasser
s**

**vermische
n. Dies
hat zu**

**einer
Verringer
ung der
zu
lagernden
radioakti**

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Wässer um

etwa die

Hälfte

geführt.

Um

**Längerfri
stig
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den
gesamten
Zustrom**

zu

stoppen,

hat man

seit Juni

begonnen

das

**Kraftwerk
unterirdi
sch
komplett
einzufrie
ren .**

**Diese
Arbeiten
werden
sich noch
bis weit
ins**

nächste

Jahr

hinziehen

. Sind

die

"Eiswände

**" fertig,
kann das
Grundwass
er
unkontami
niert um**

**die Ruine
herum
fließen.**

**Bis März
sollen
über 1550**

**Bohrungen
30 bis 35
m tief
abgesenkt
, und mit
Kühlflüss**

**igkeit
gefüllten
Rohrleitu
ngen
ausgestat
tet**

werden .

Diese

werden

dann mit

Kühlfluss

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von -30°C

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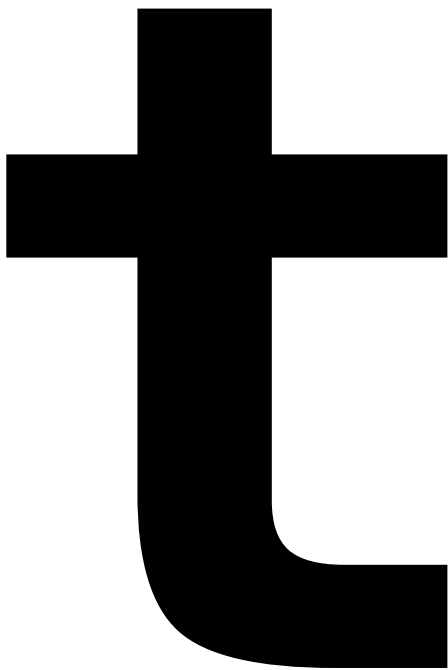
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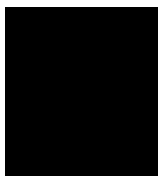
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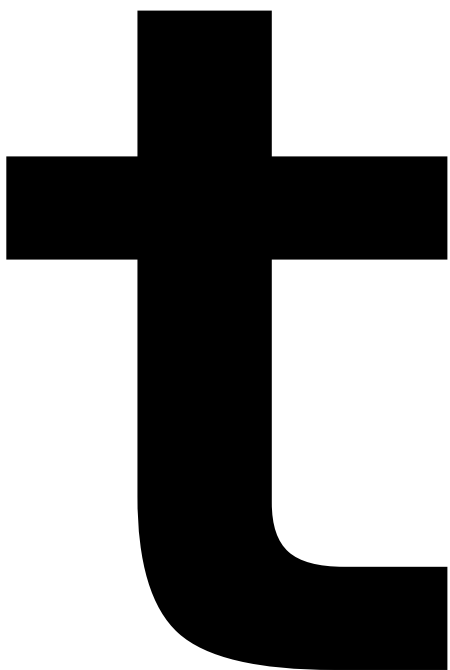
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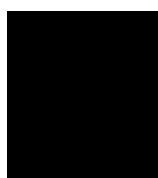
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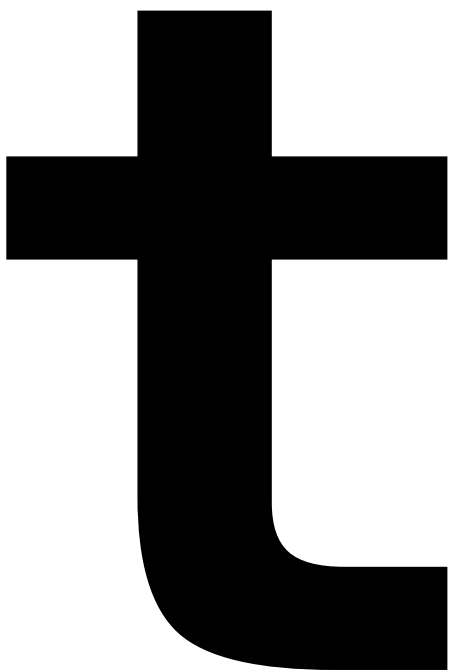
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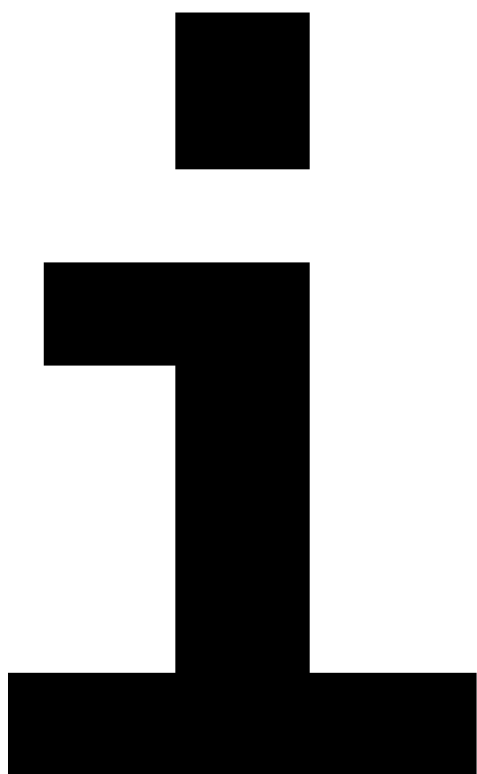
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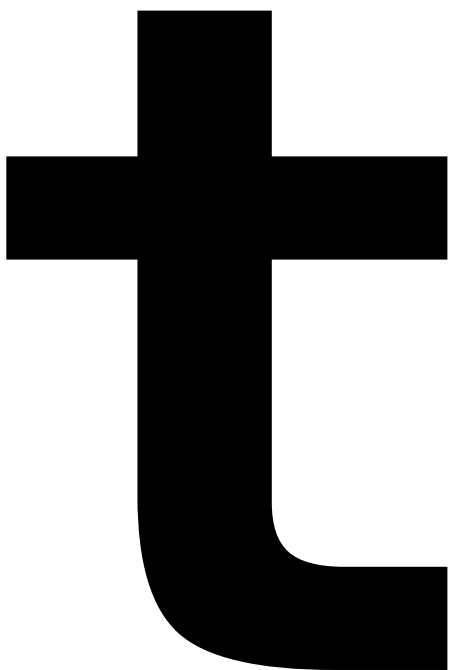
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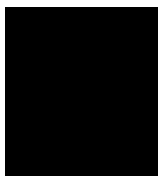


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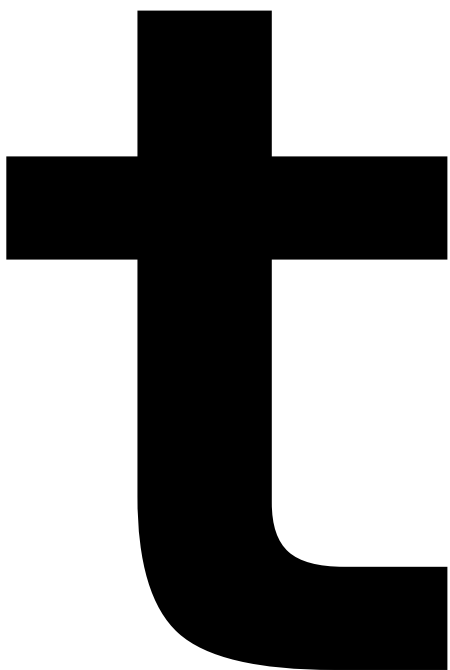


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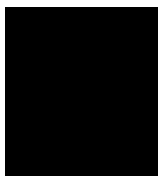
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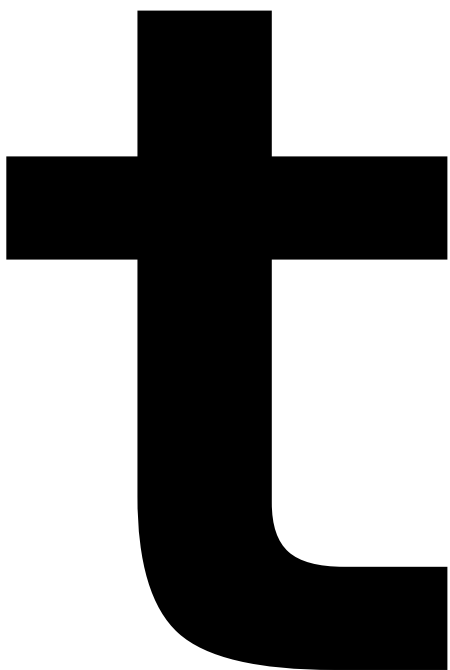
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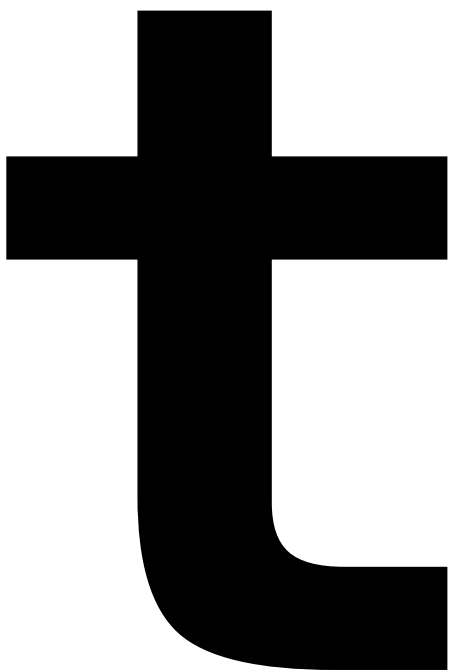
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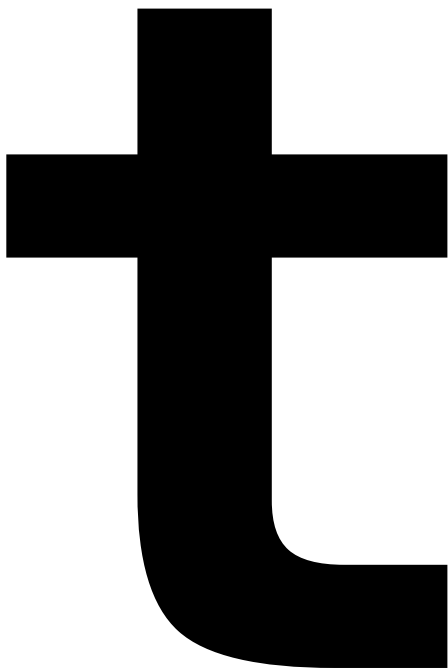
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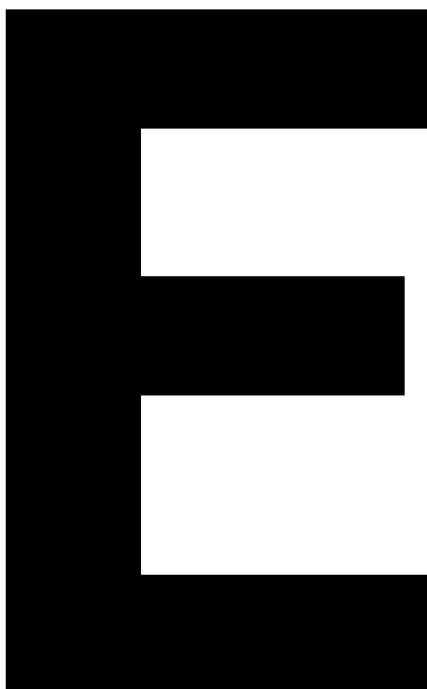
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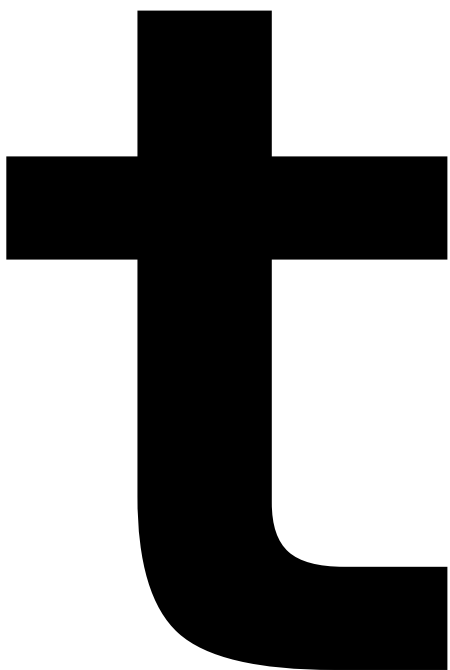


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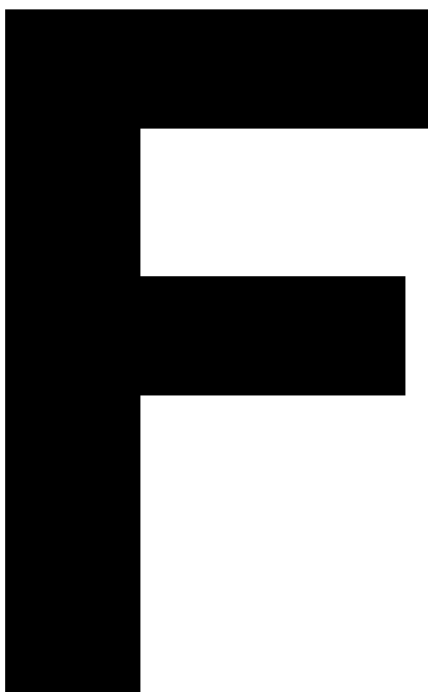
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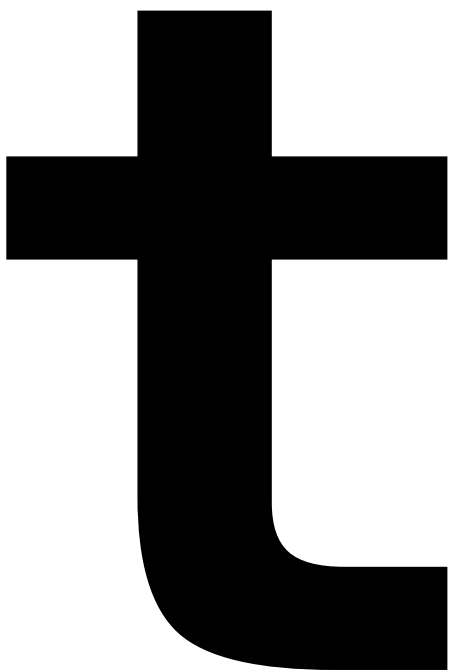


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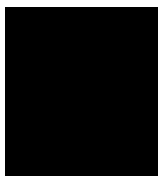
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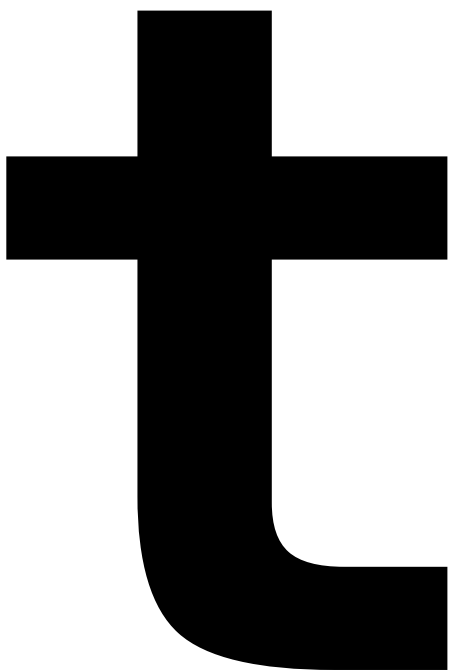
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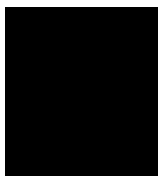
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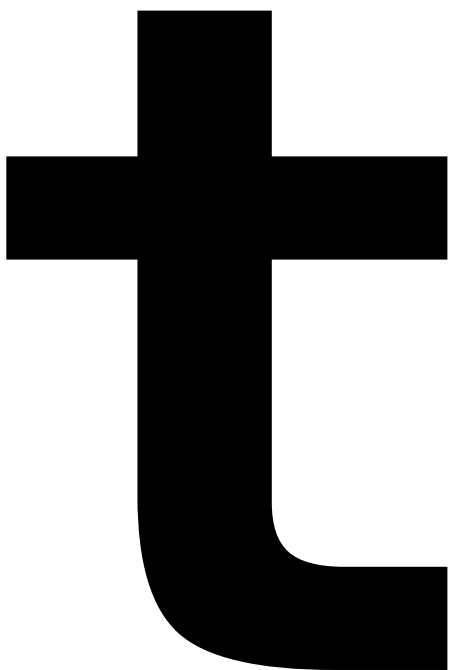
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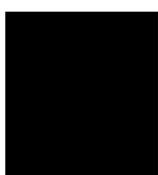
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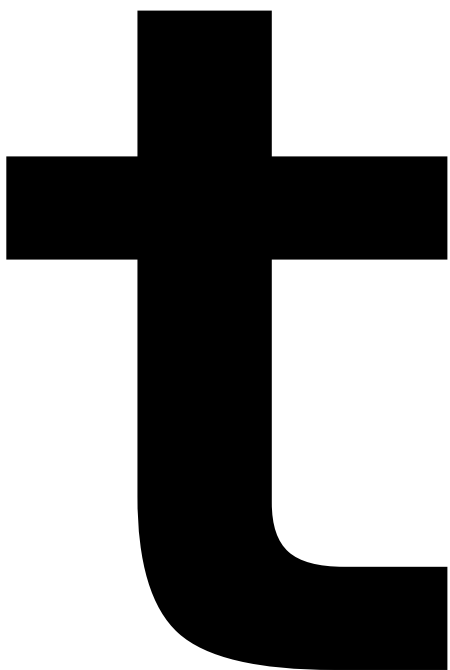
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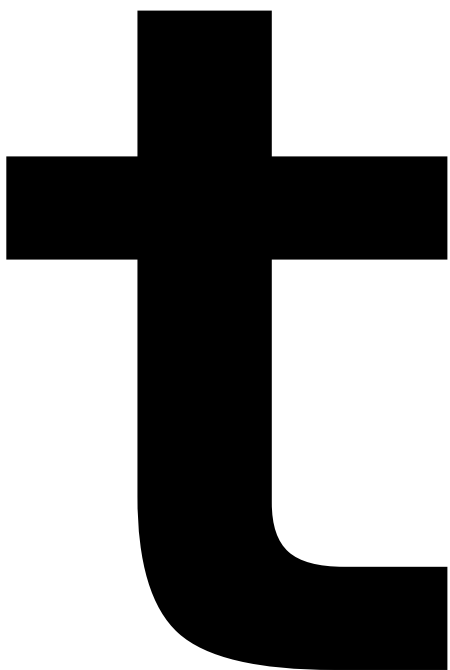
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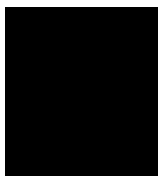
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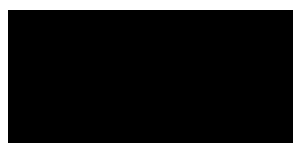
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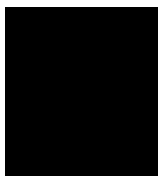
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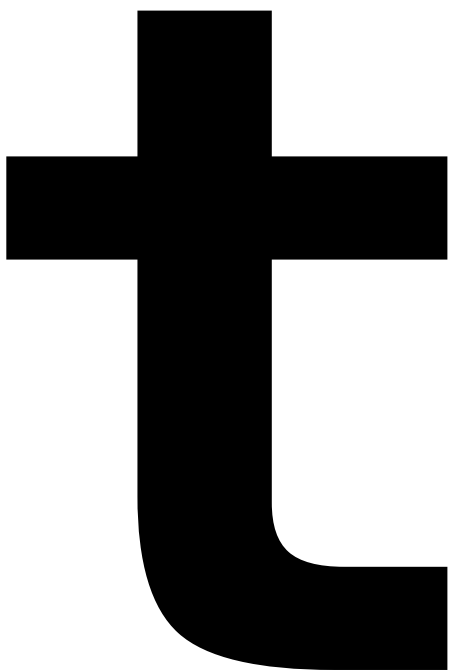
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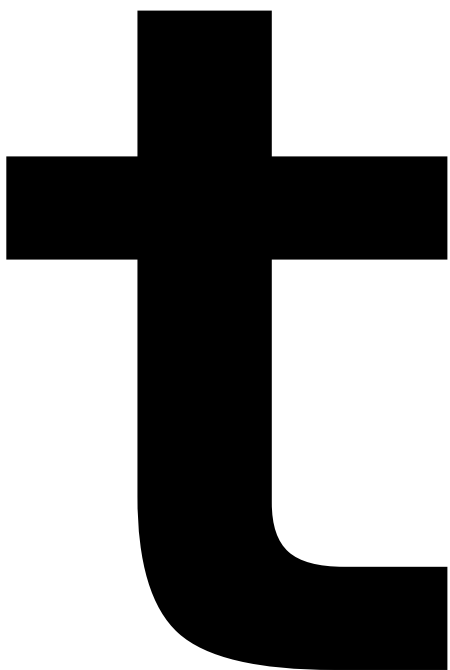
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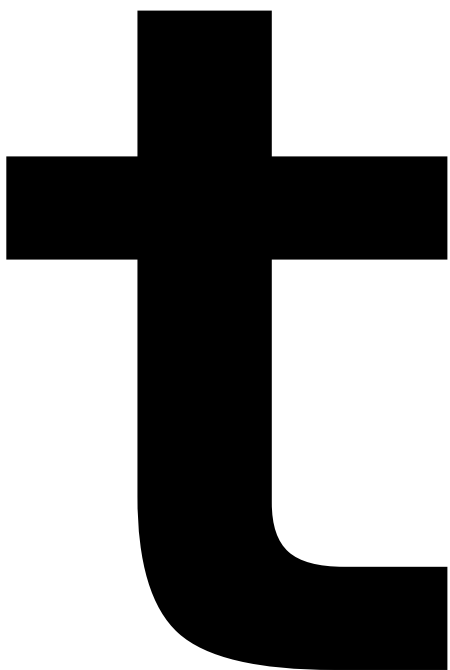
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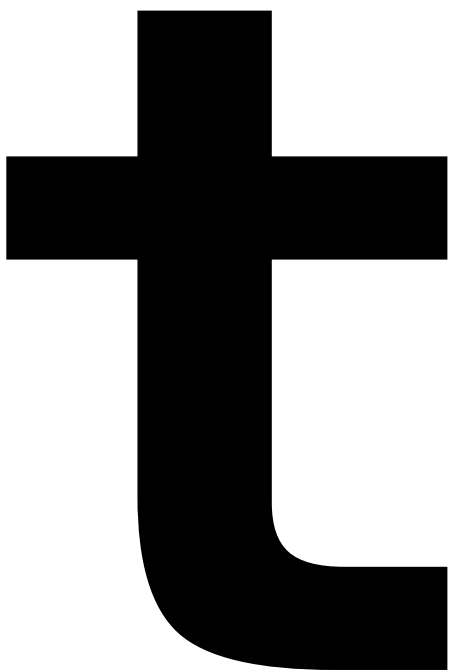
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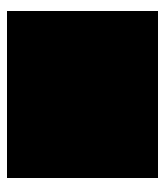
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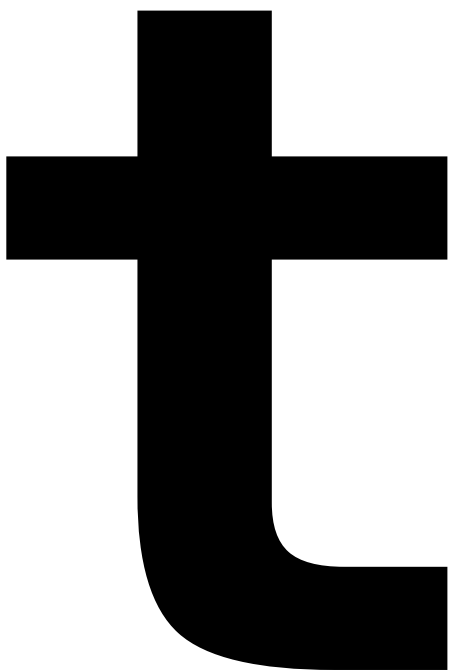
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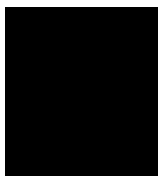
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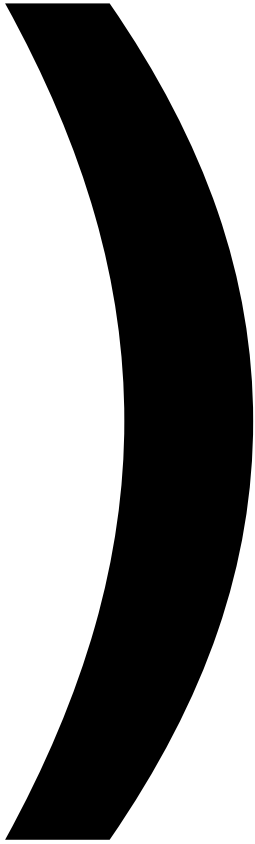
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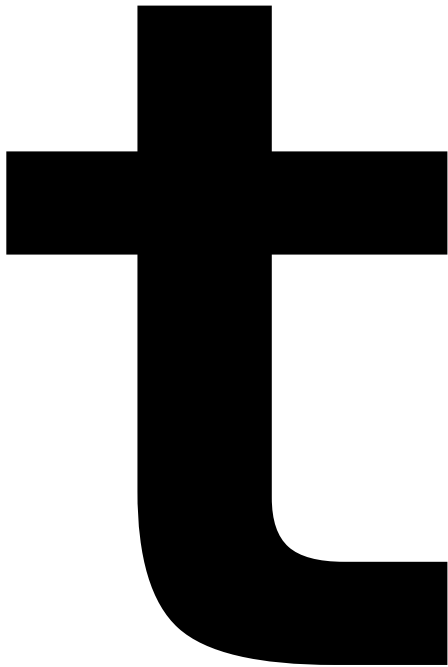


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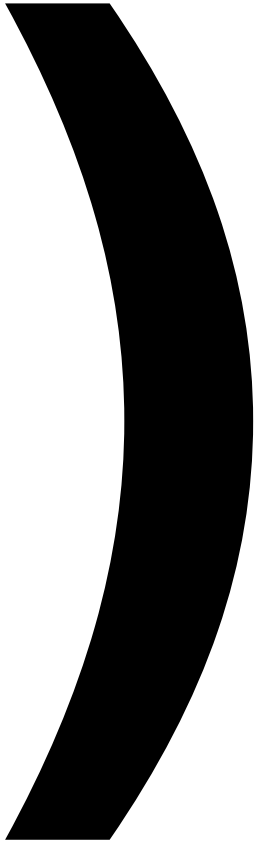
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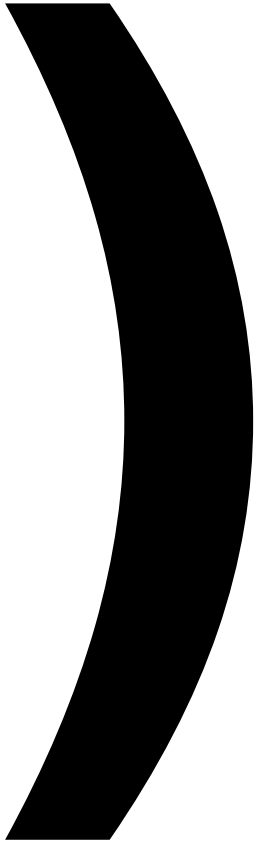
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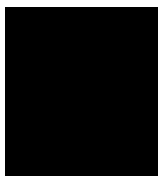
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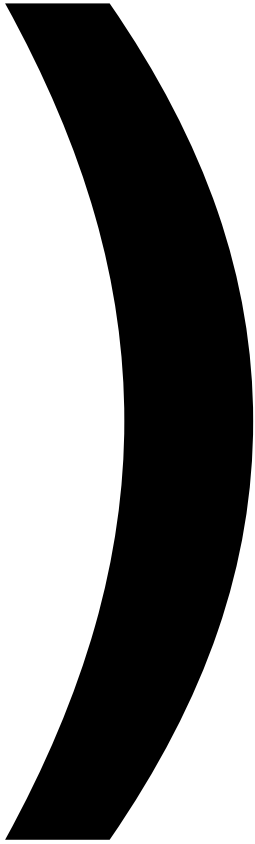
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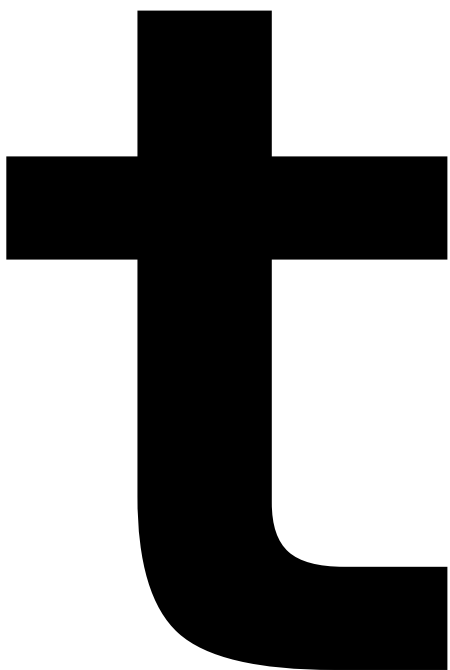
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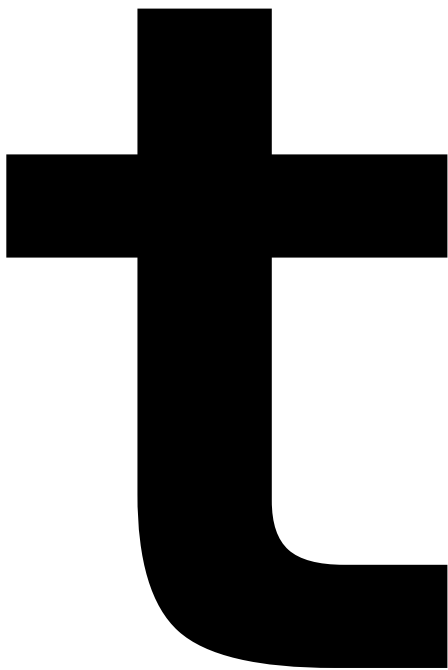
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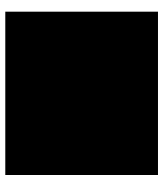
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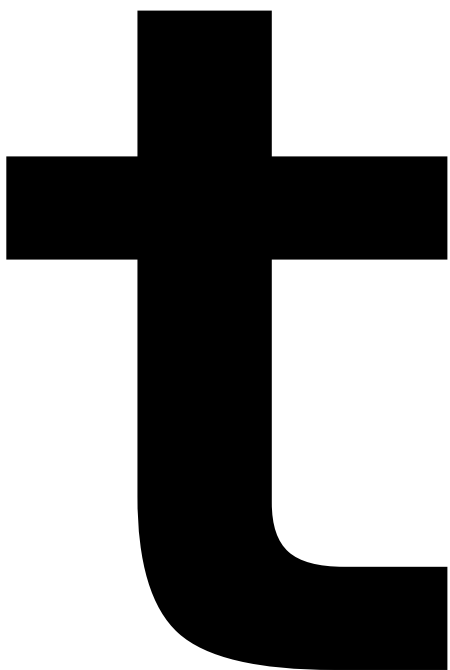
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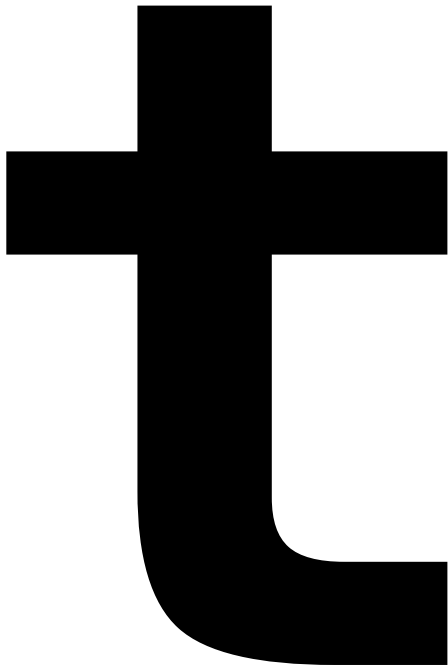
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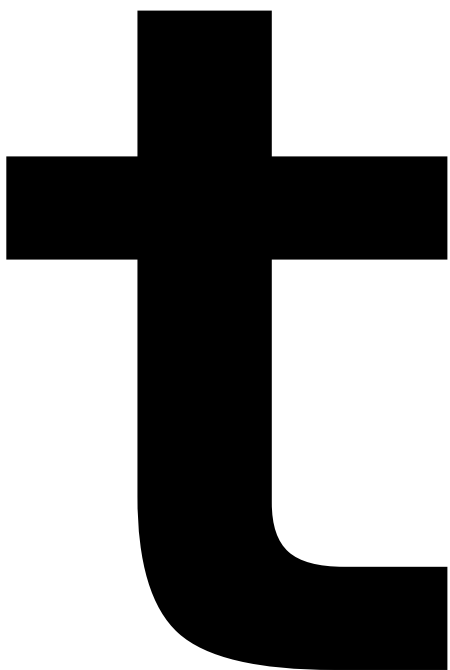
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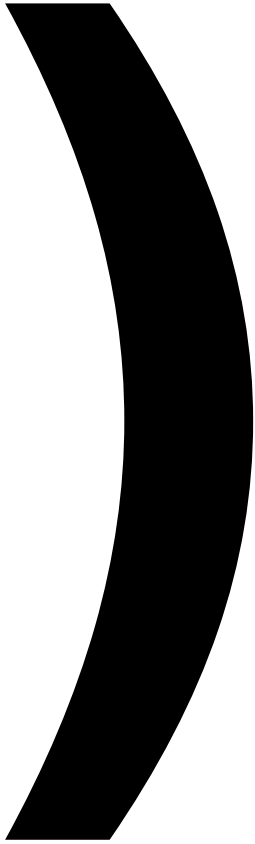
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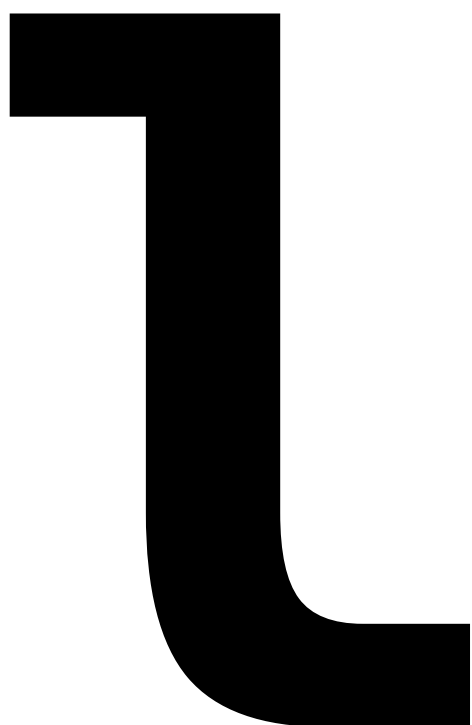
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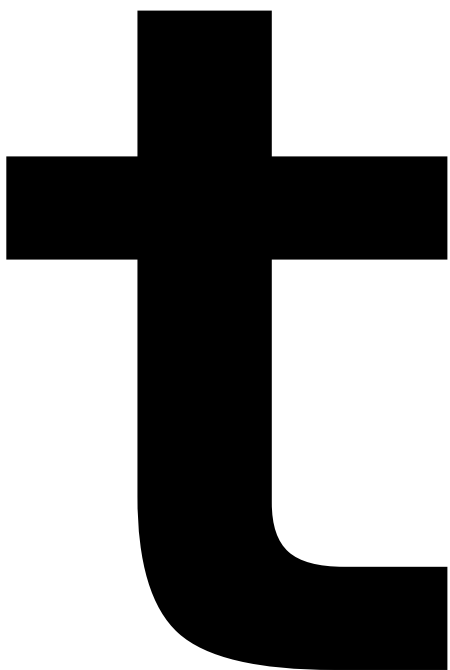
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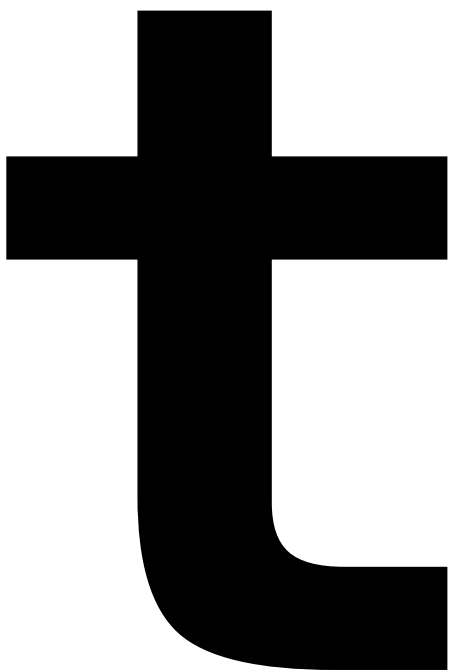
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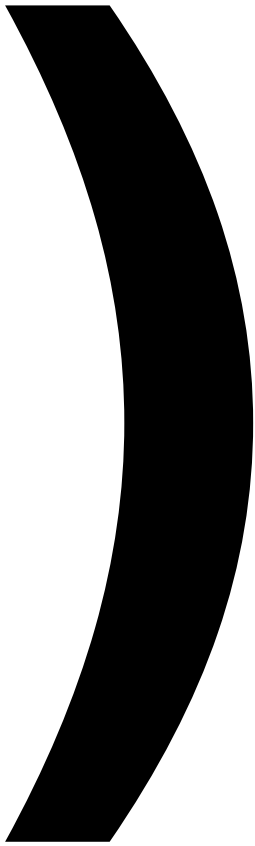
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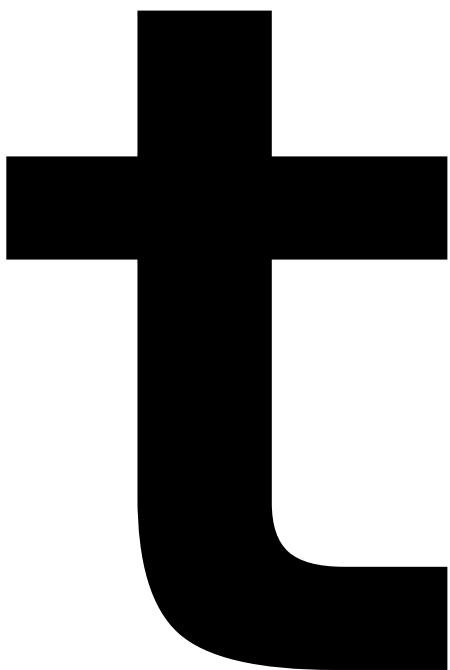
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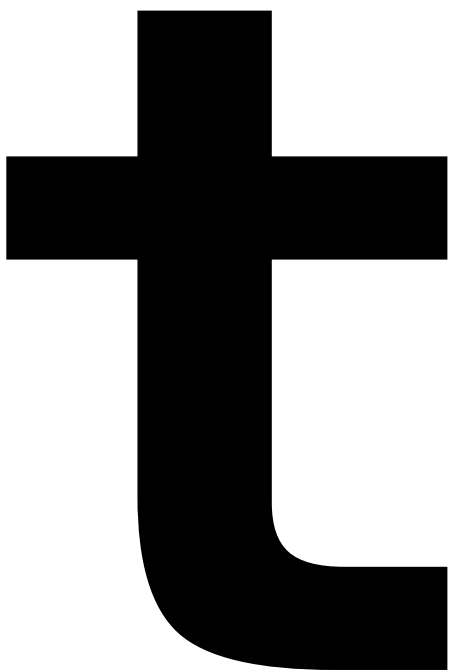
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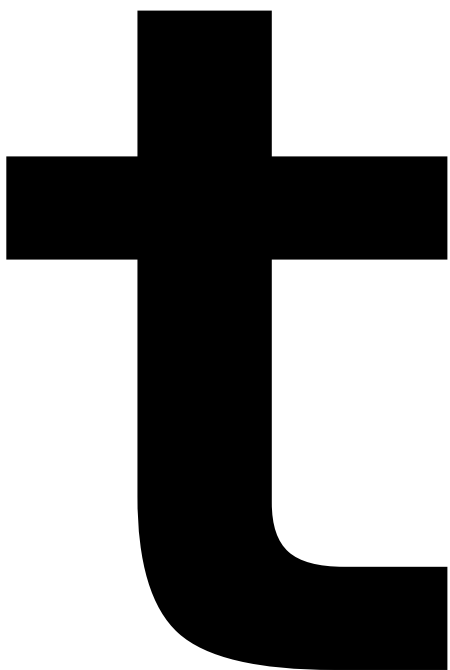
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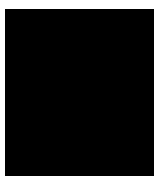


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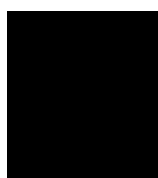
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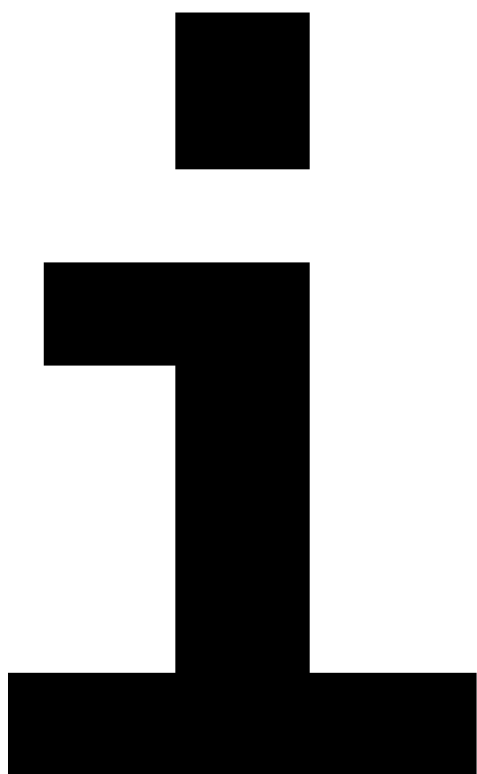
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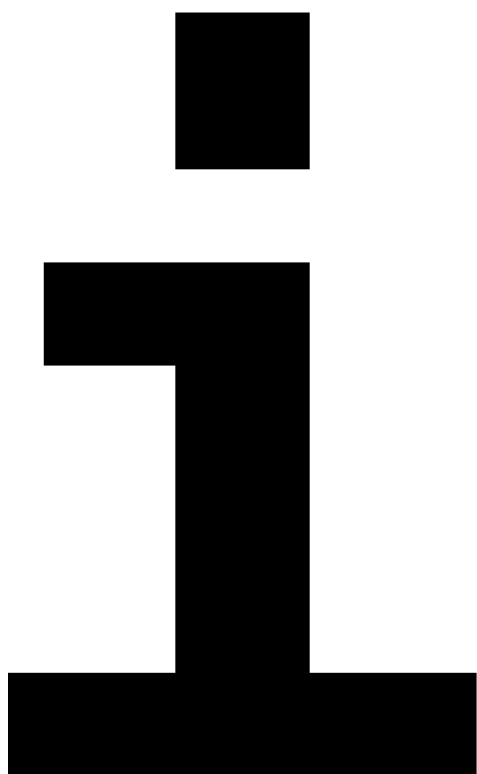
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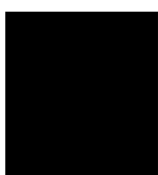


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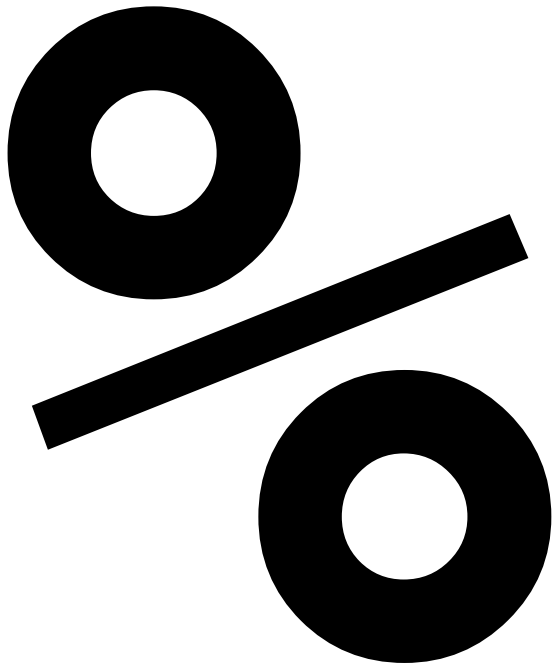
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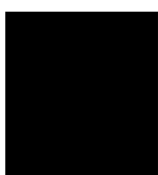
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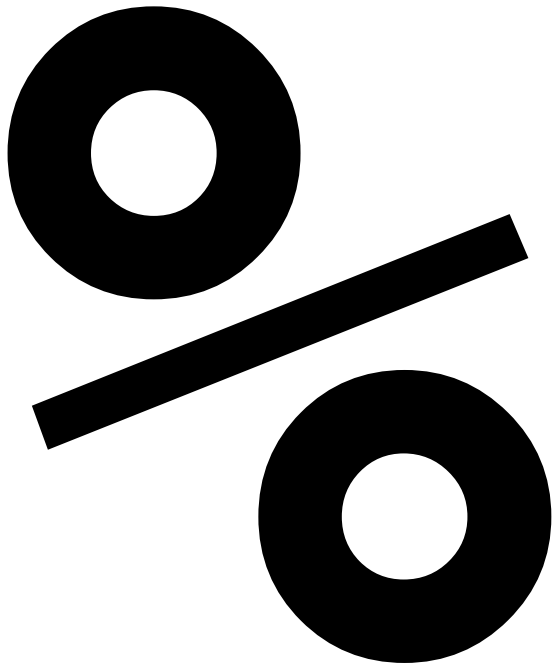
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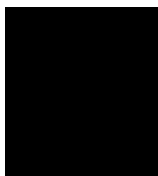
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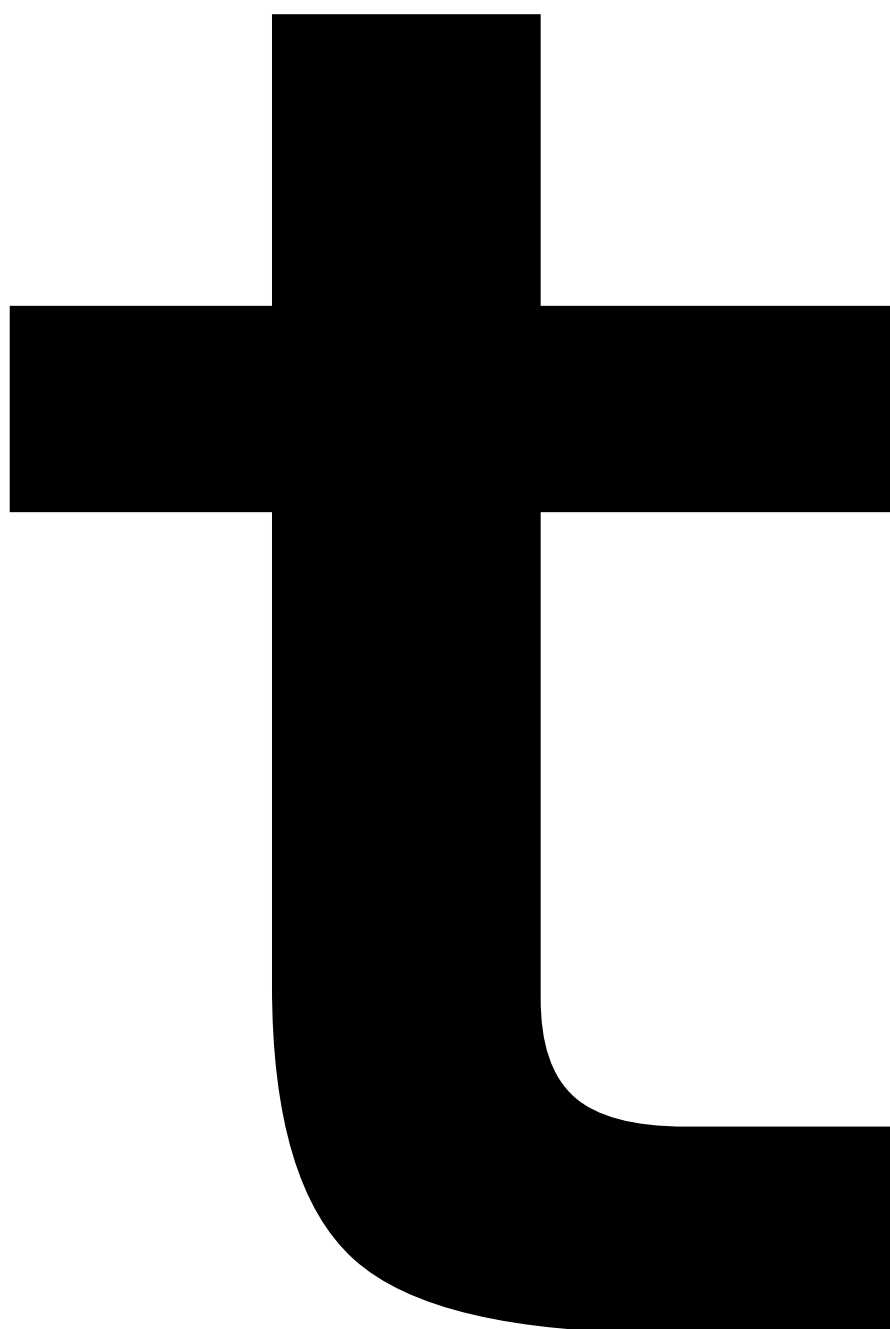
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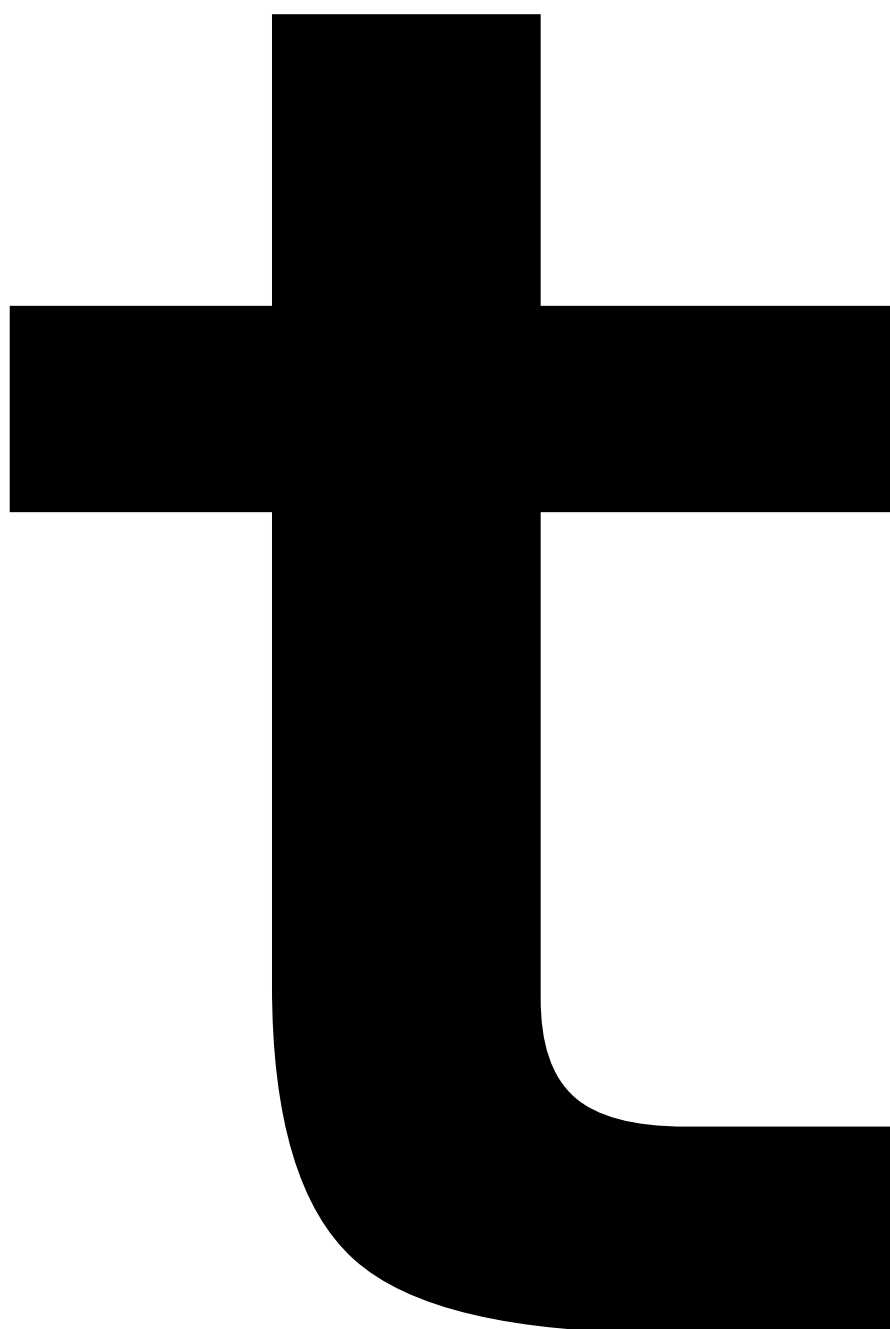
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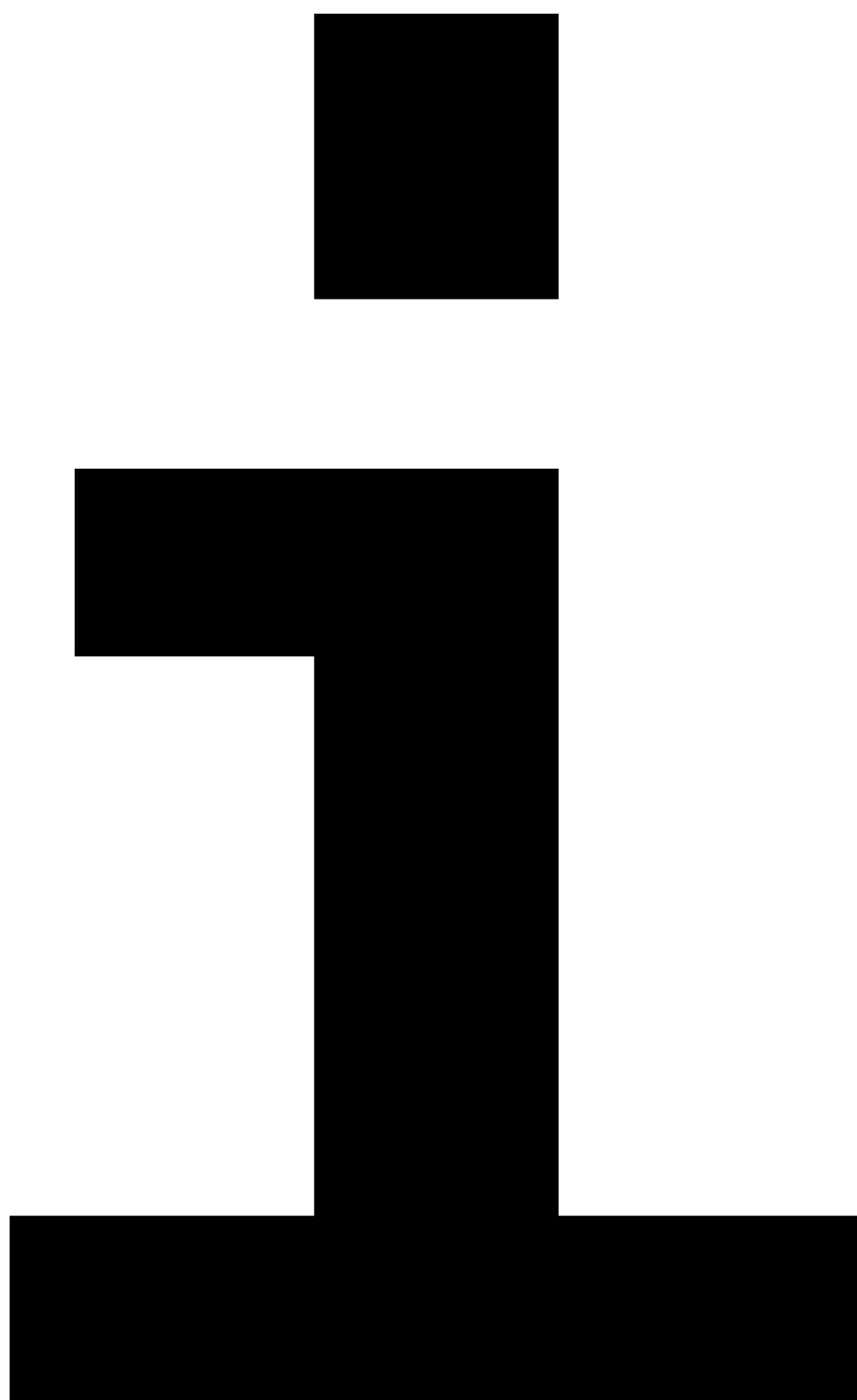


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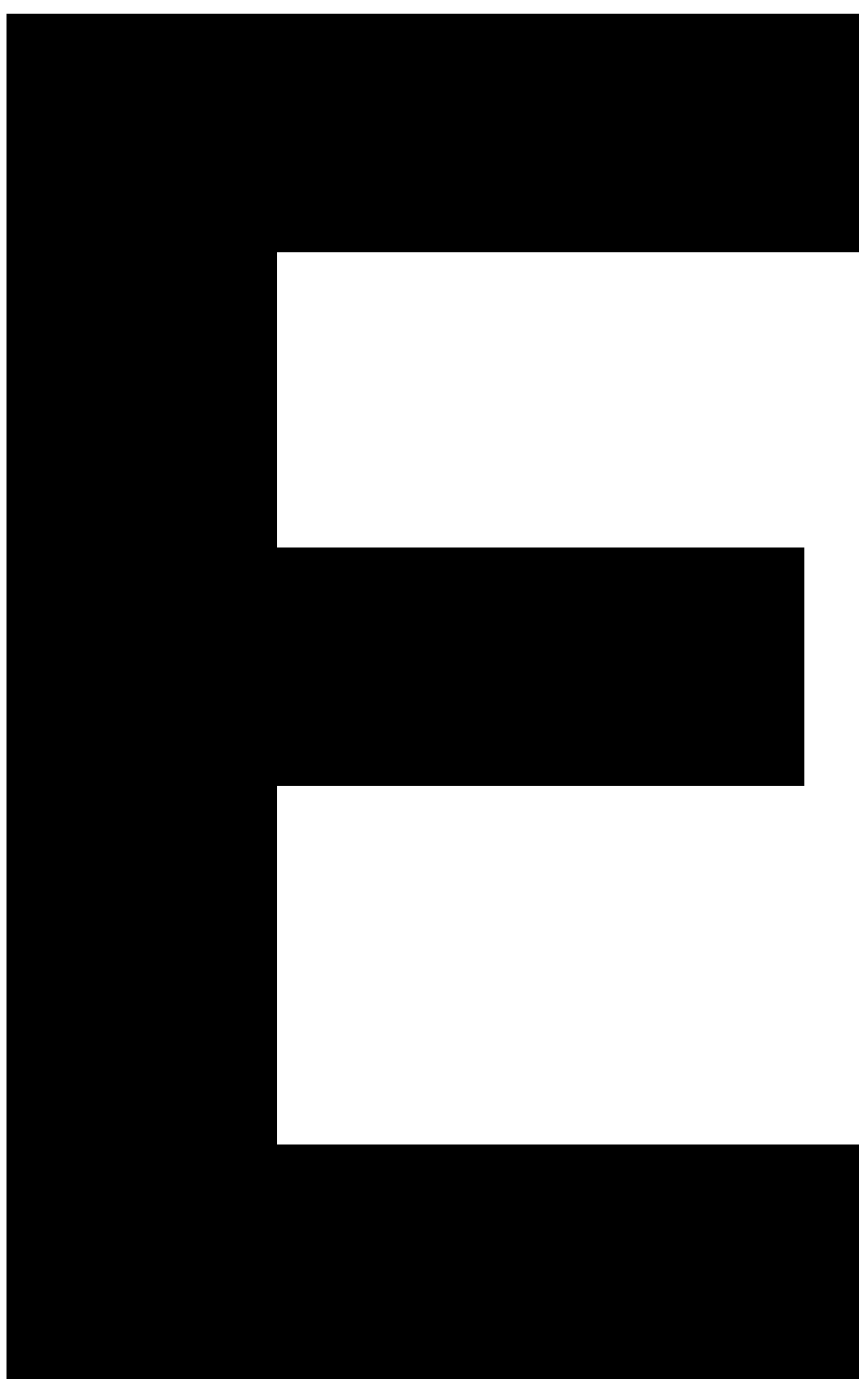
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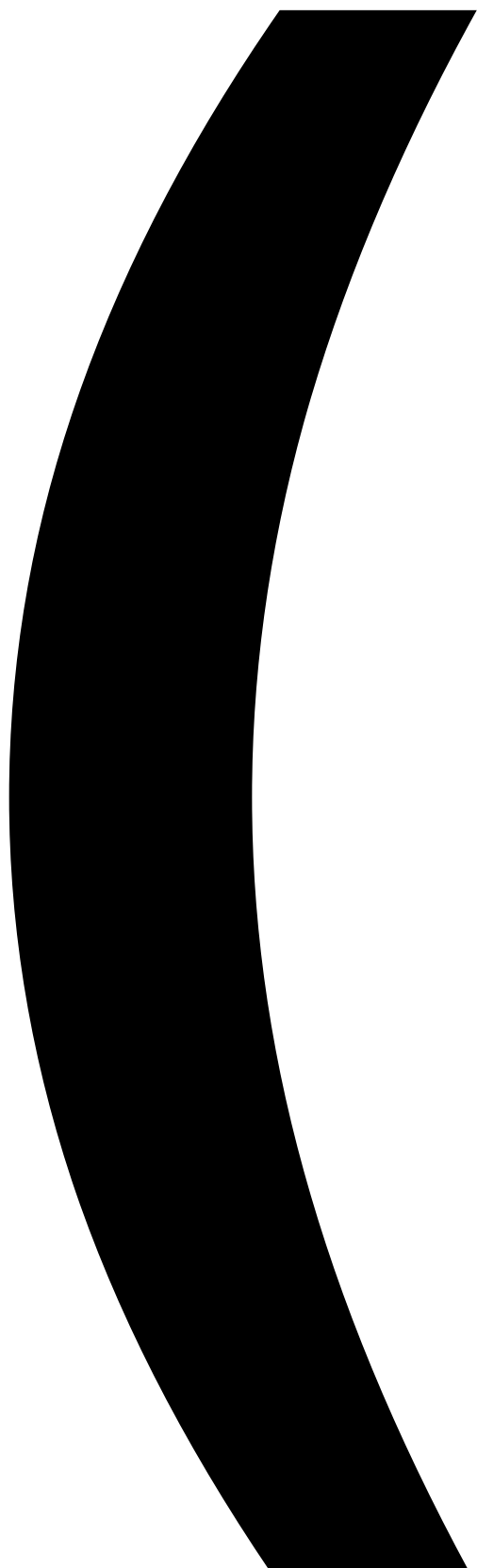
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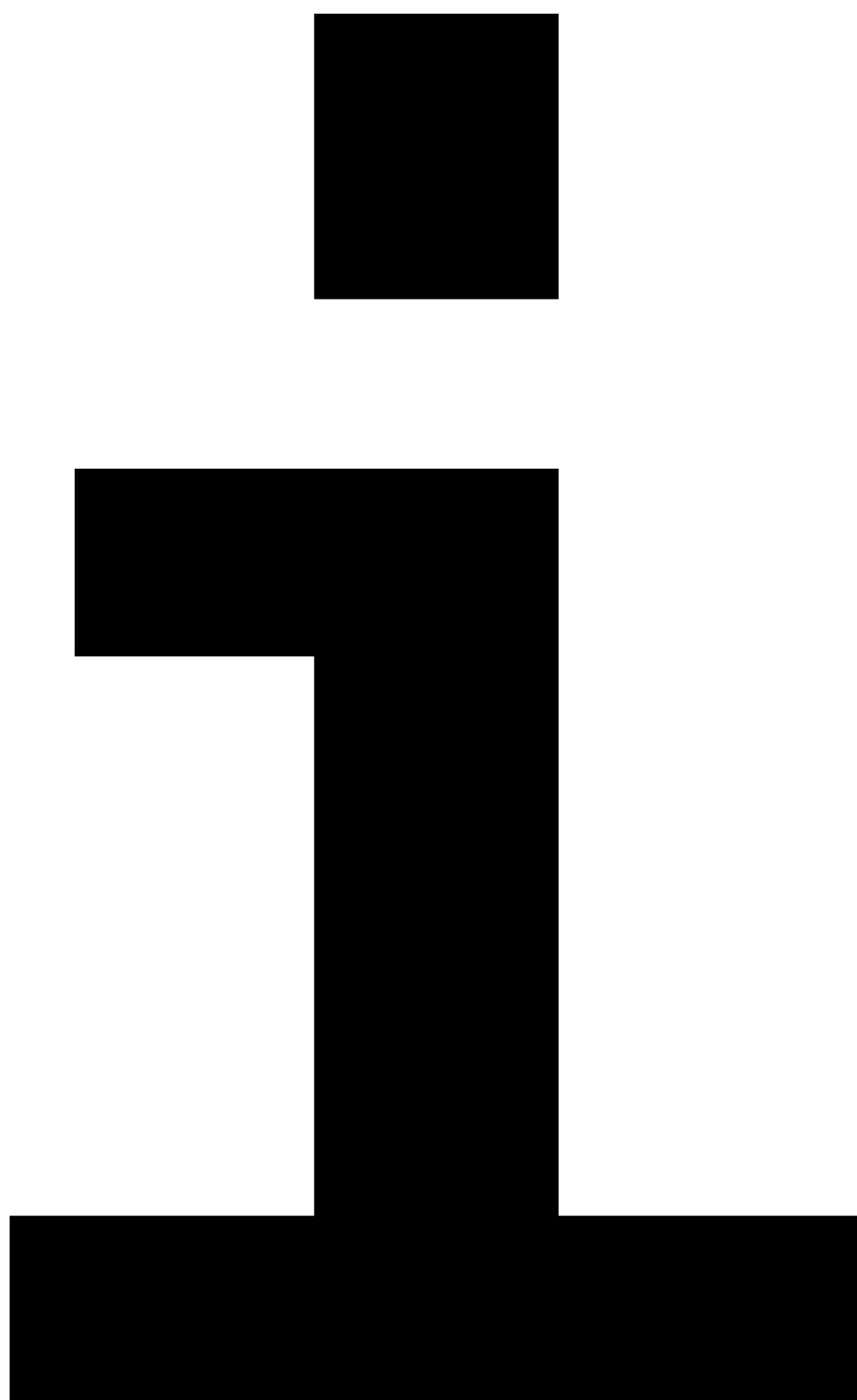
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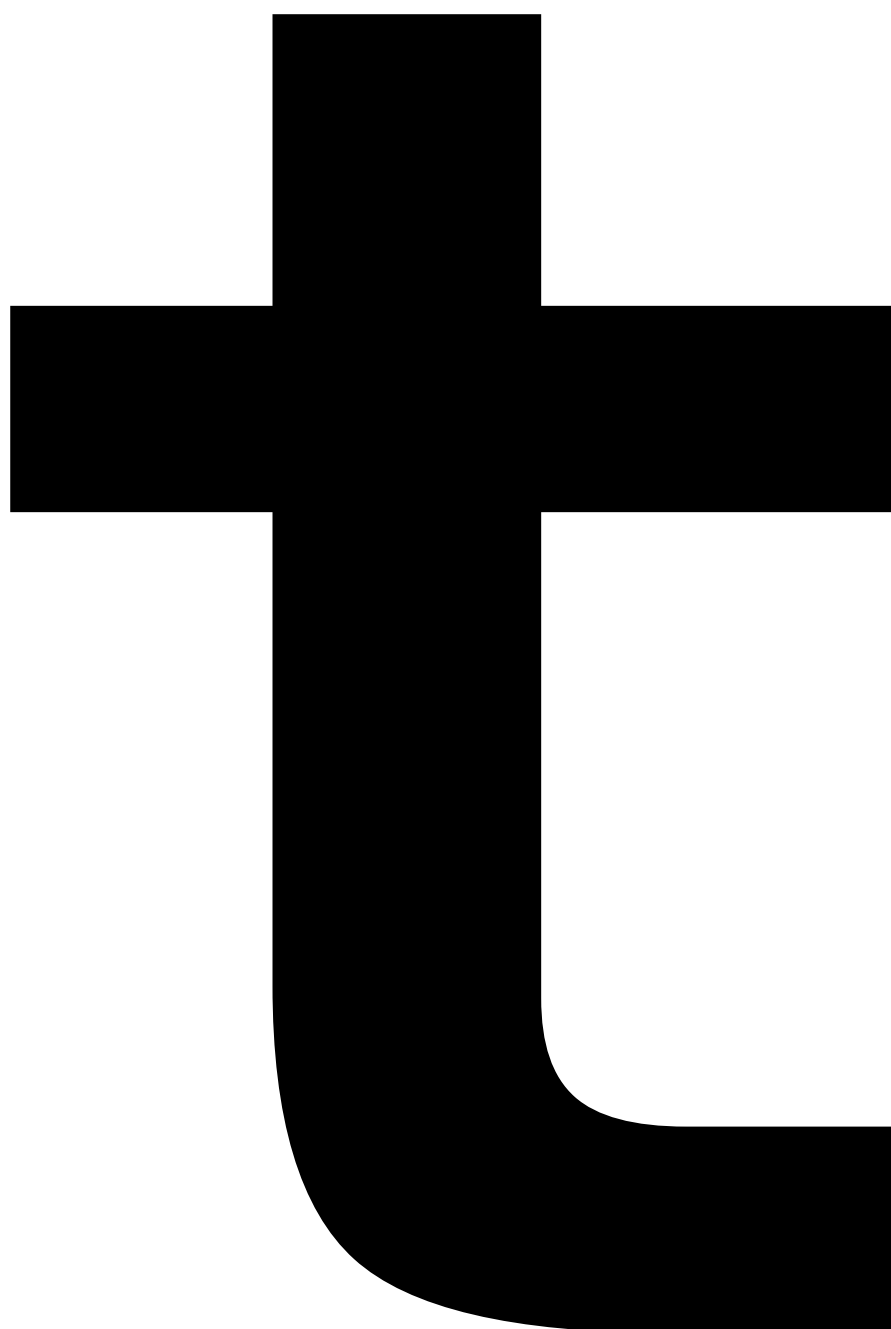
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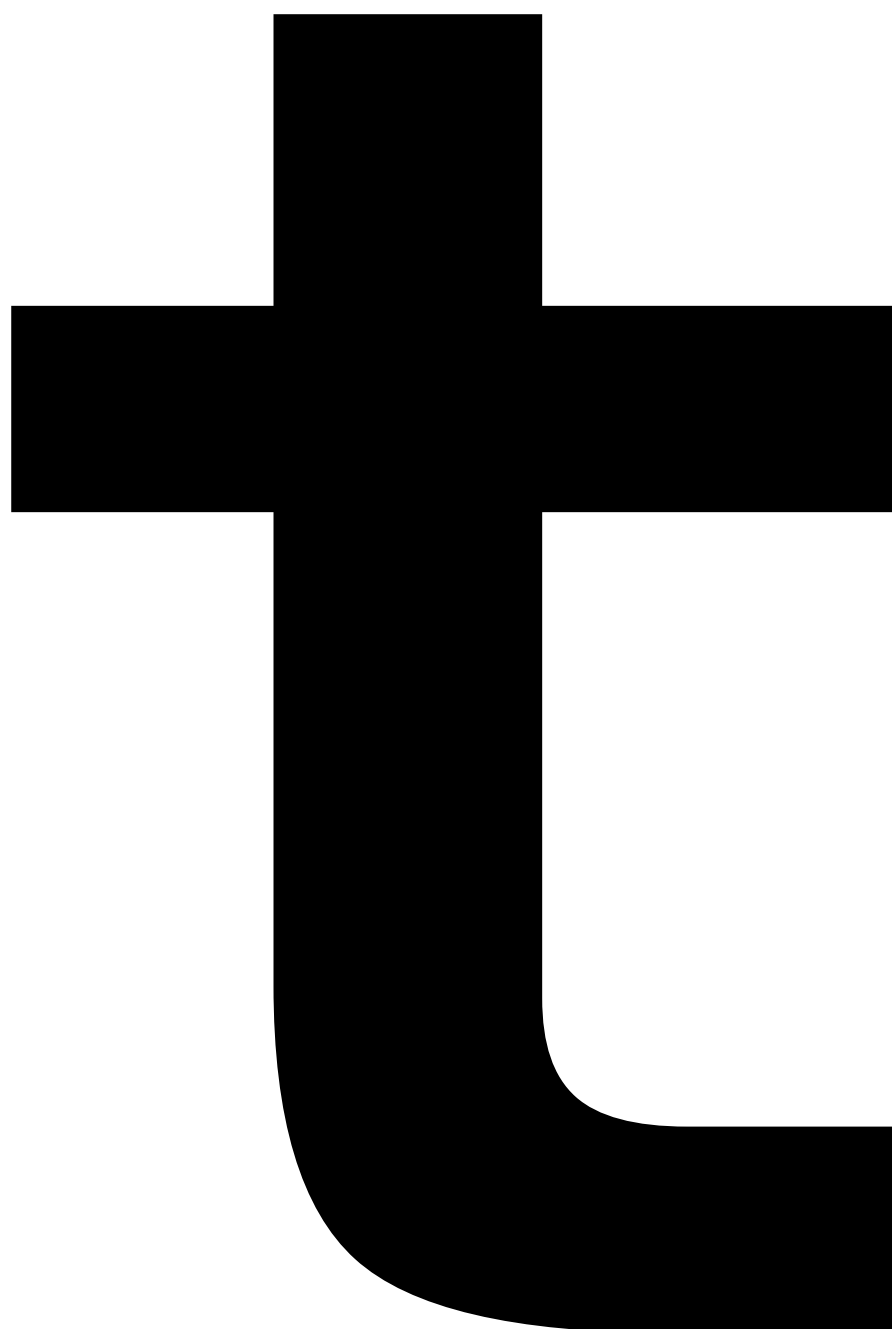


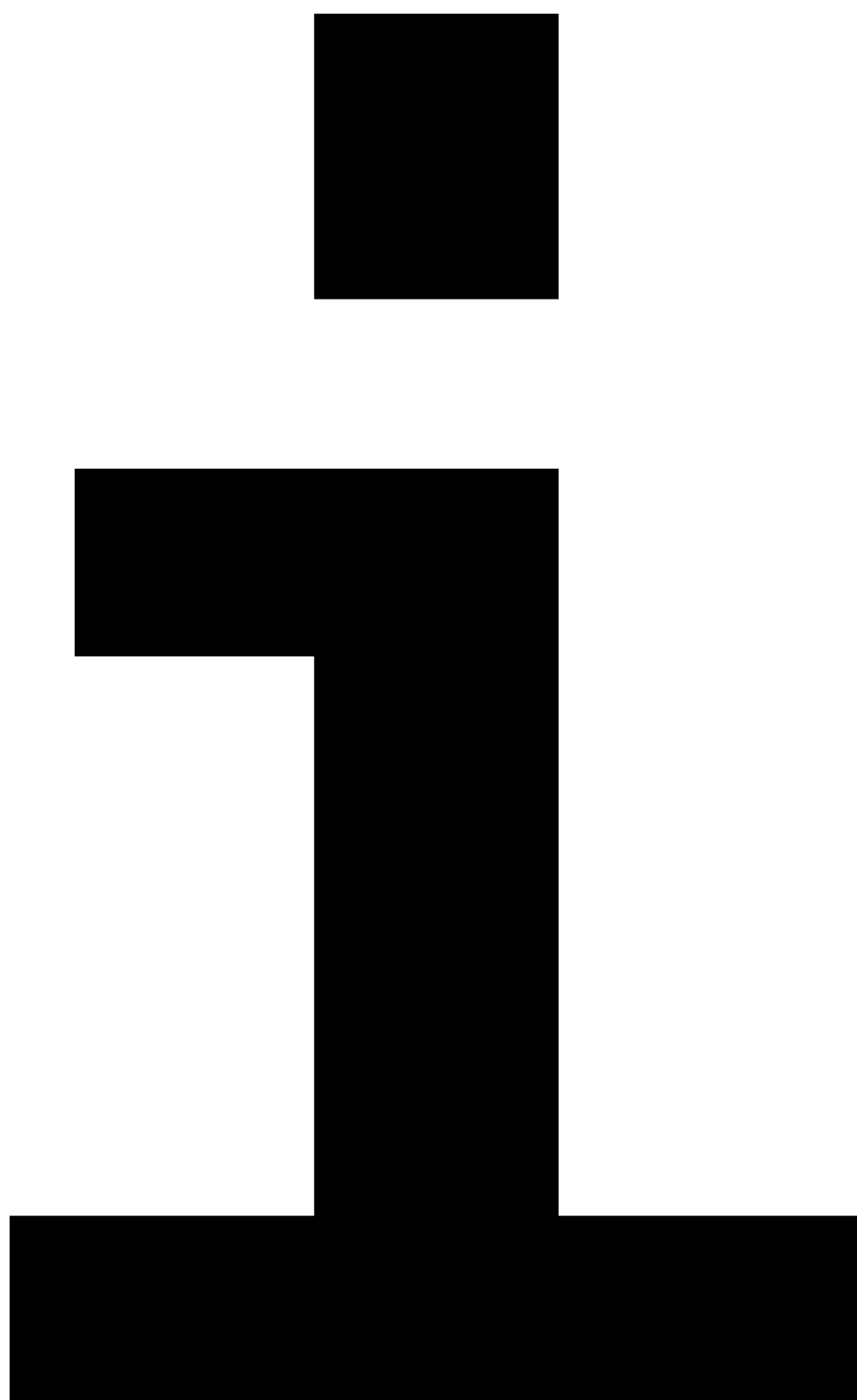
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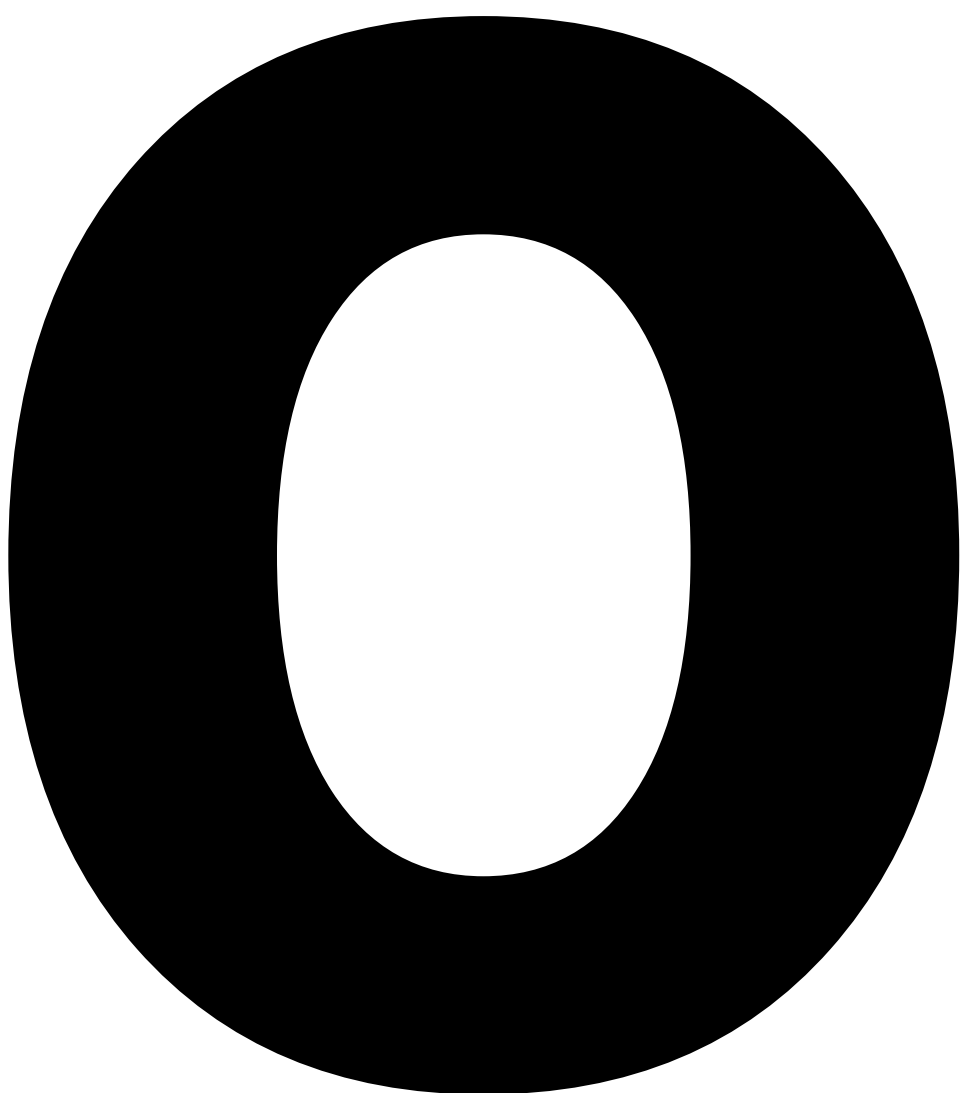
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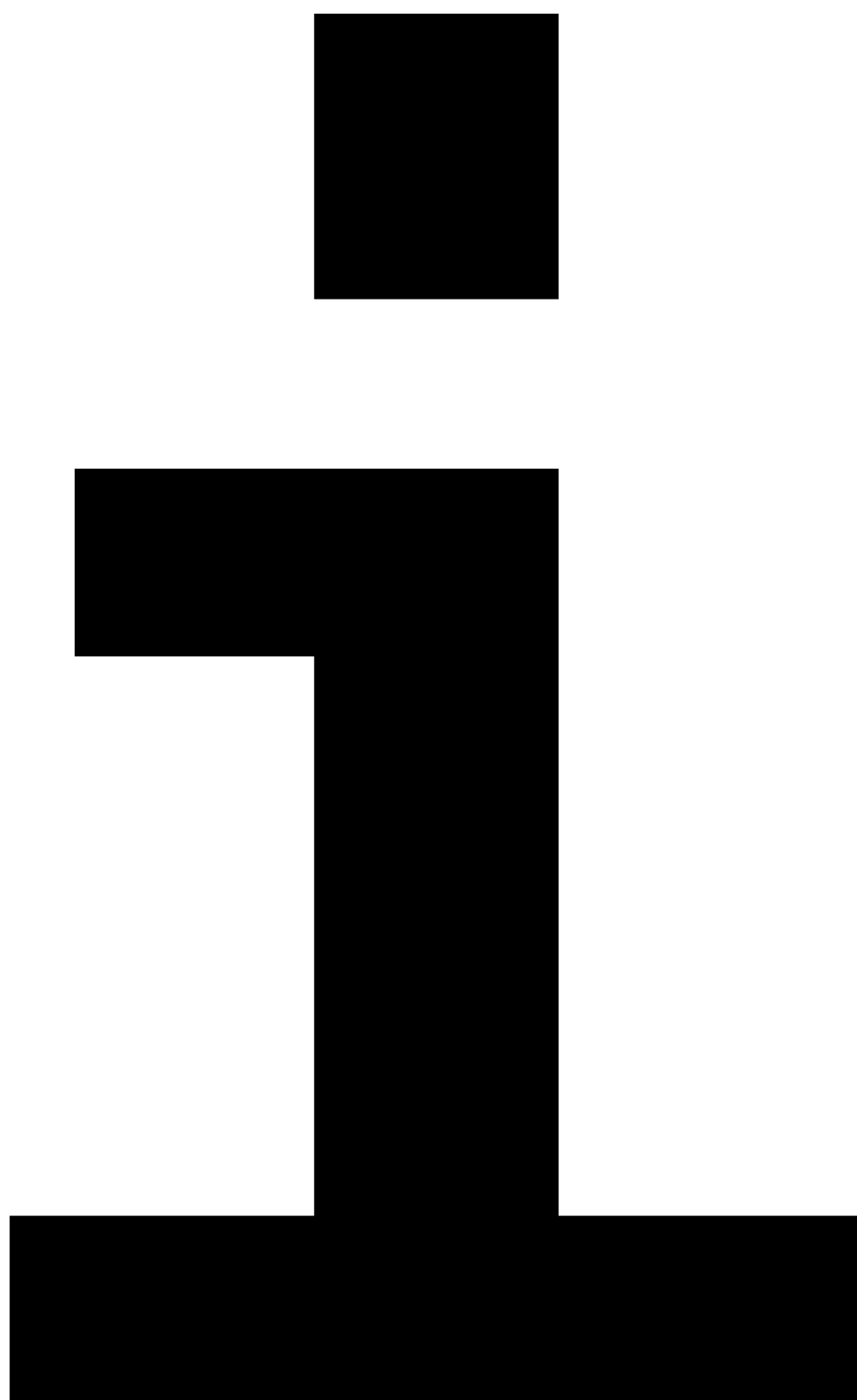


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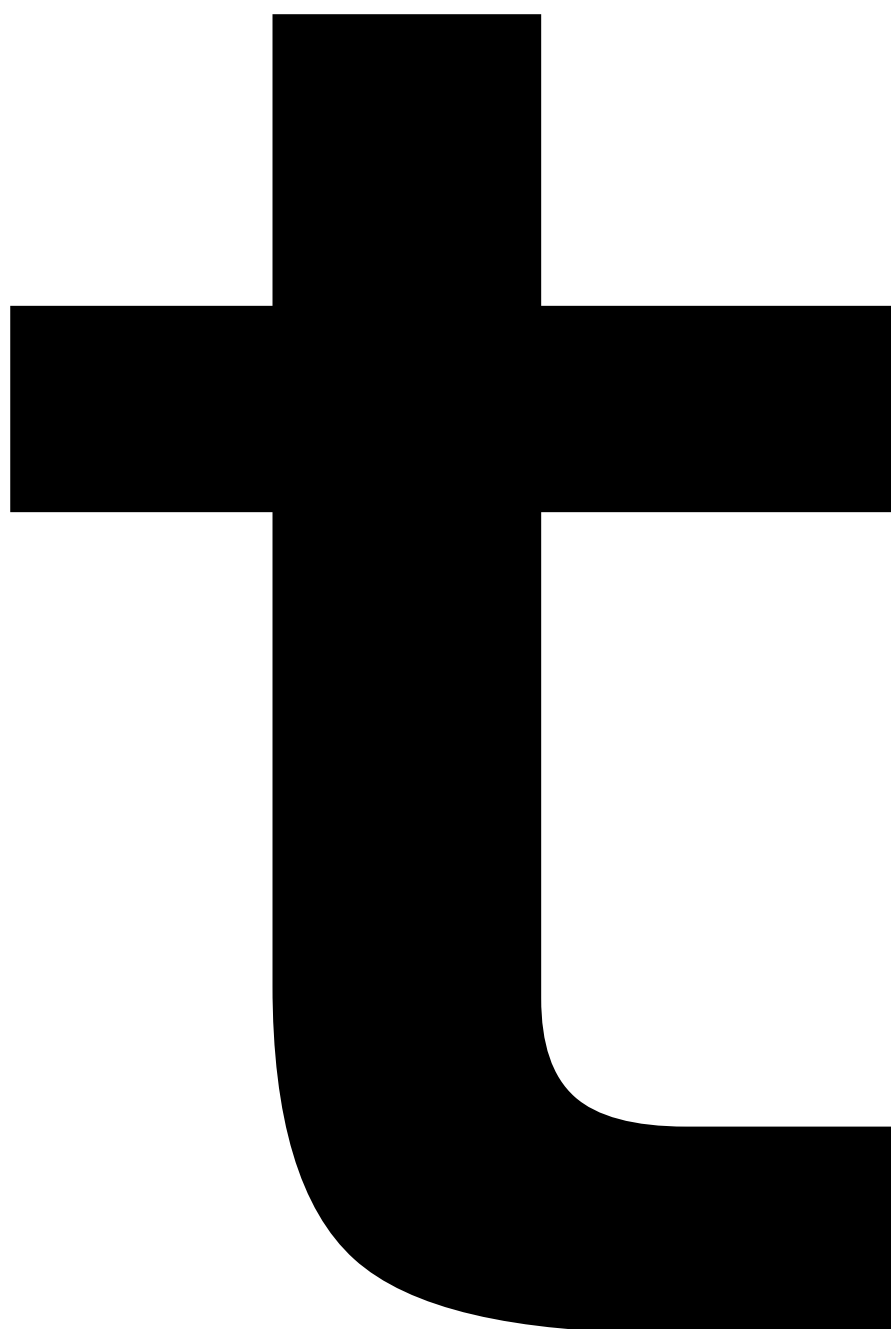
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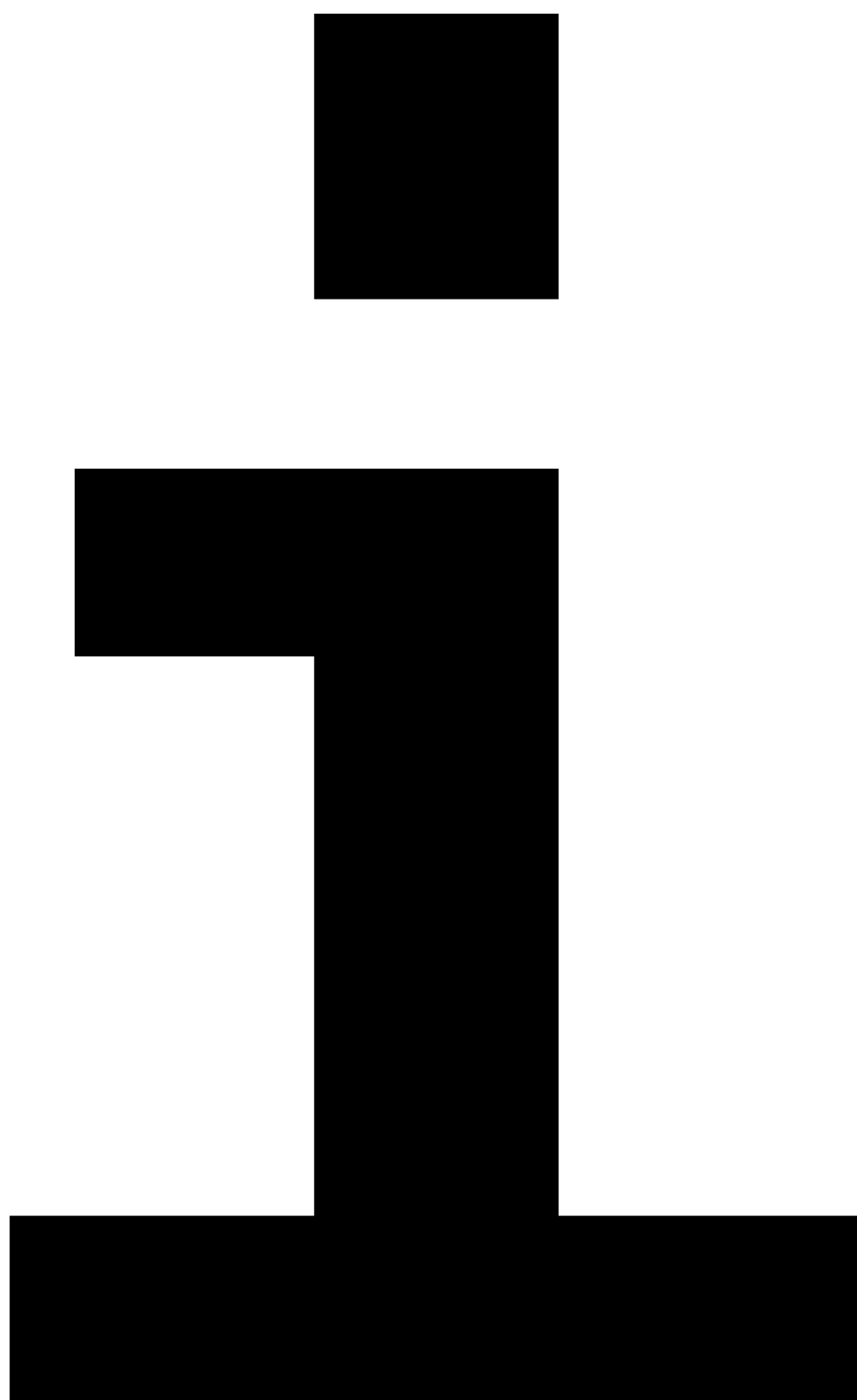
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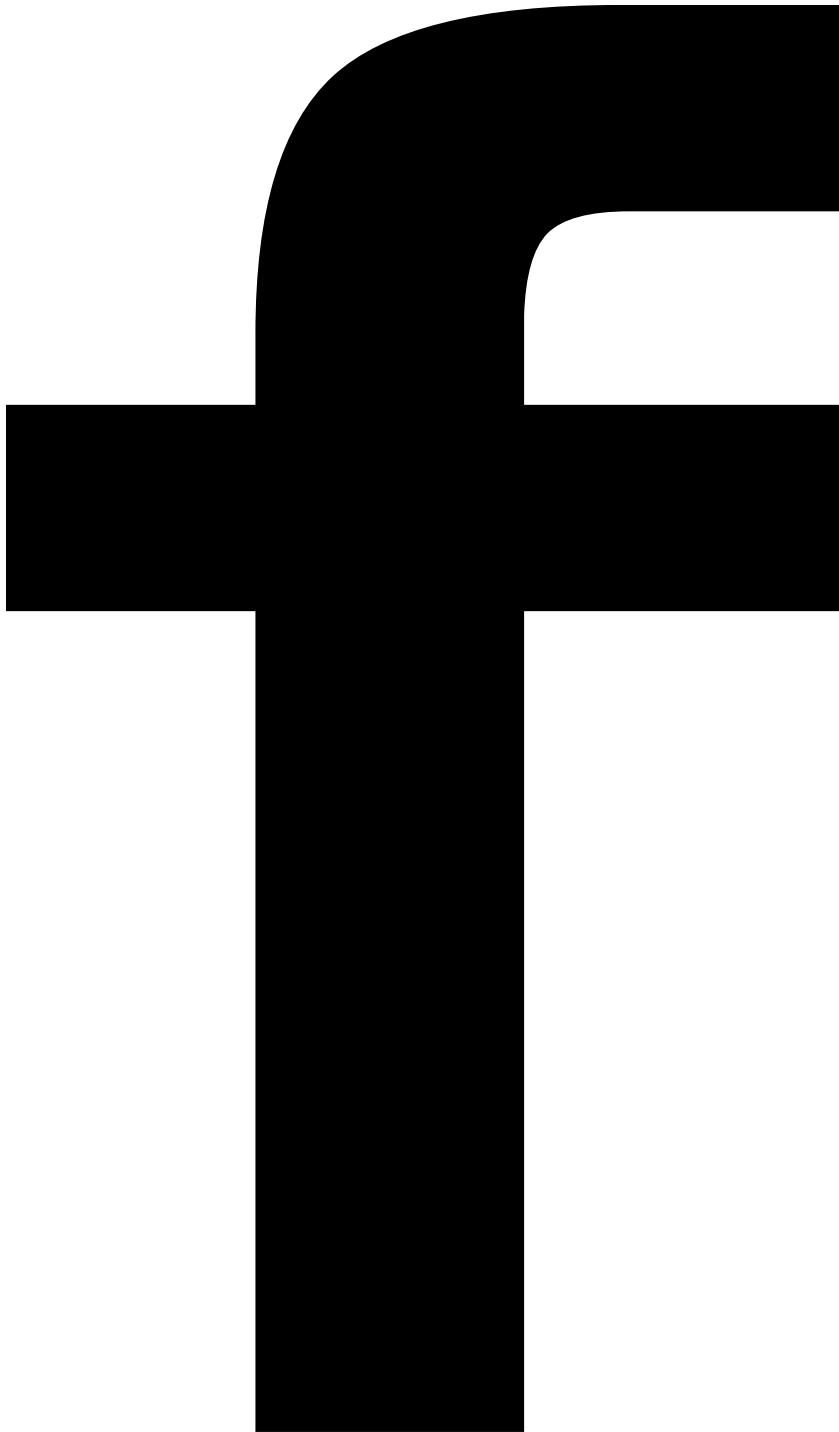


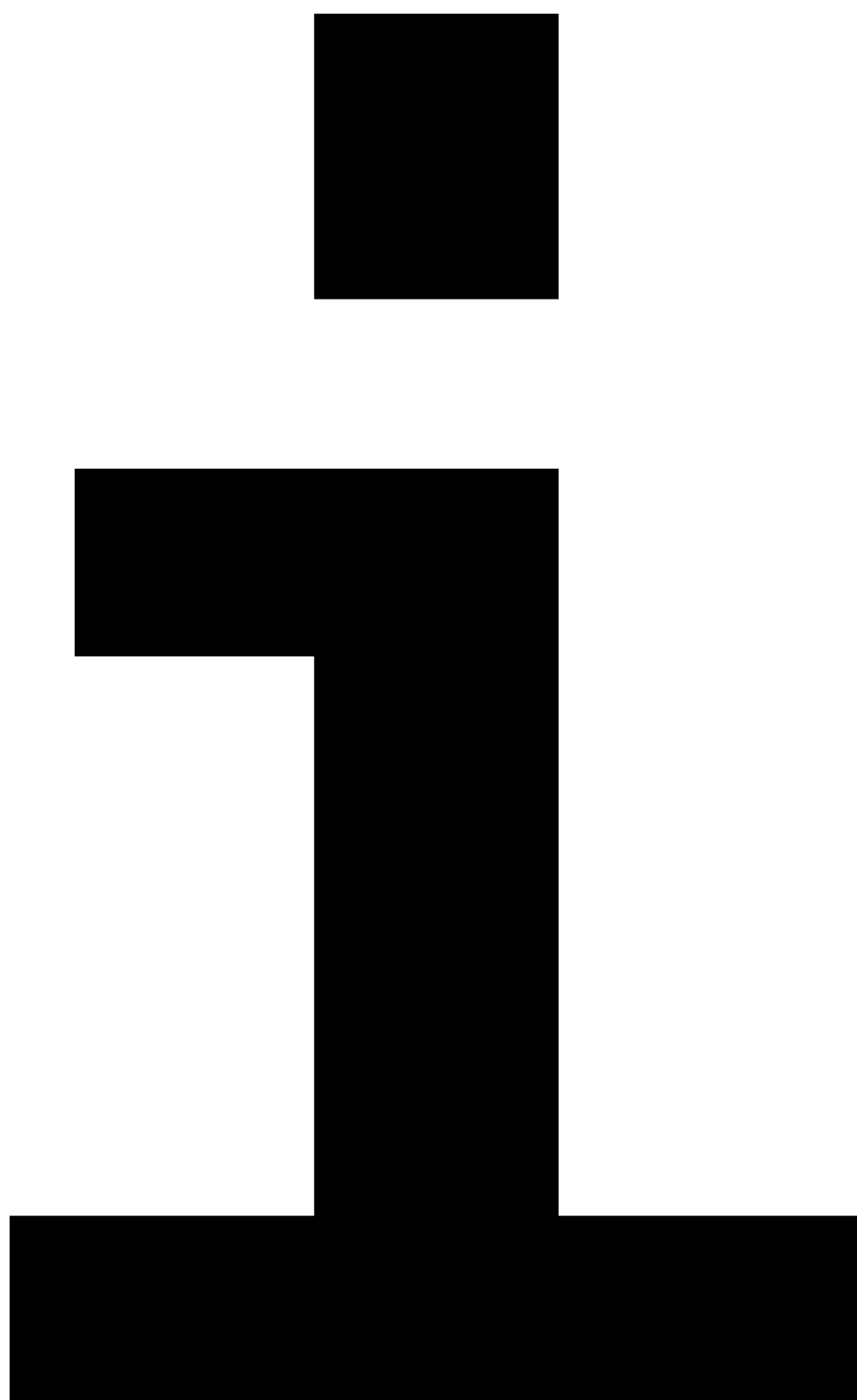
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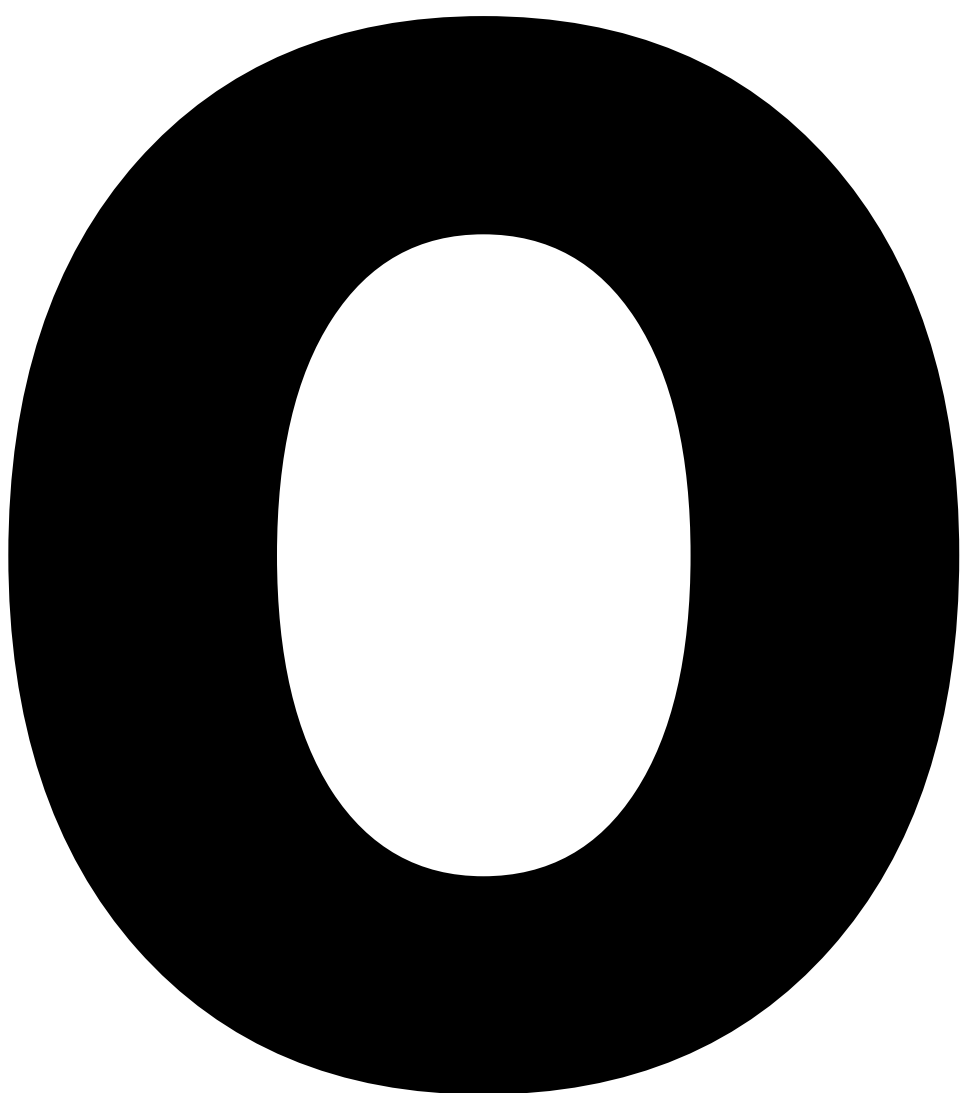






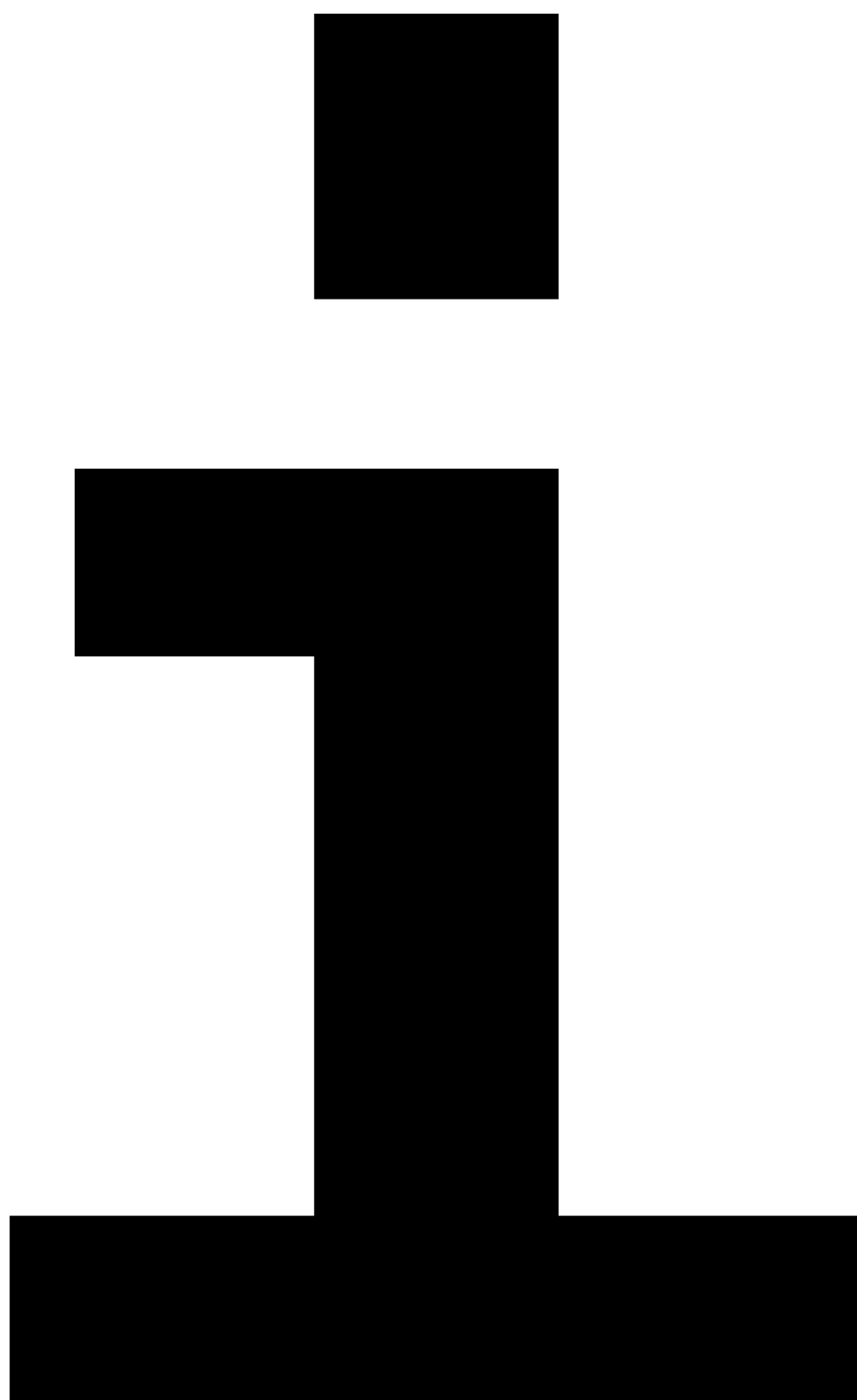
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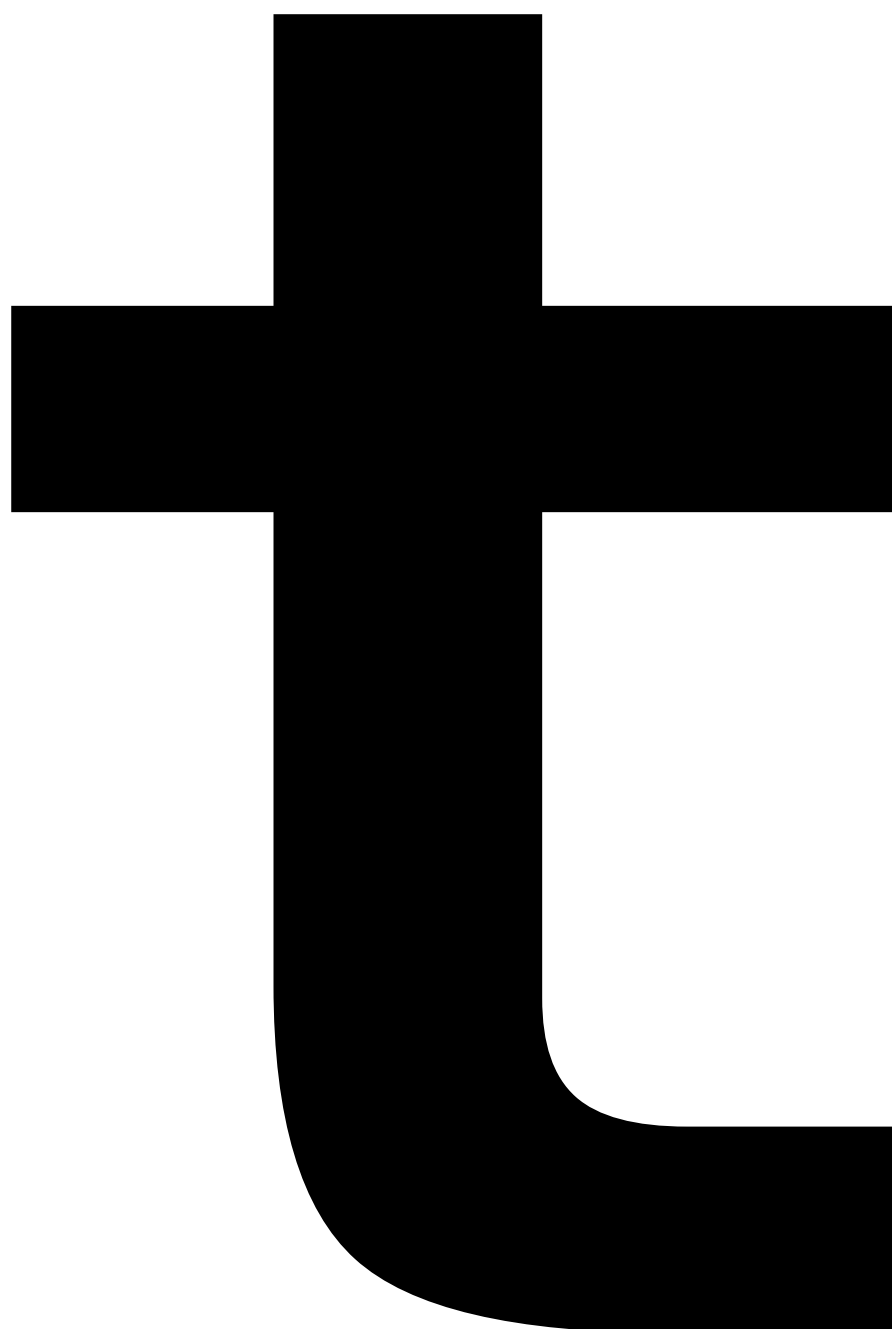
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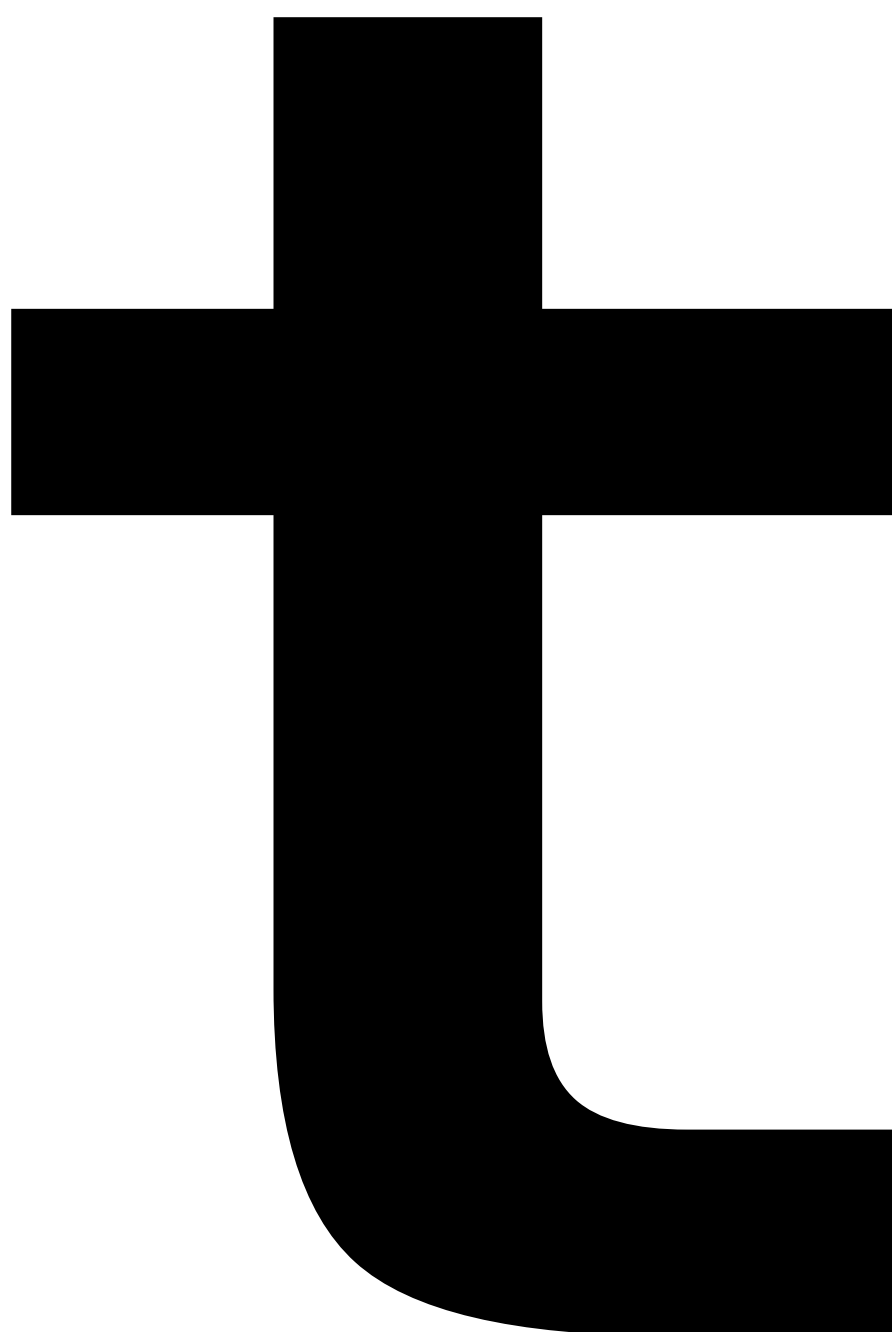


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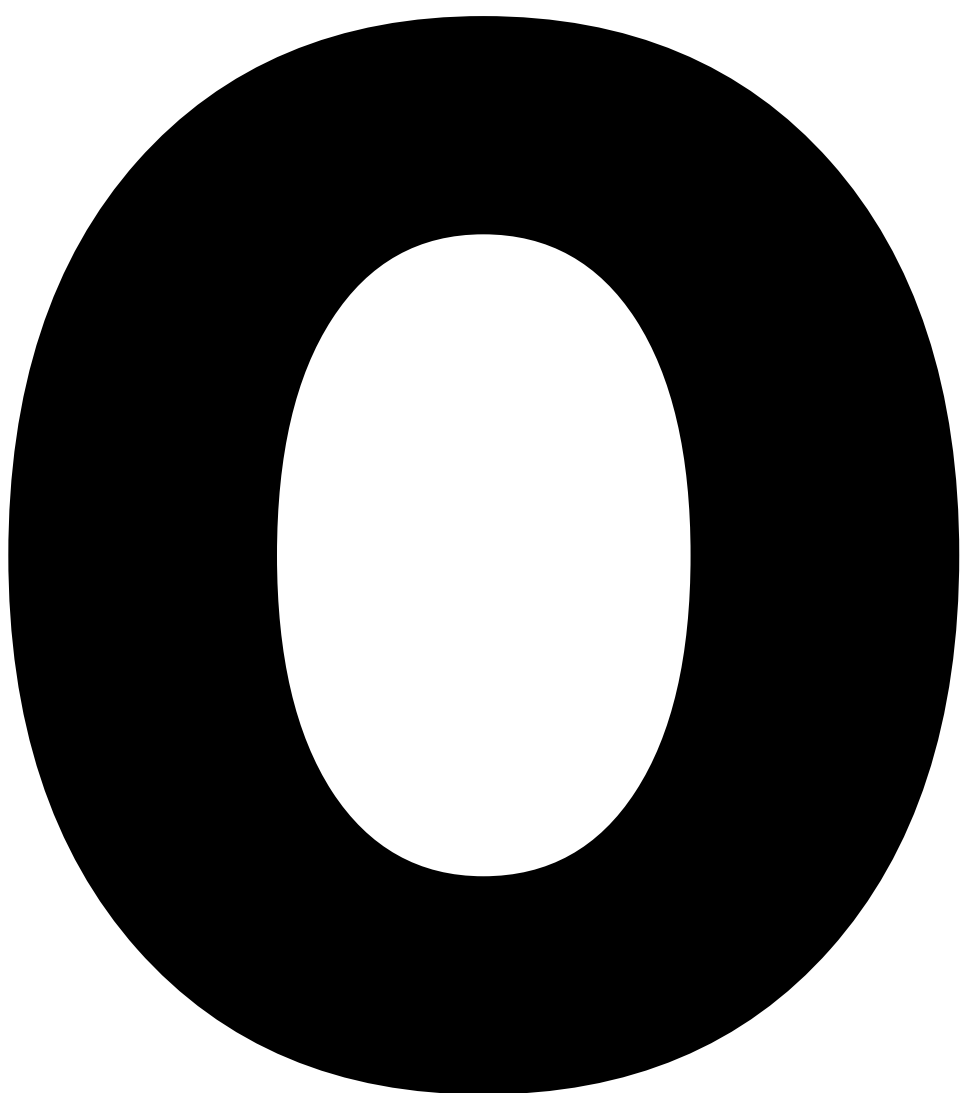




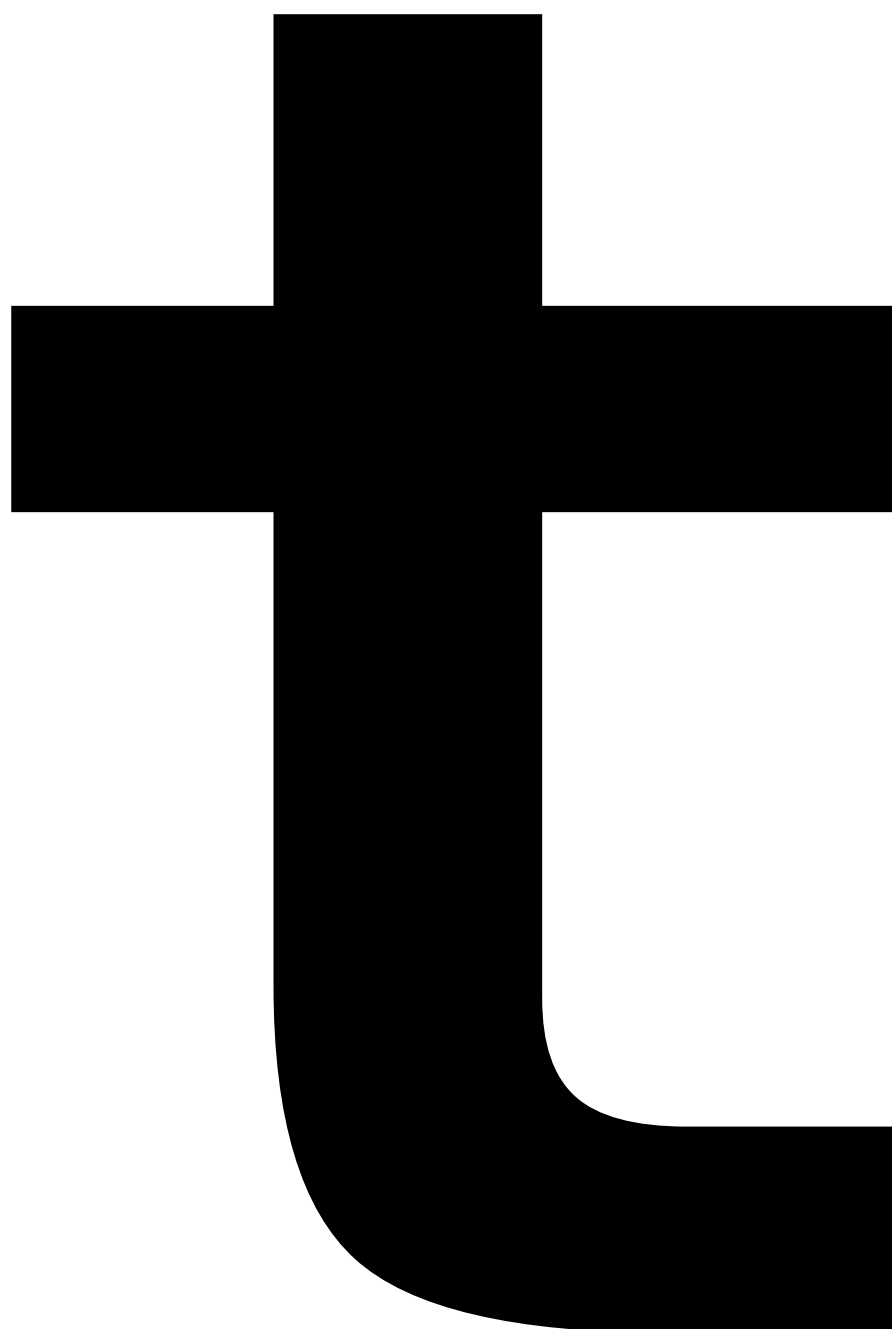


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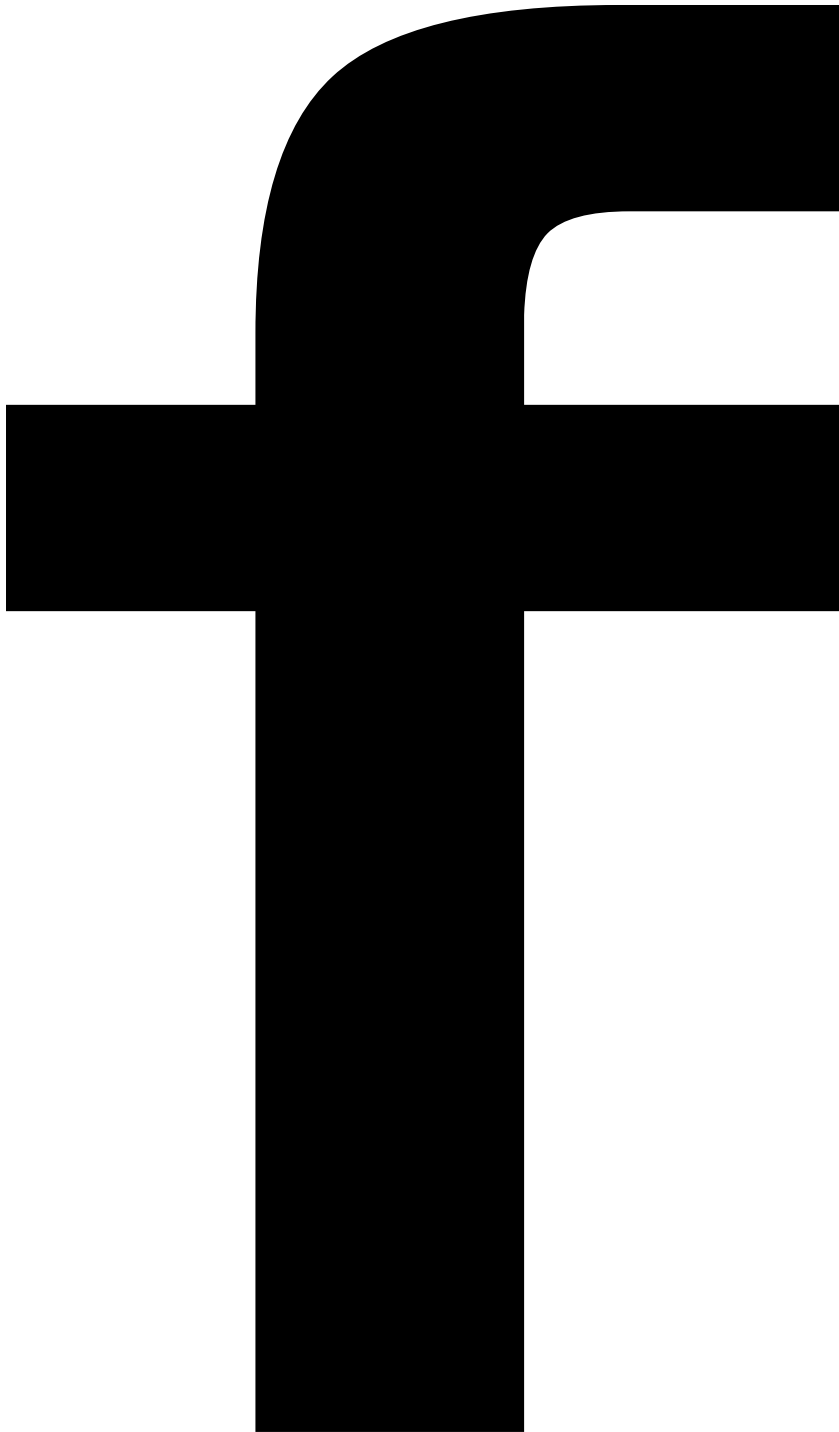
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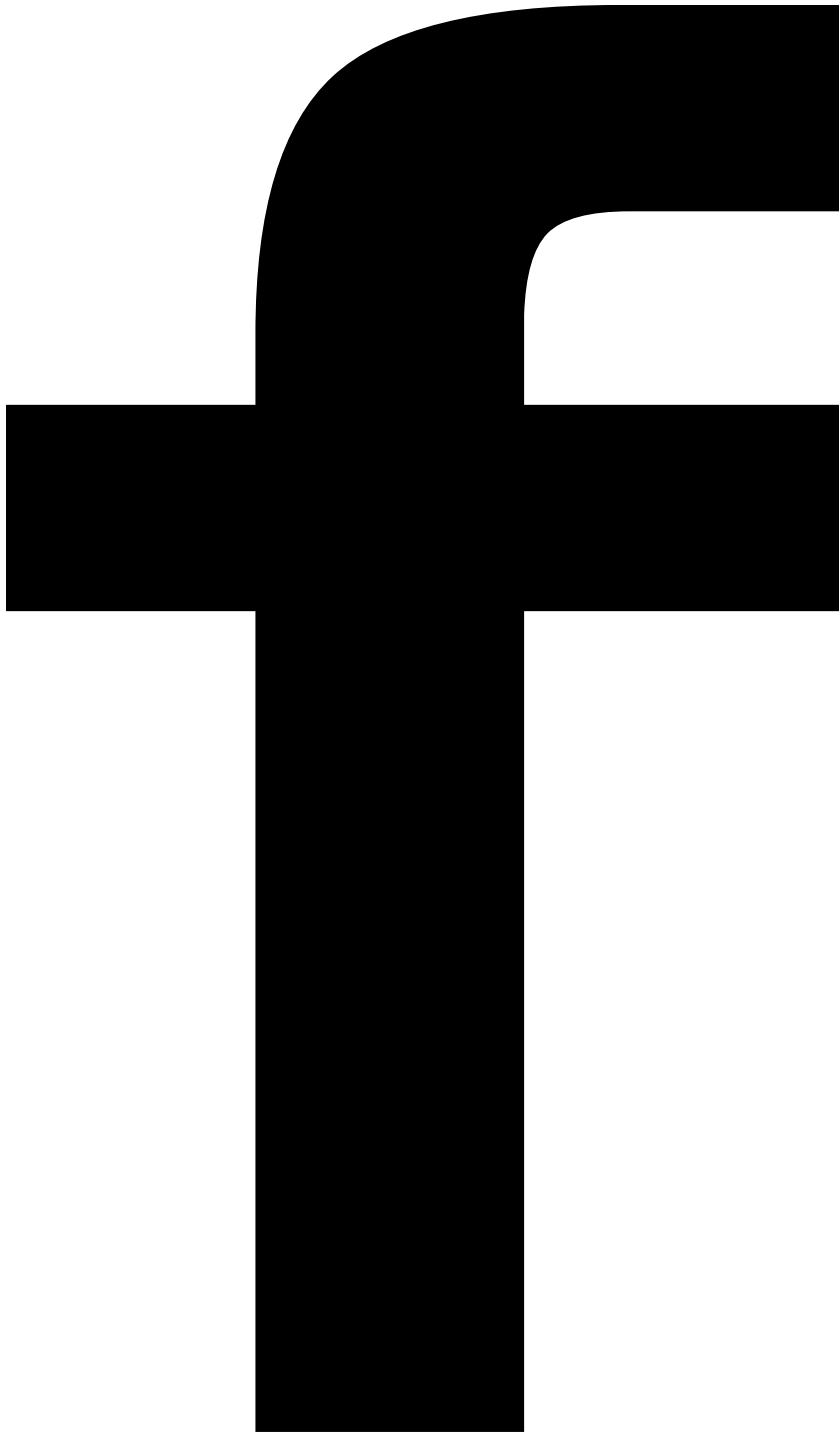


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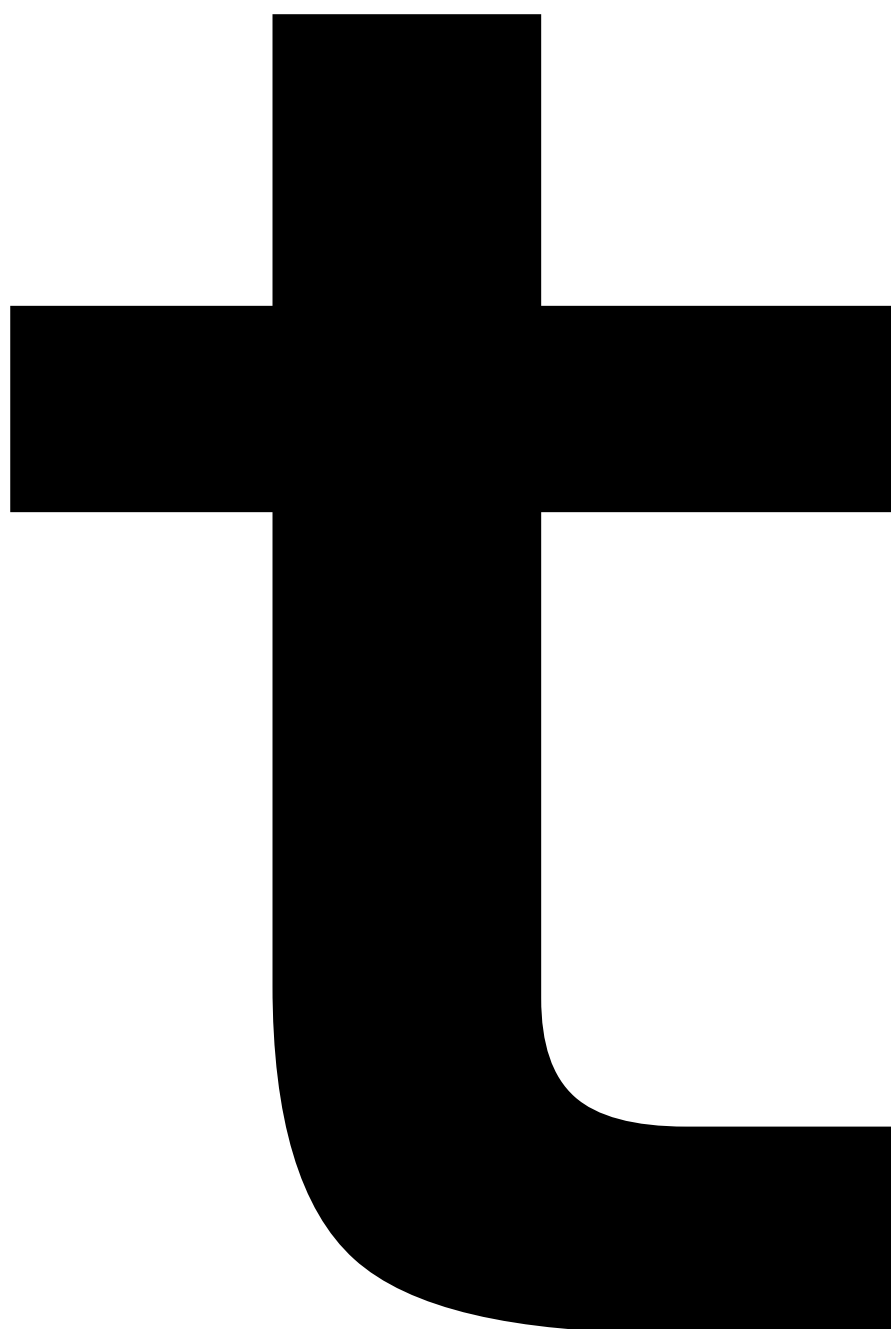
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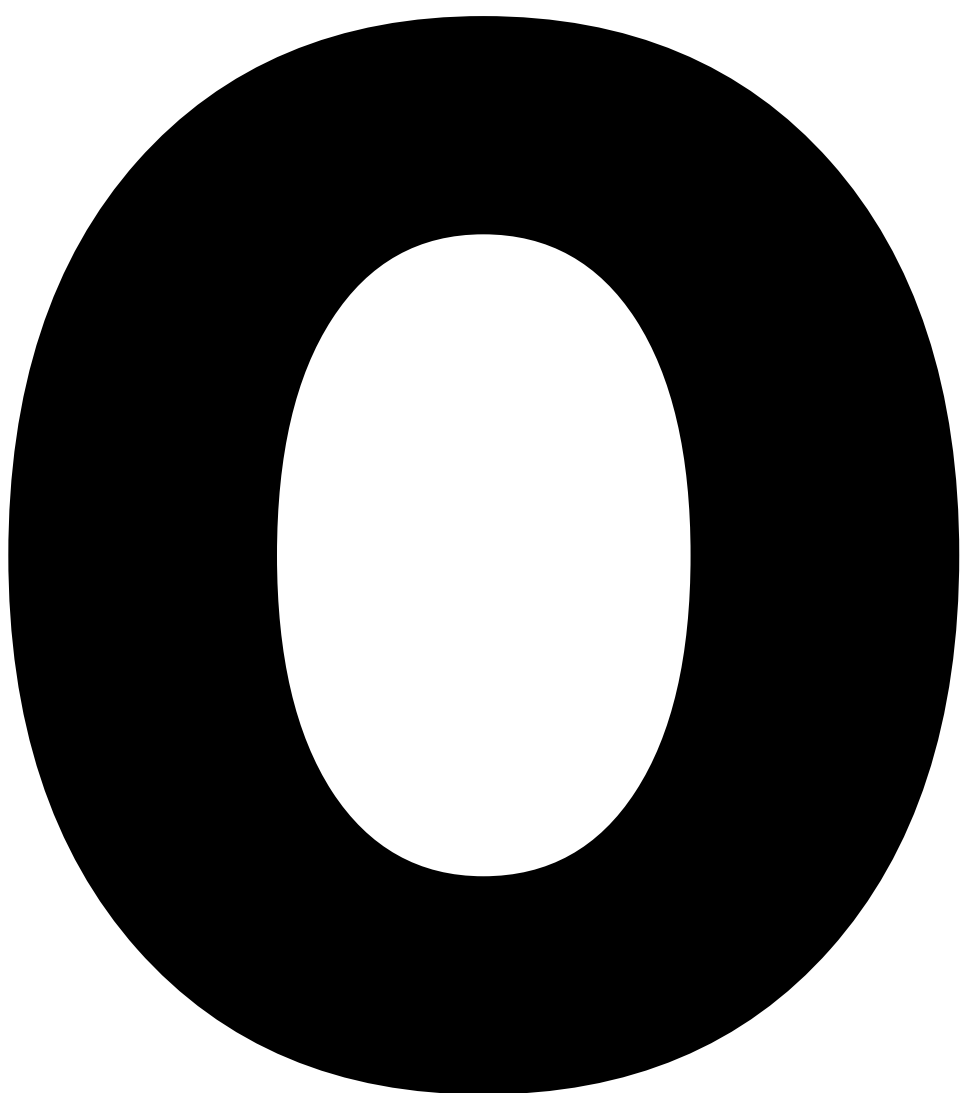


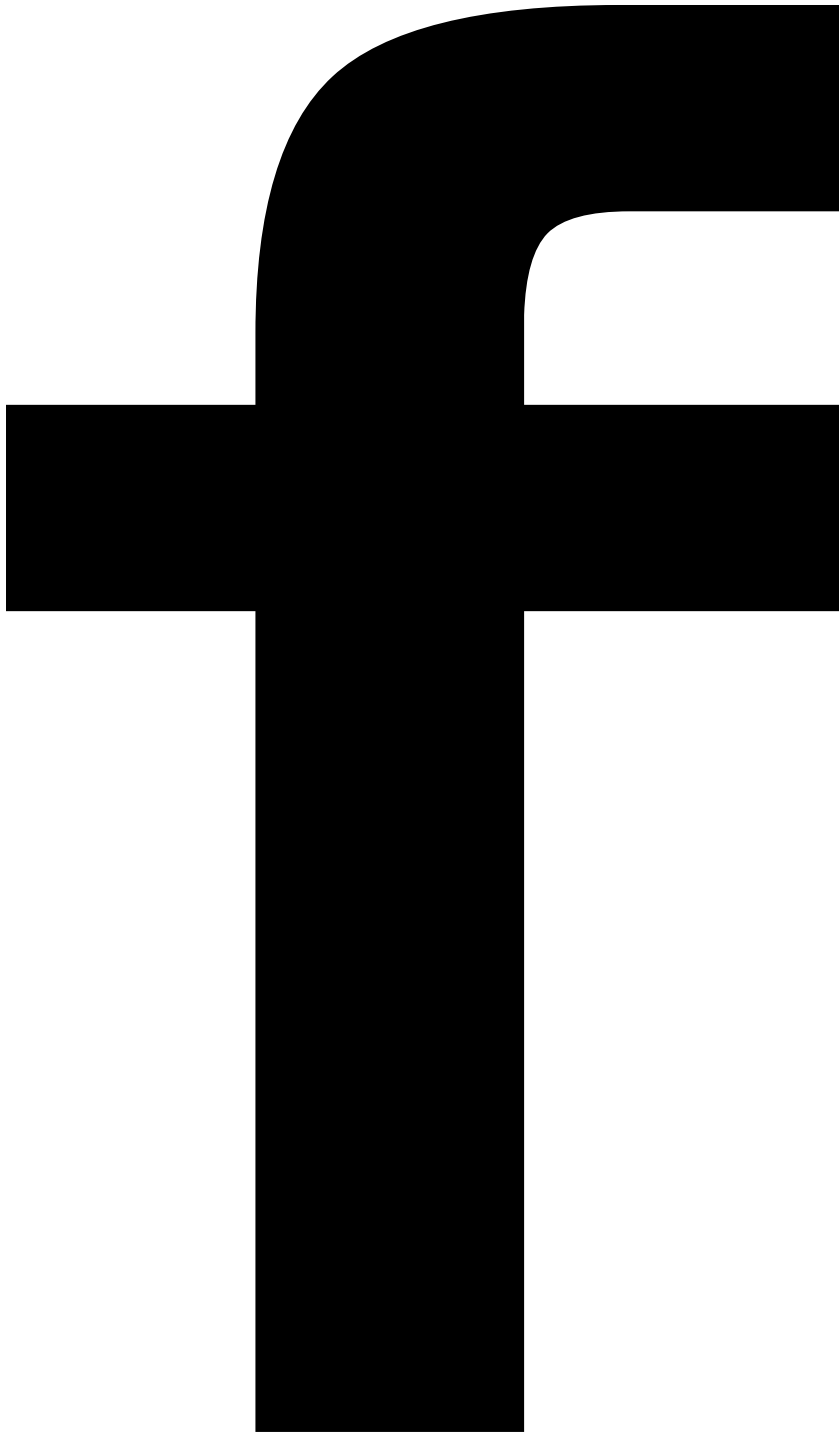
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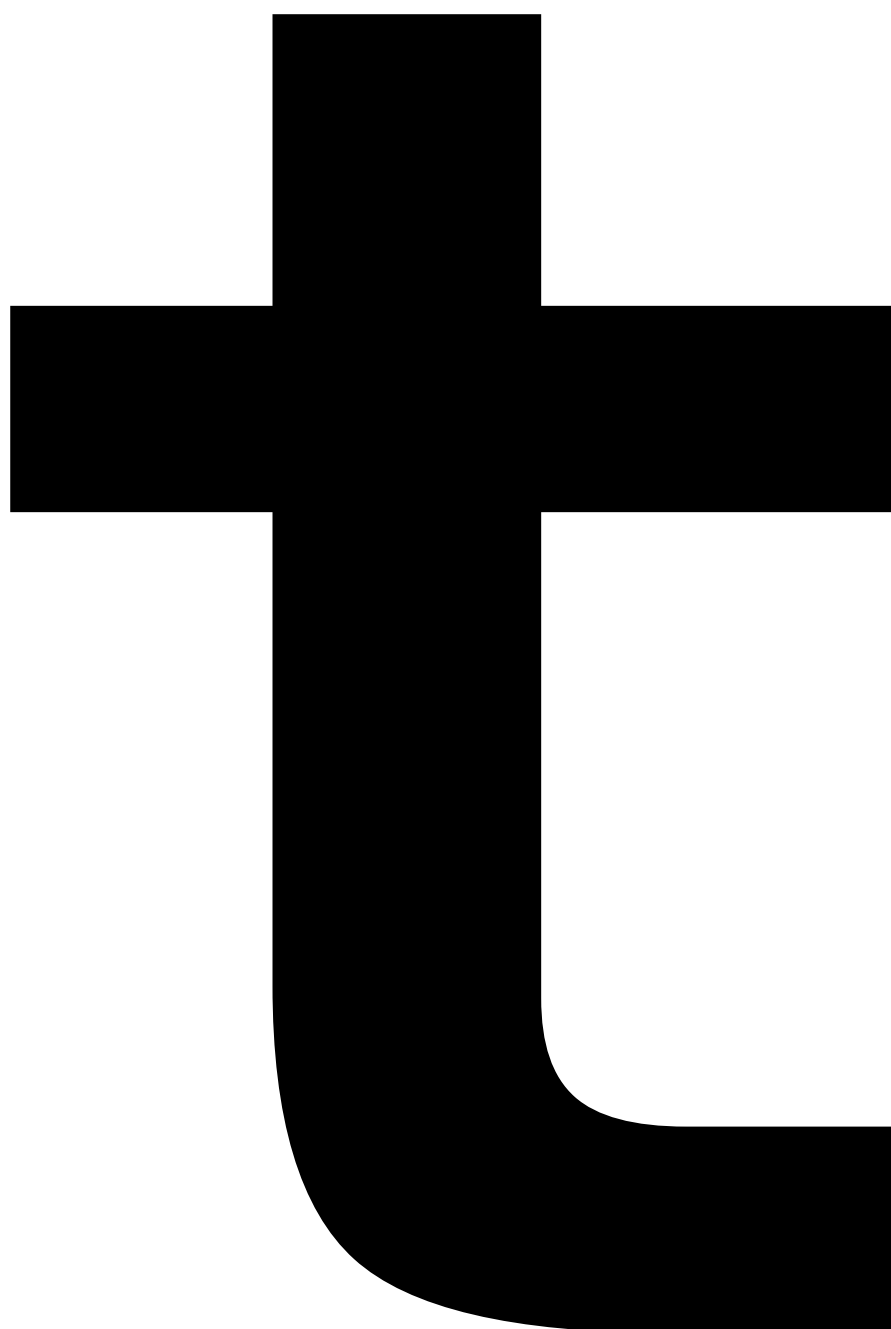


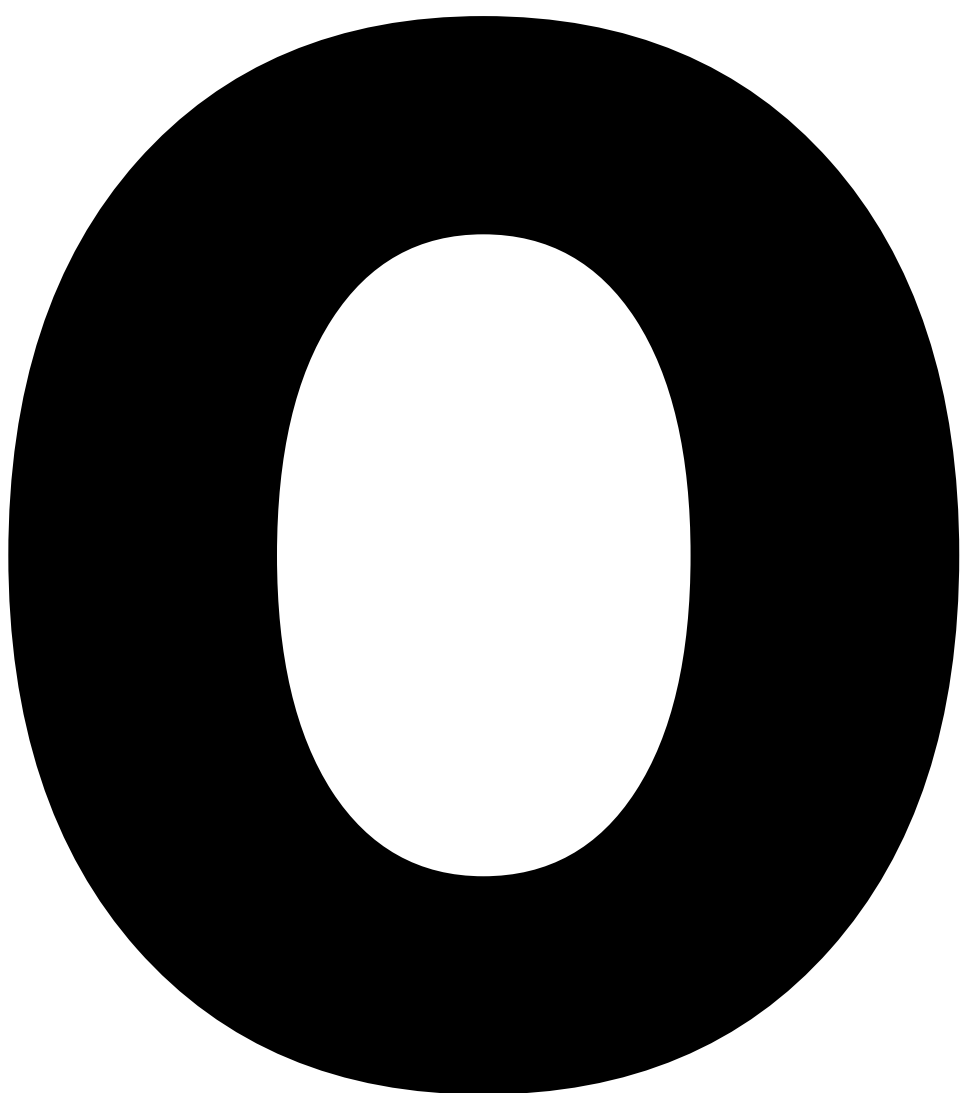
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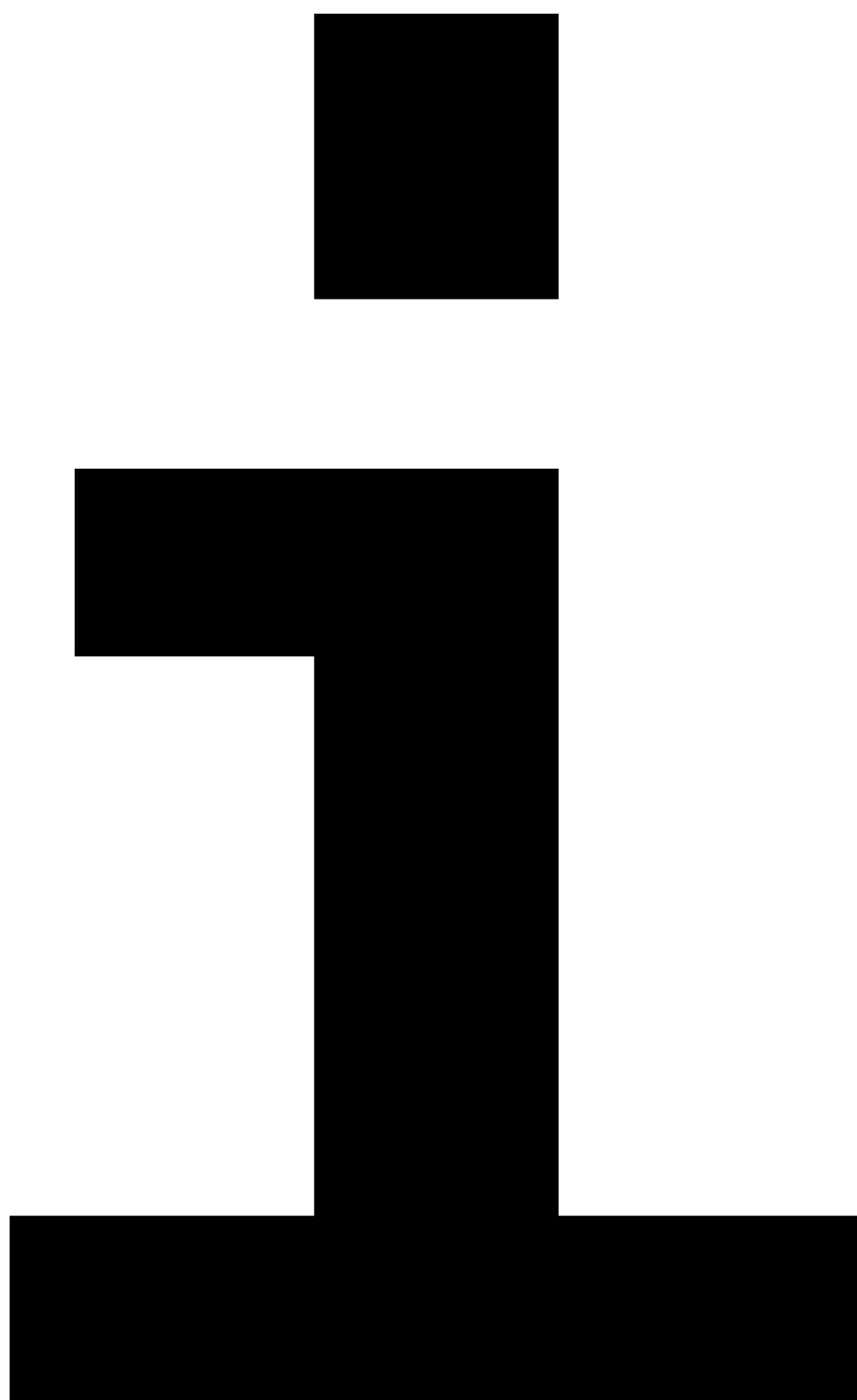


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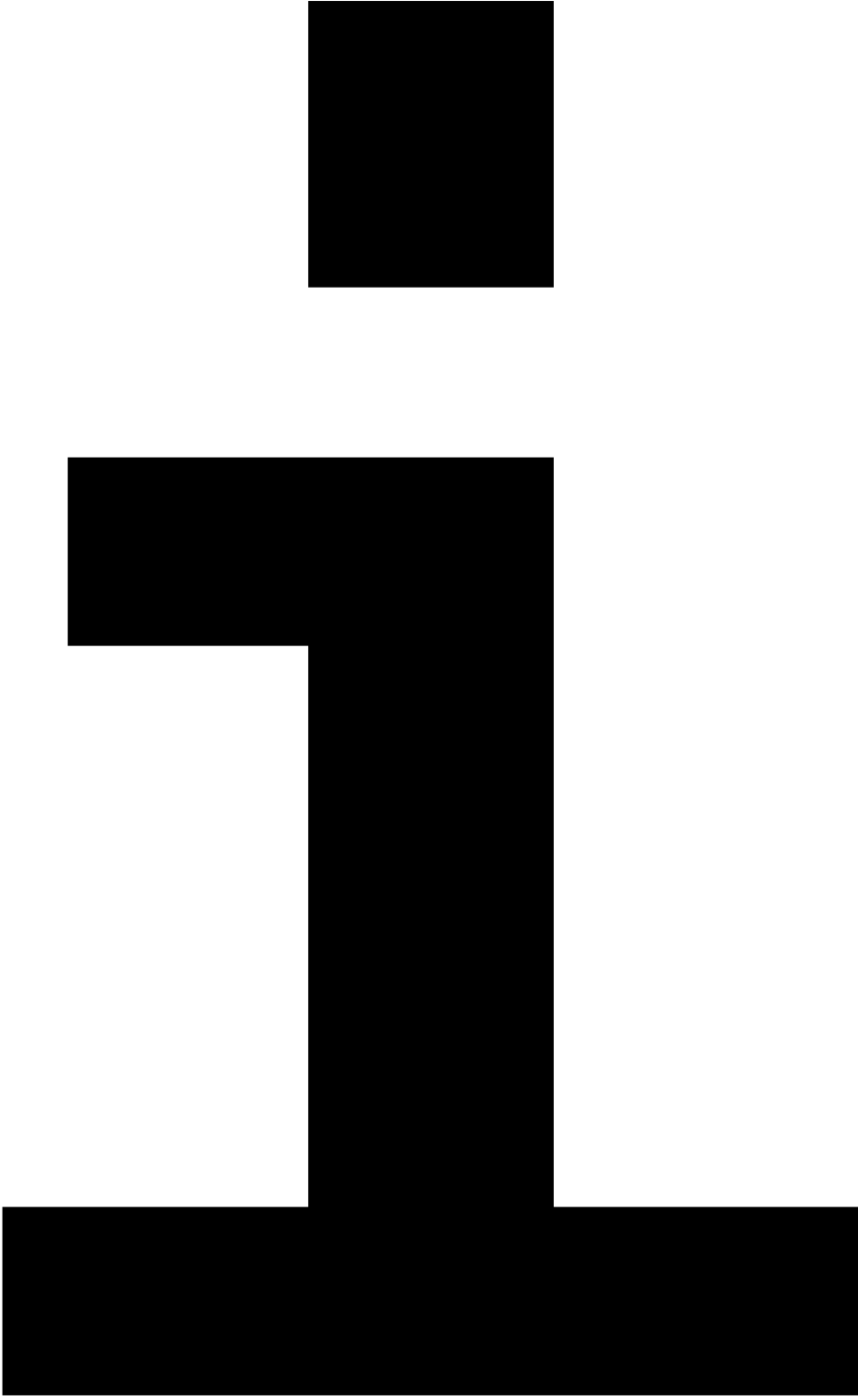


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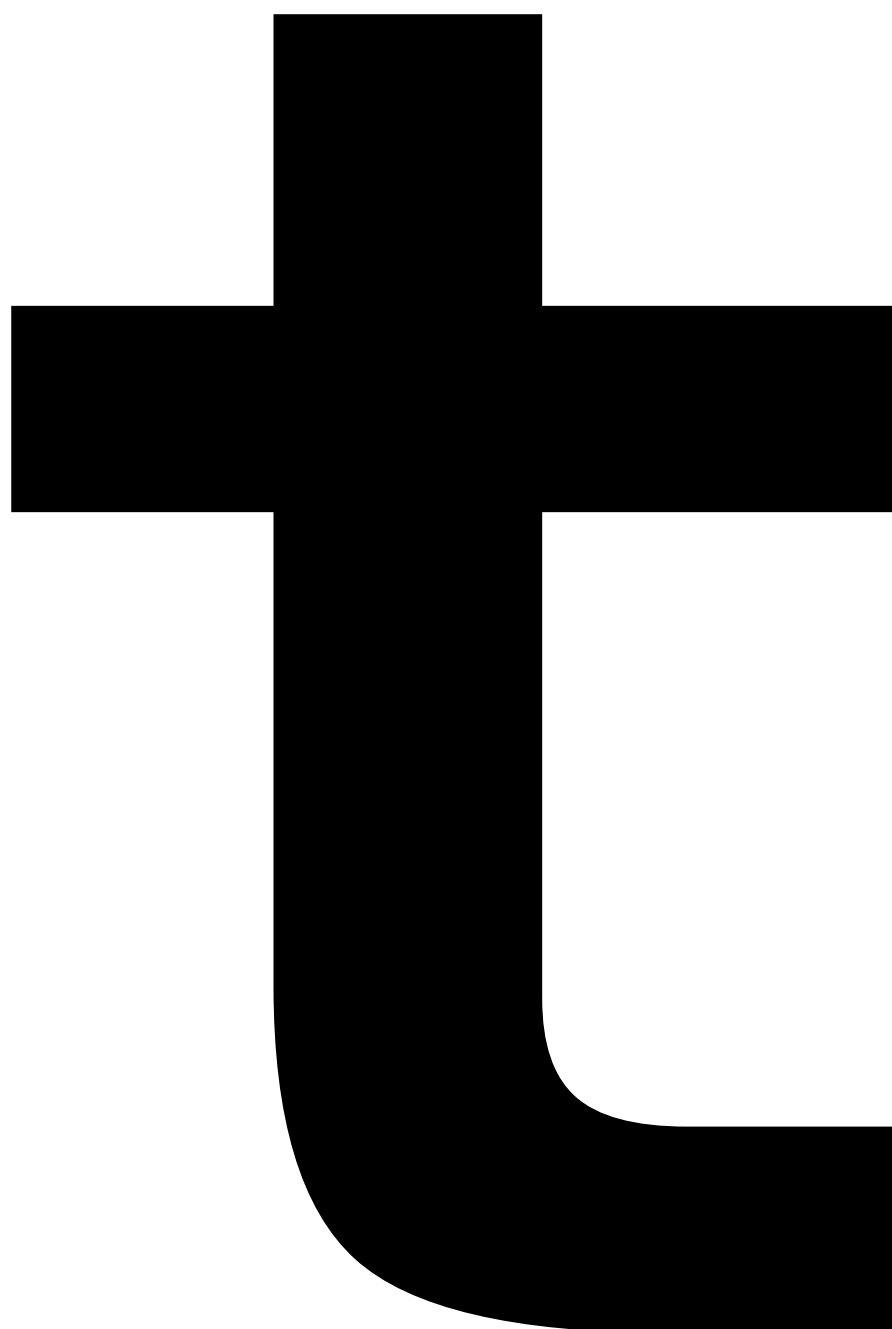
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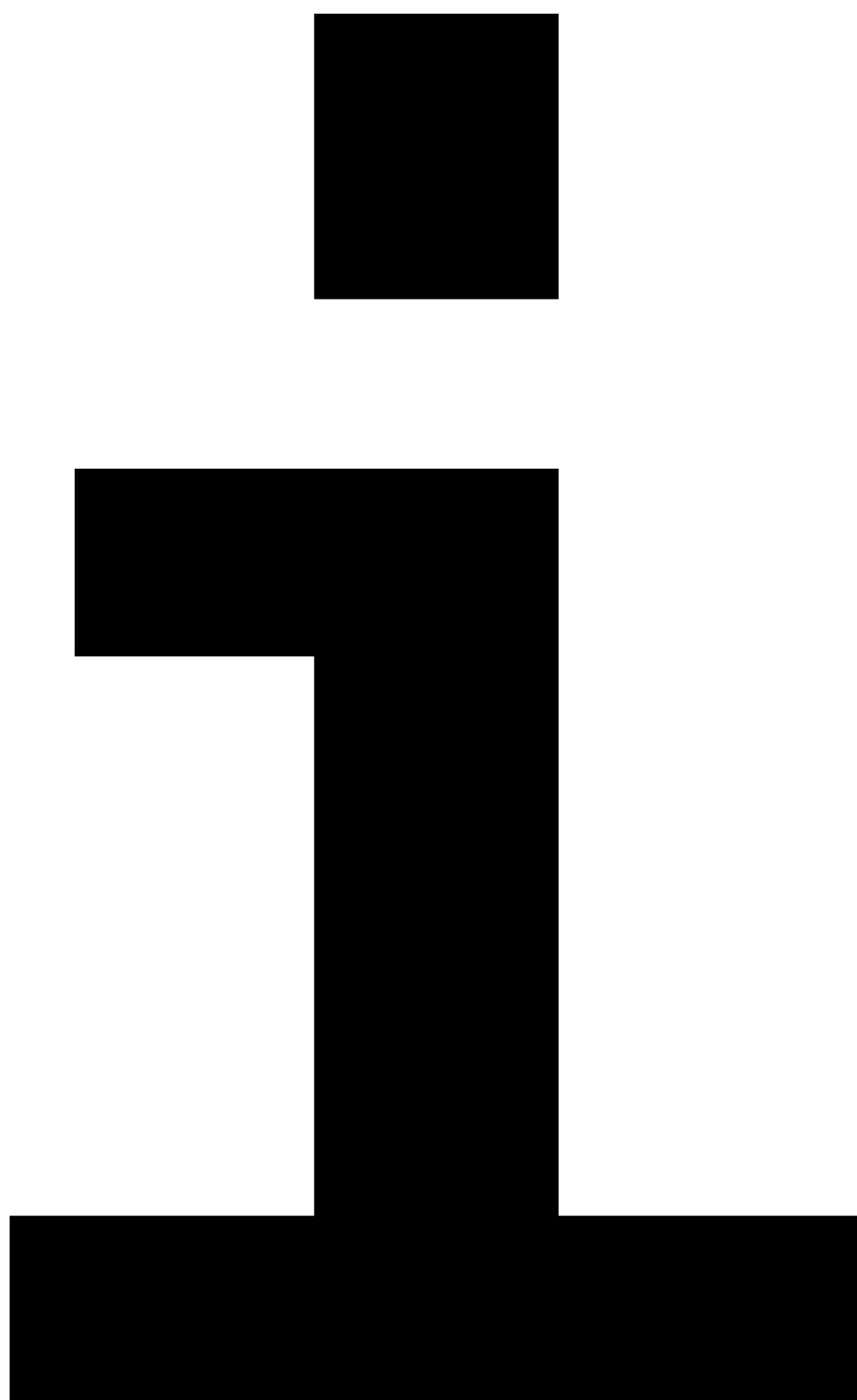
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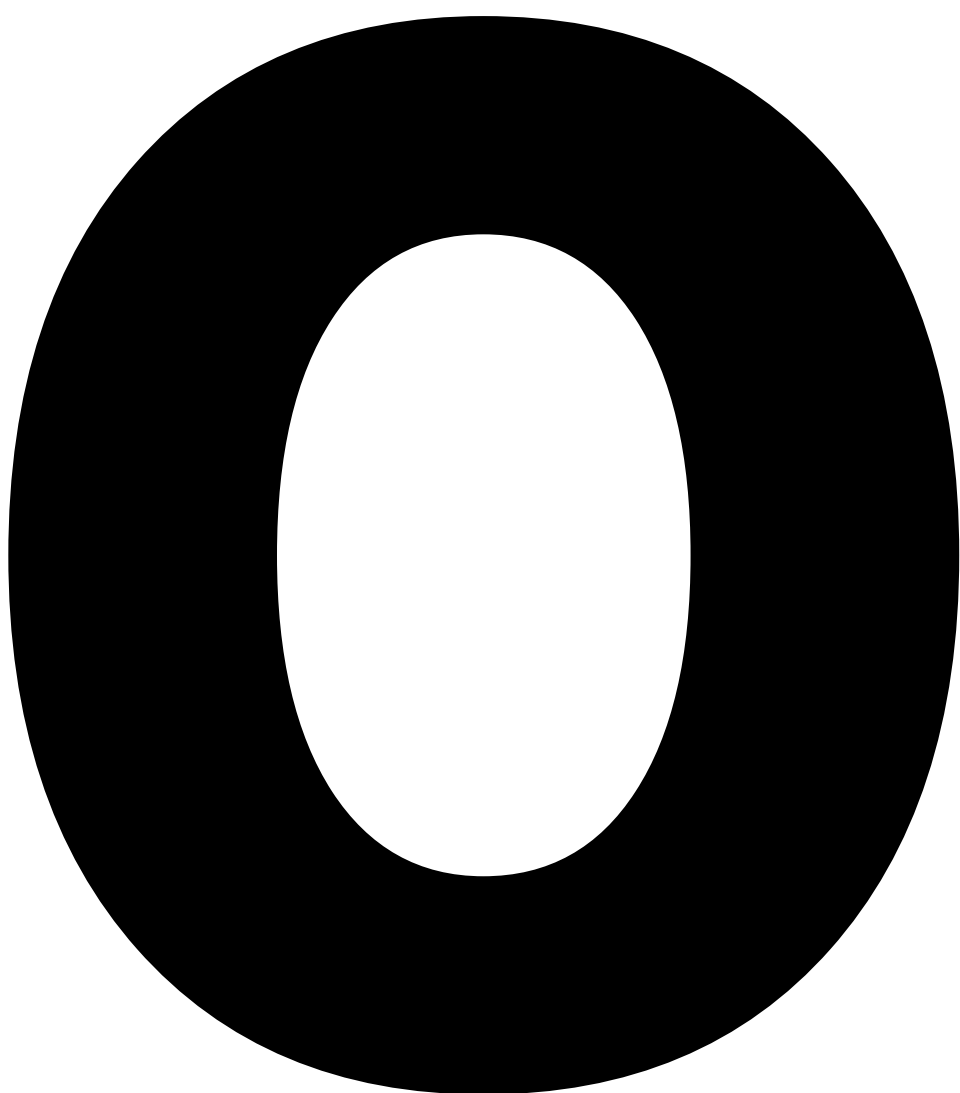
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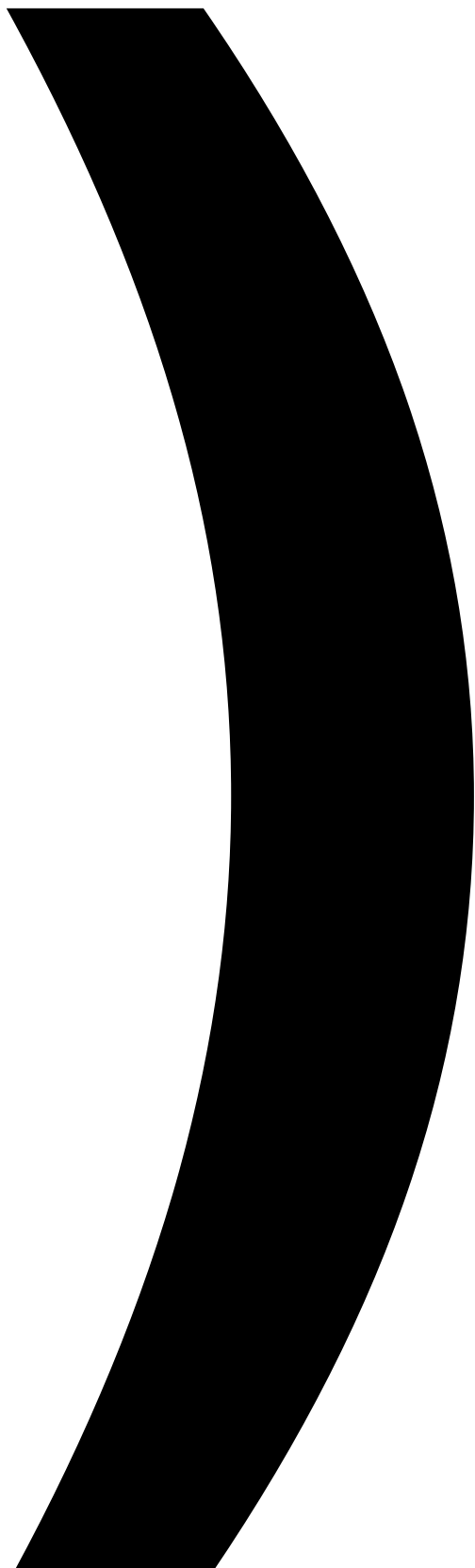
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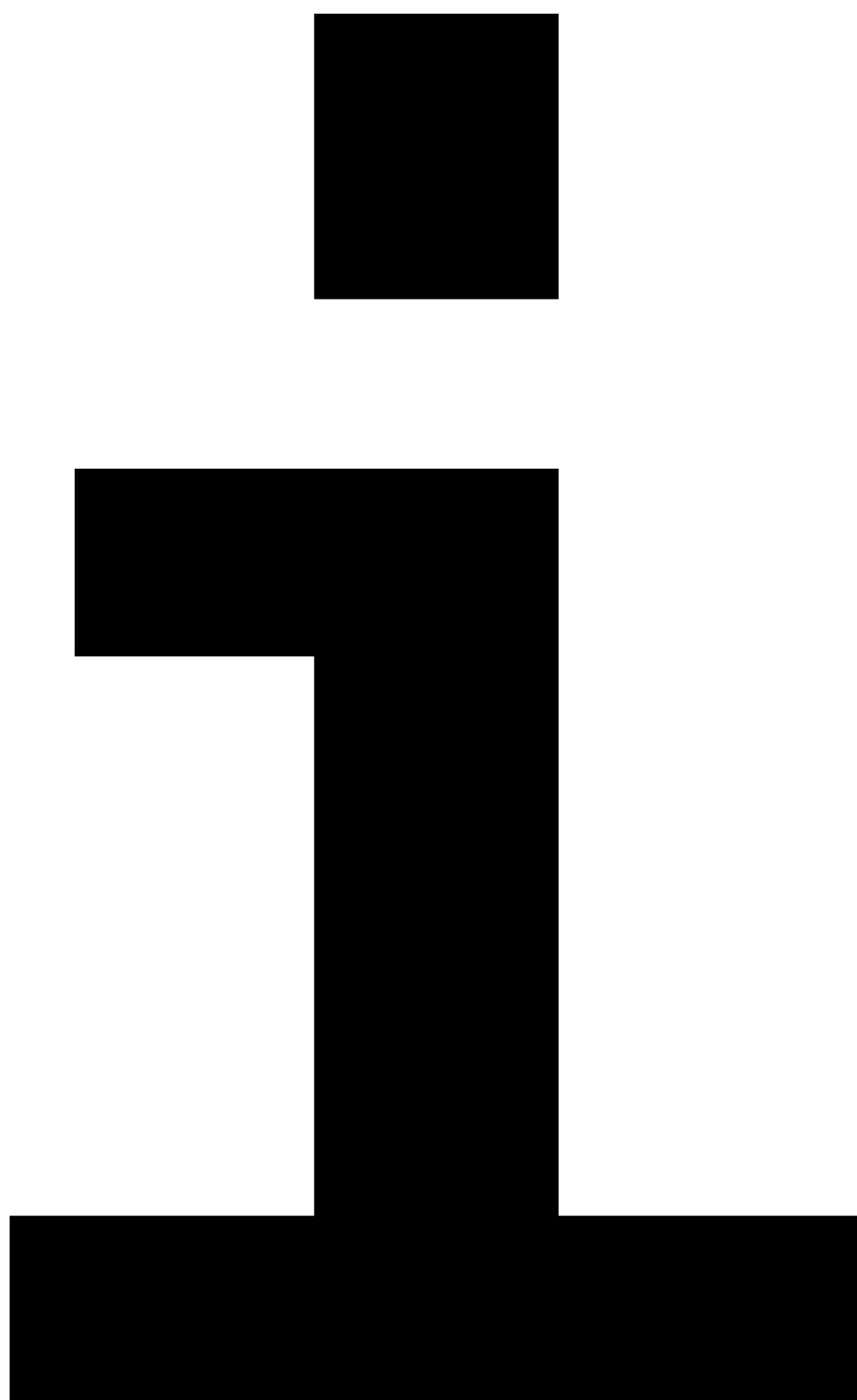




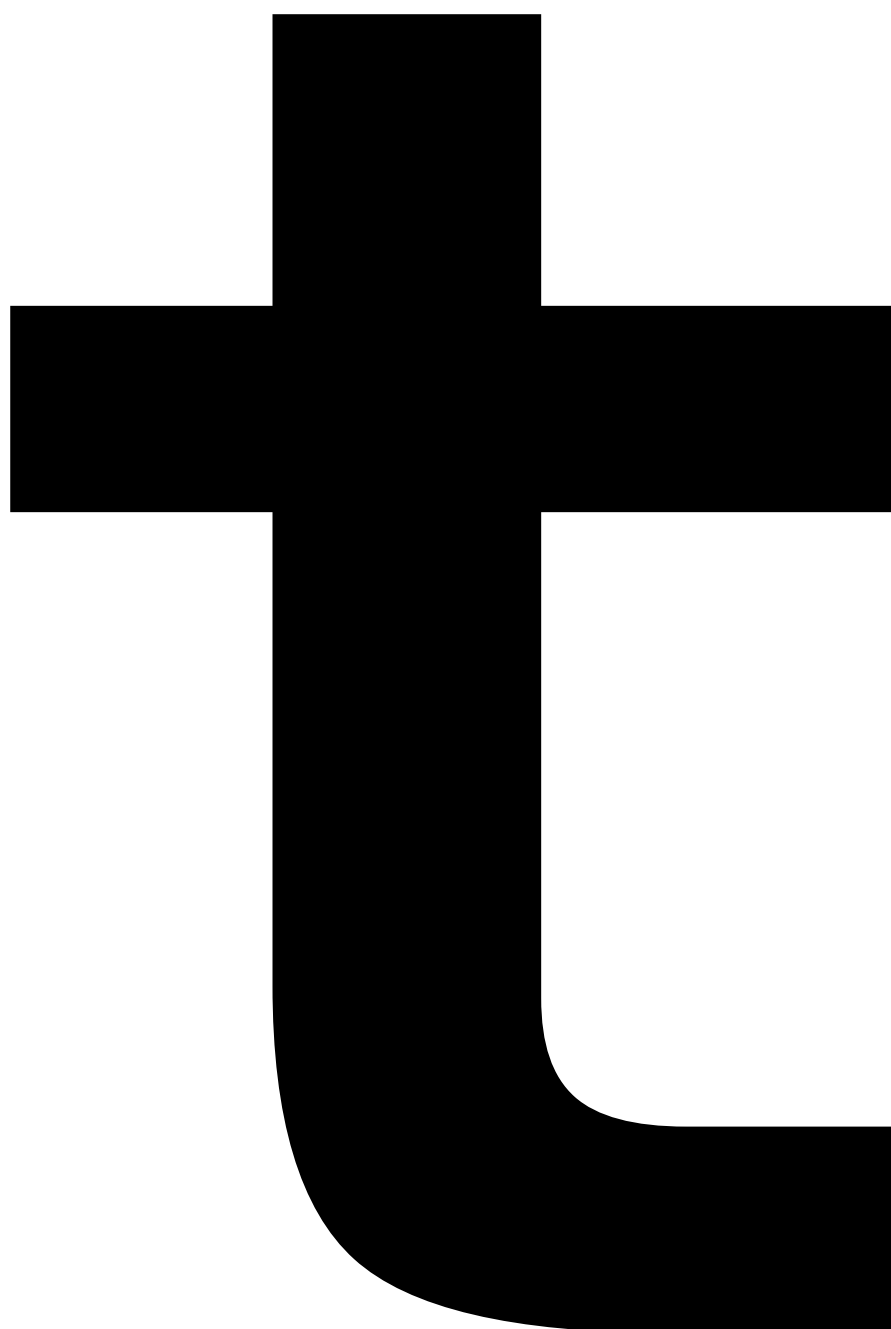


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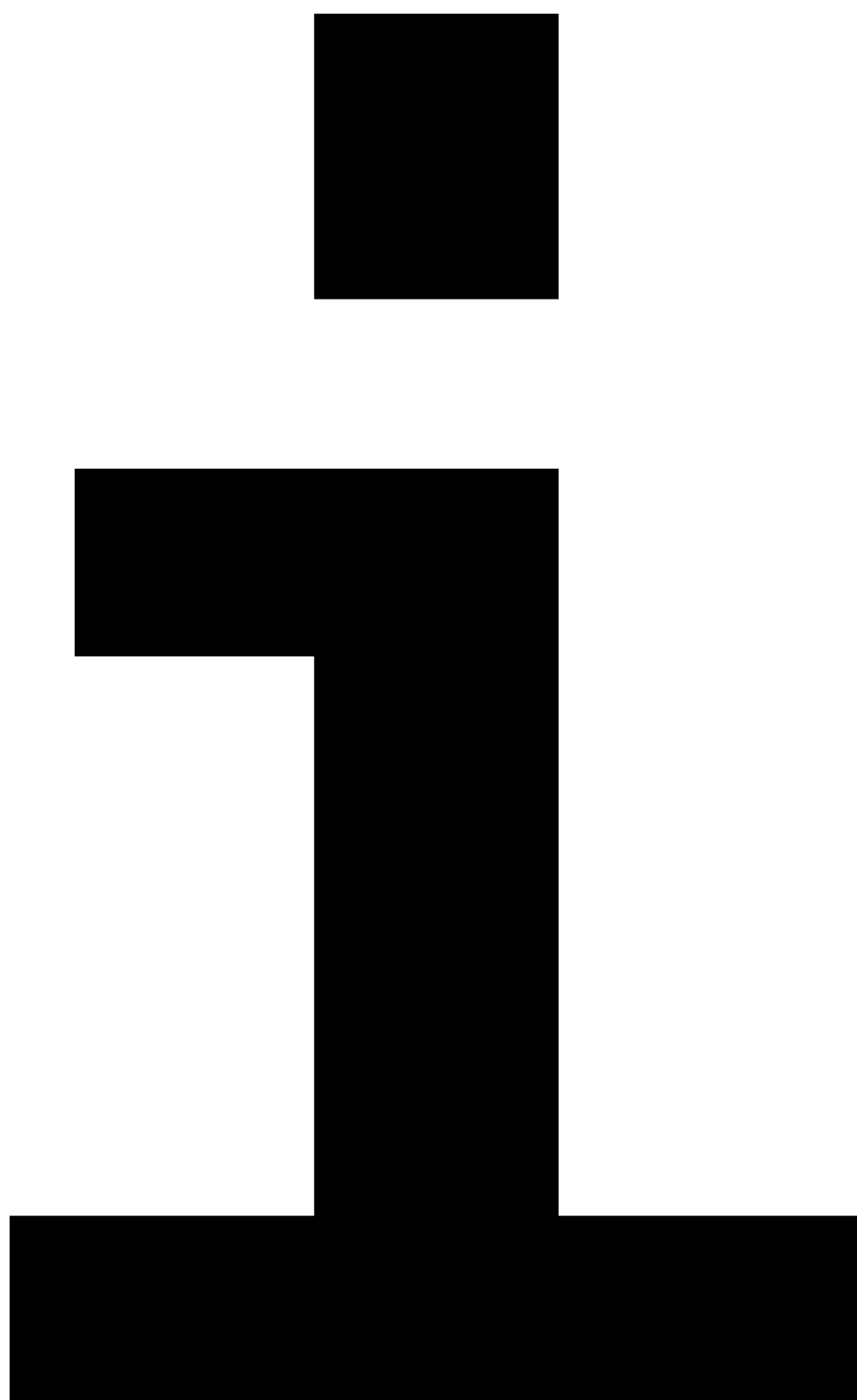


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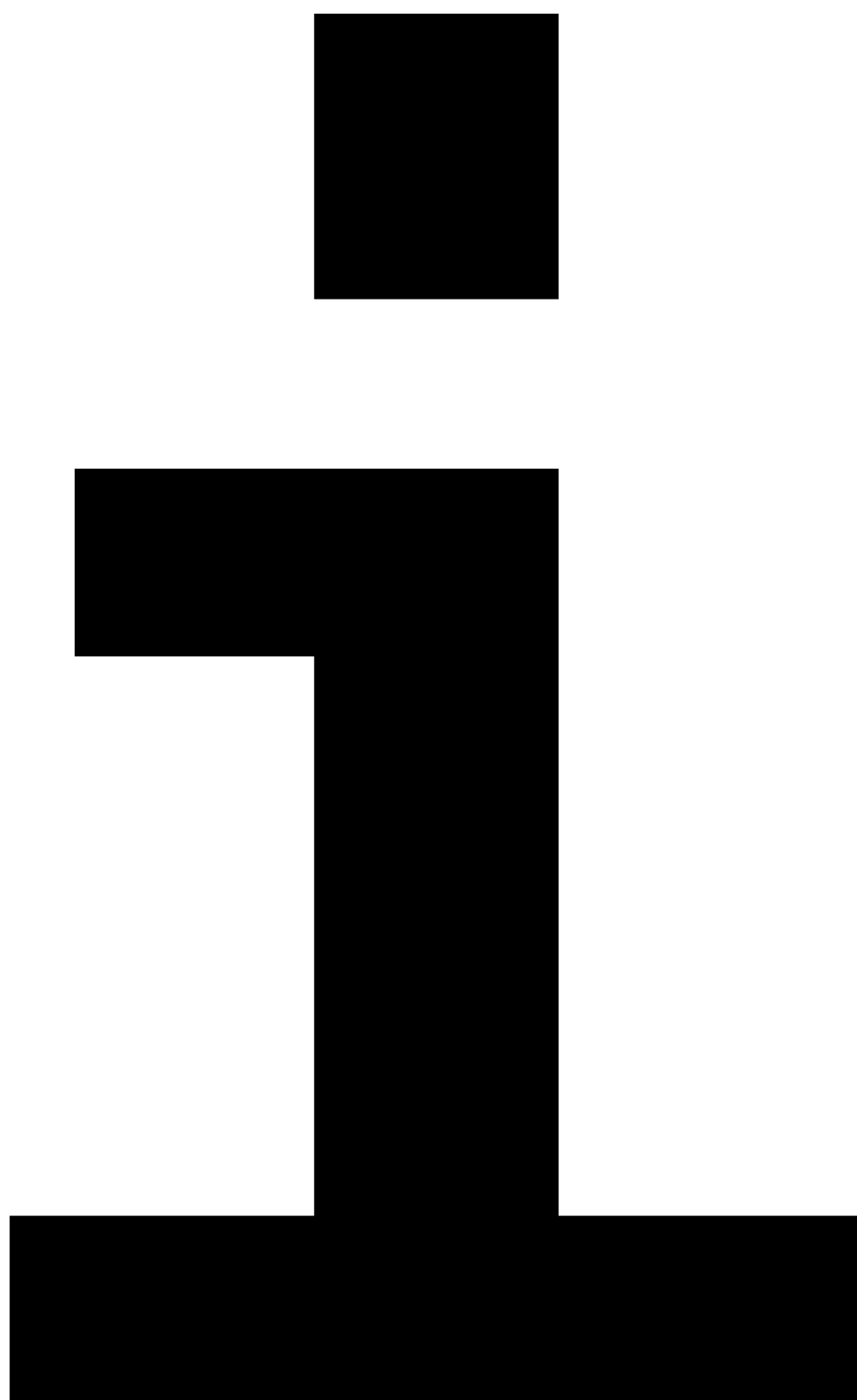
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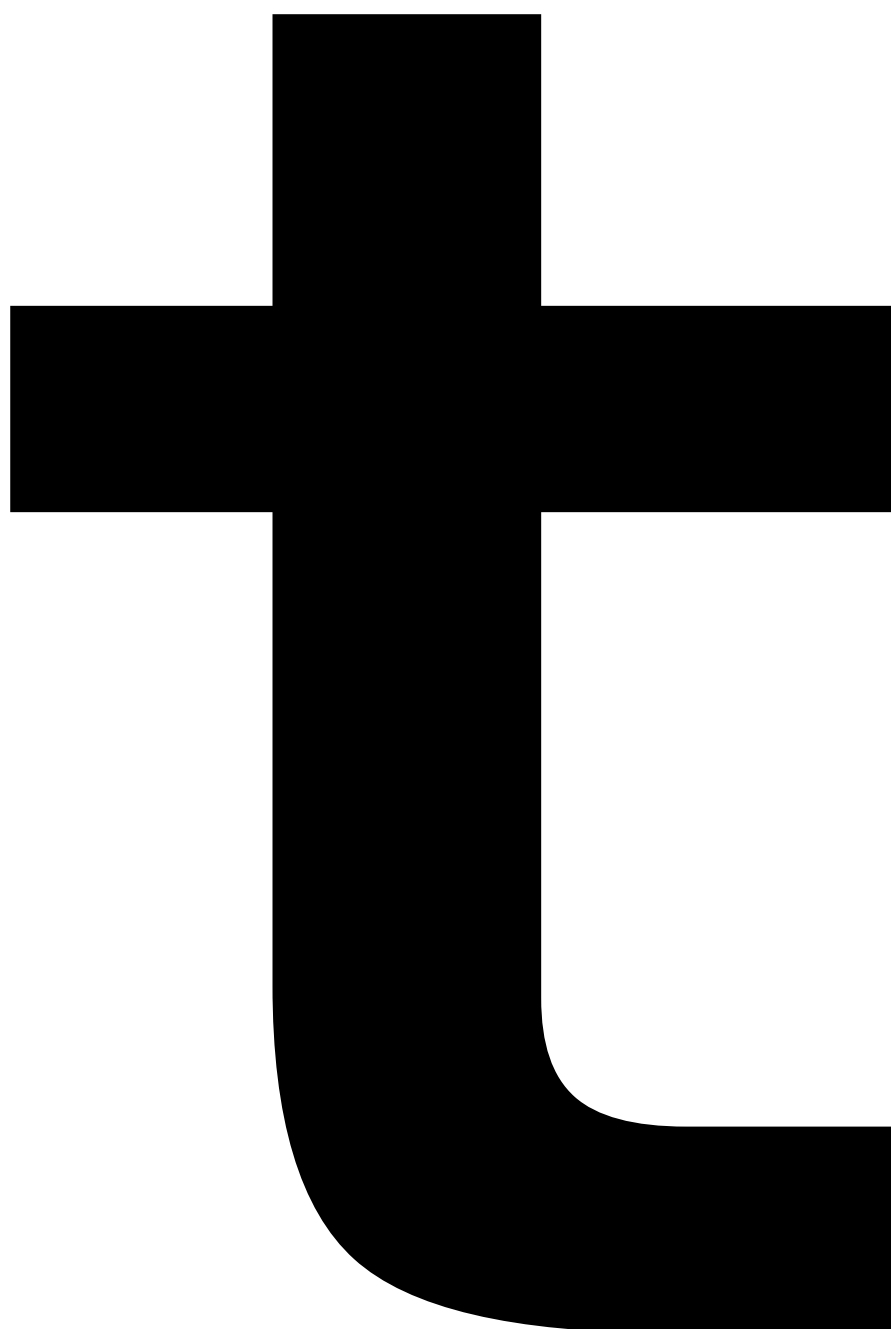
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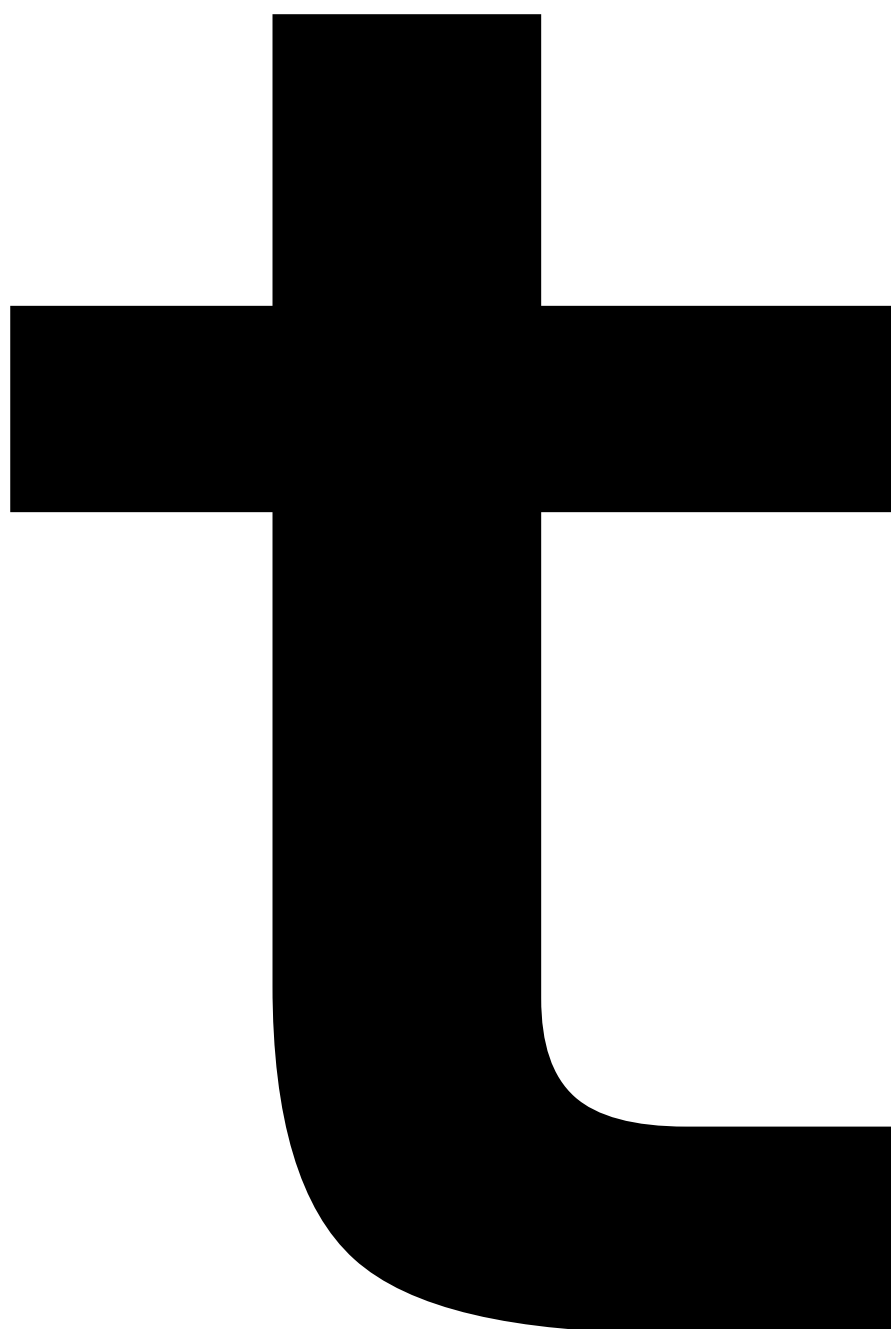


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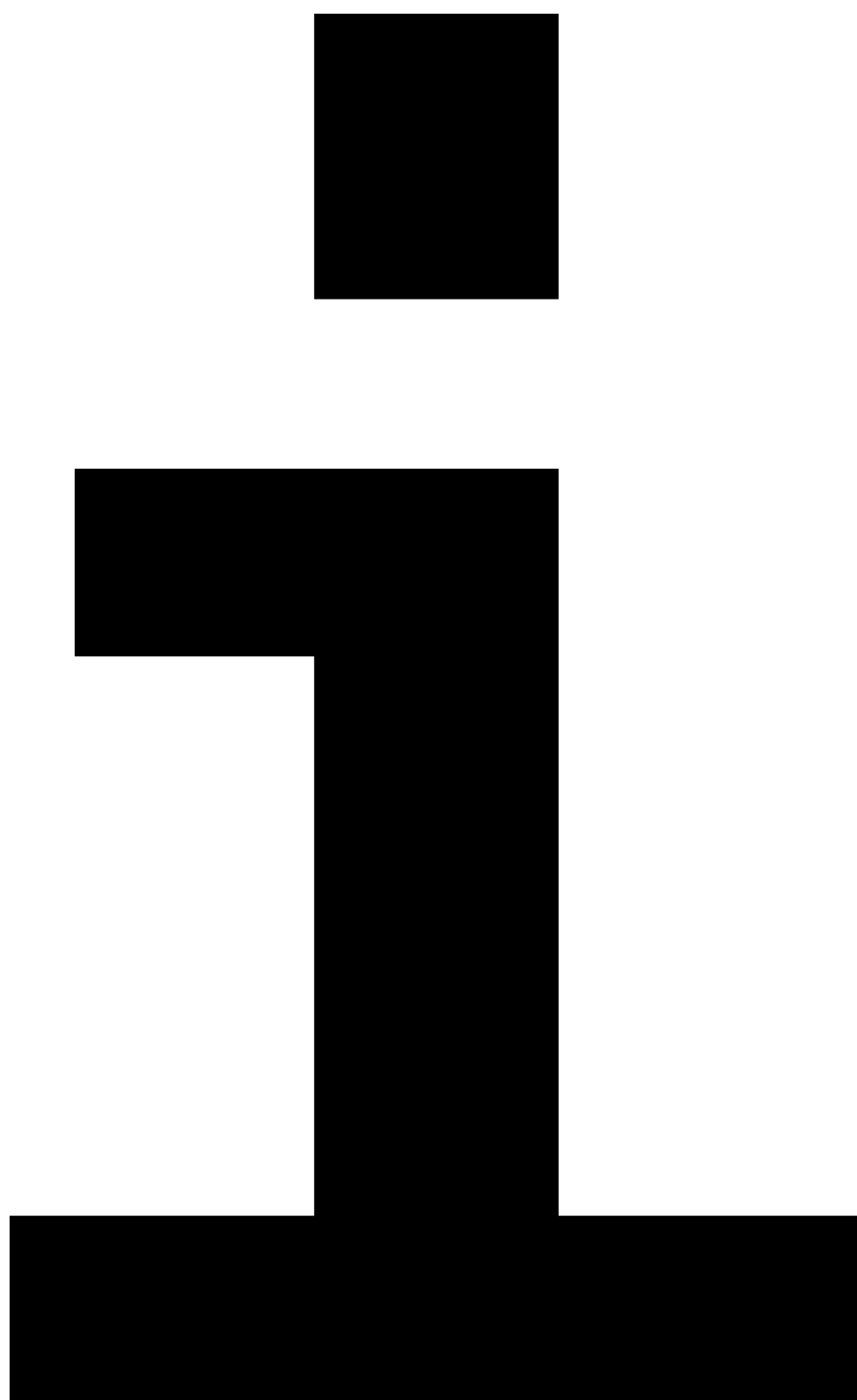
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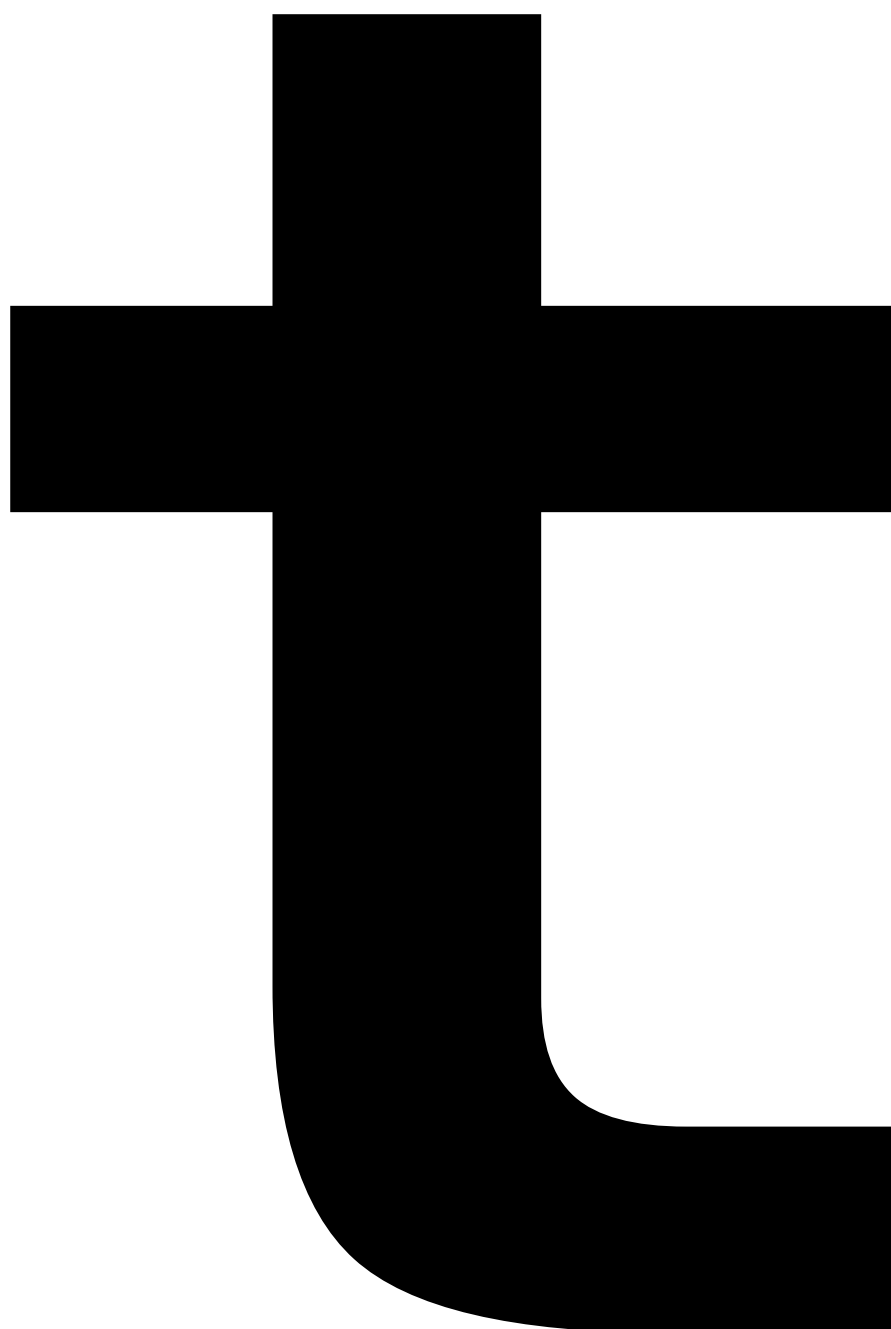
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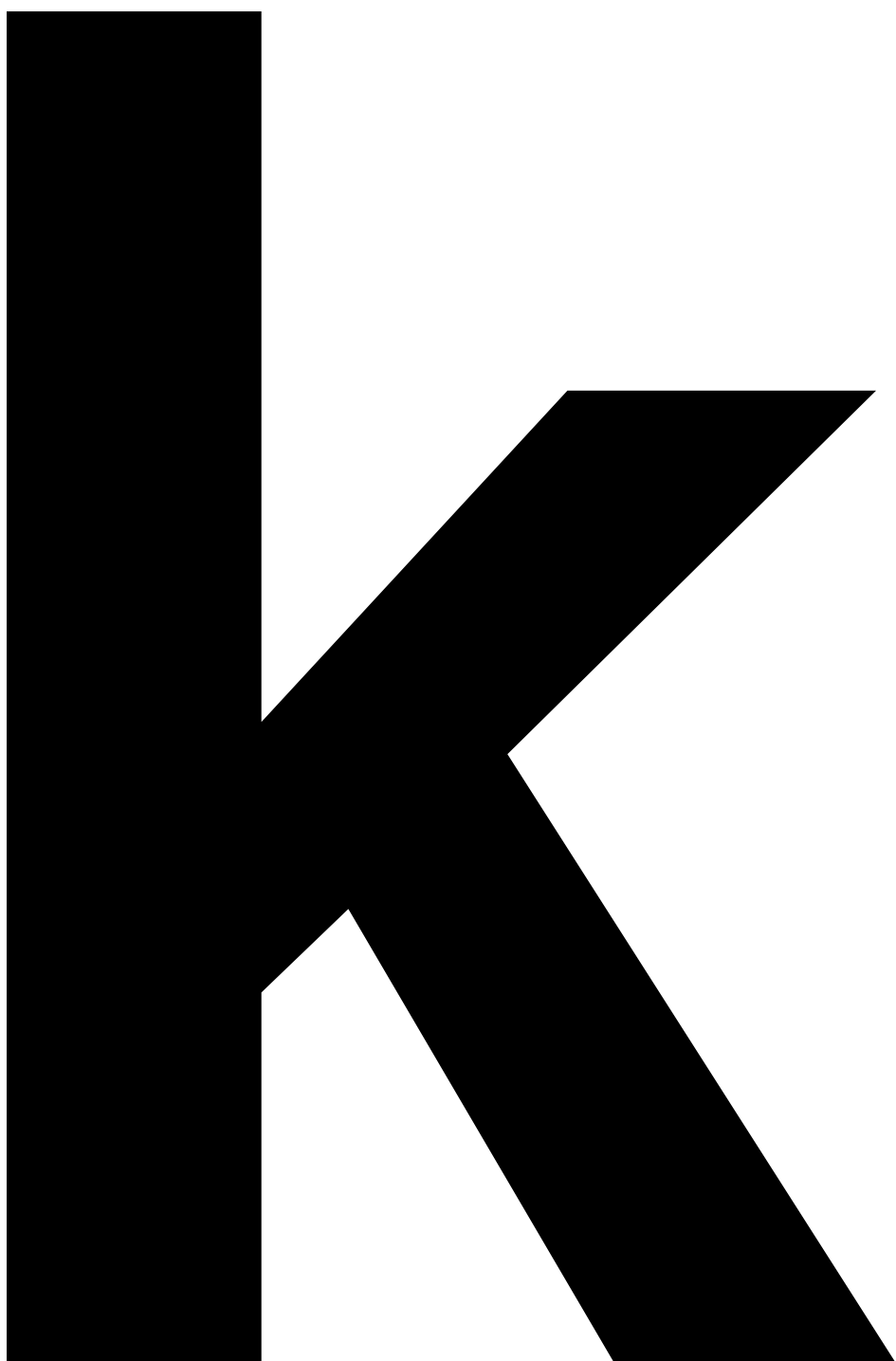
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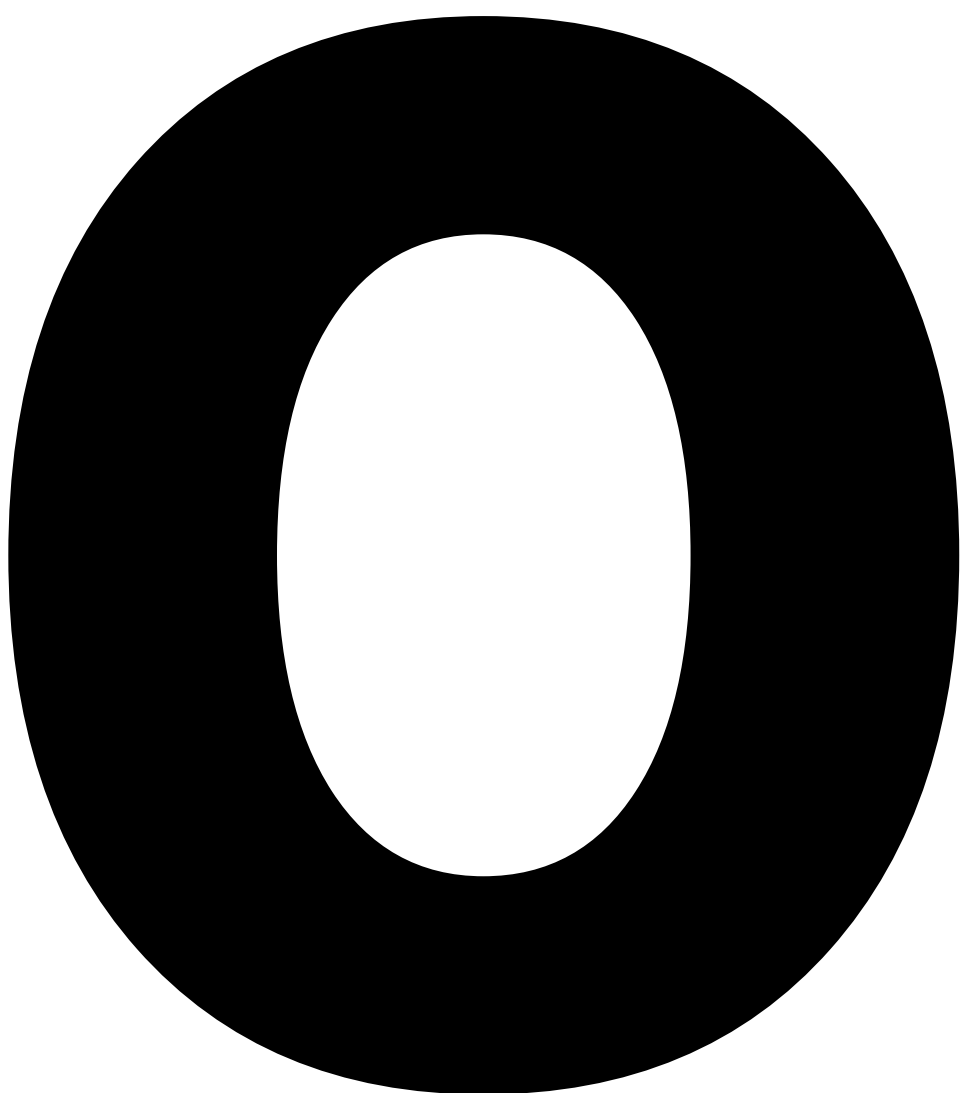
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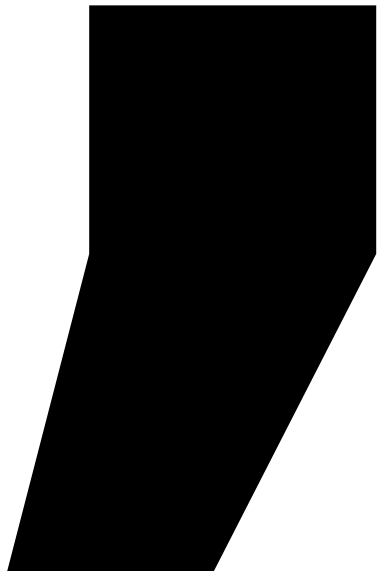


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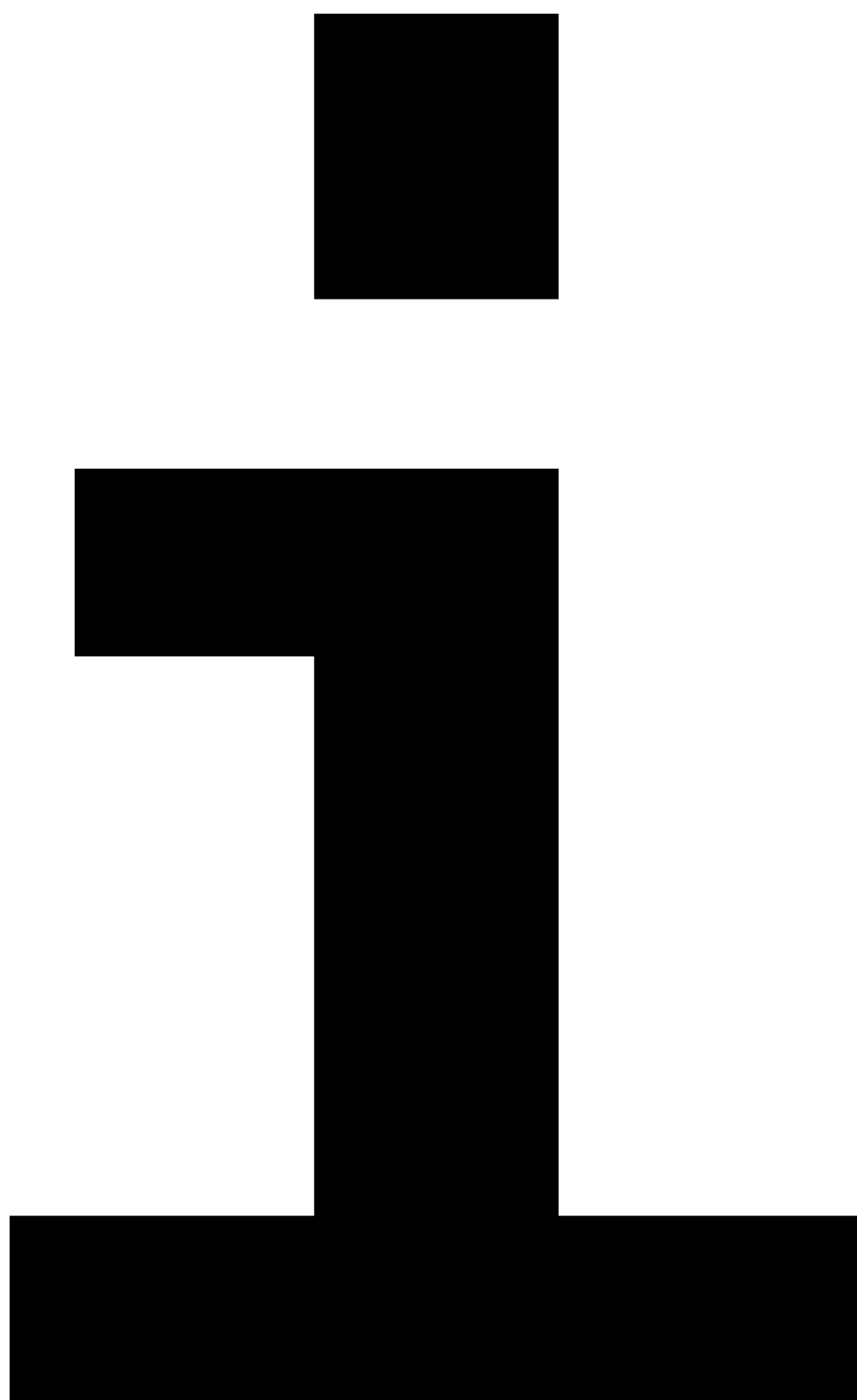
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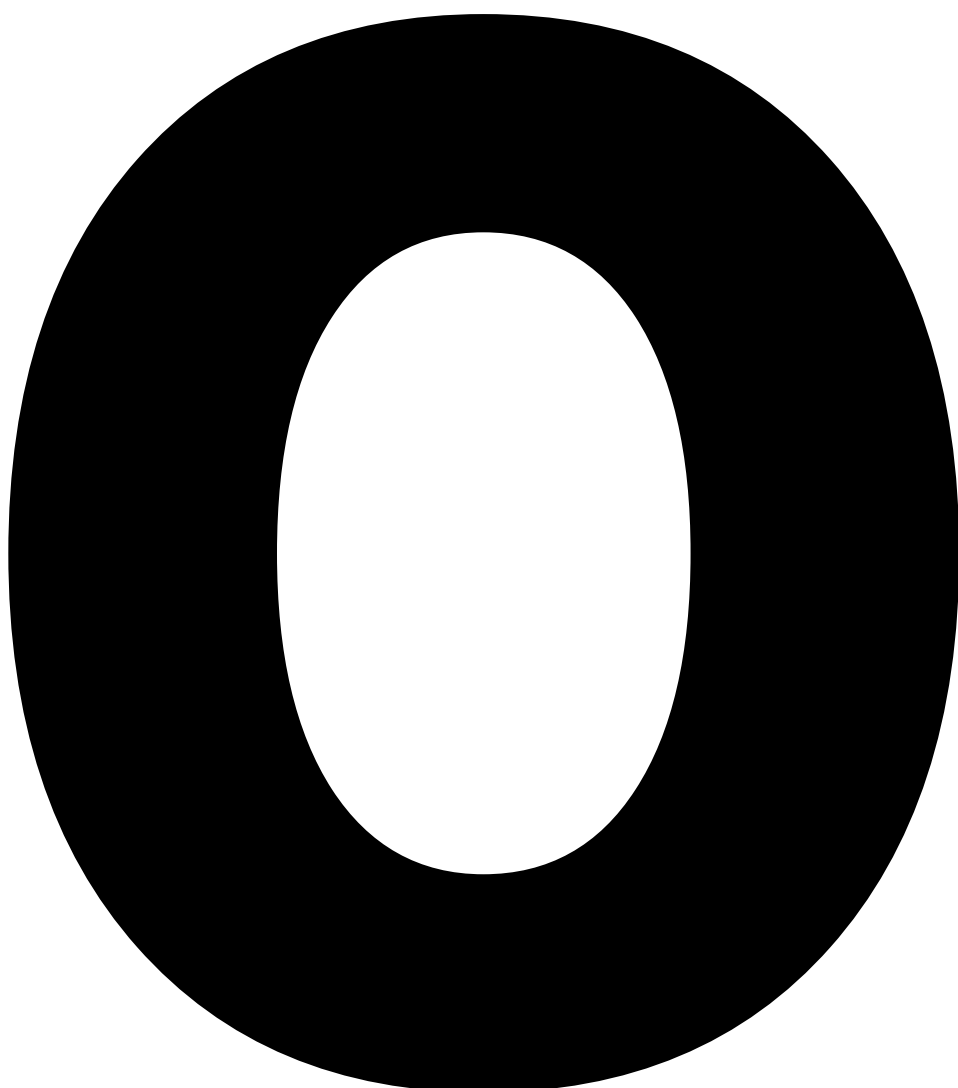
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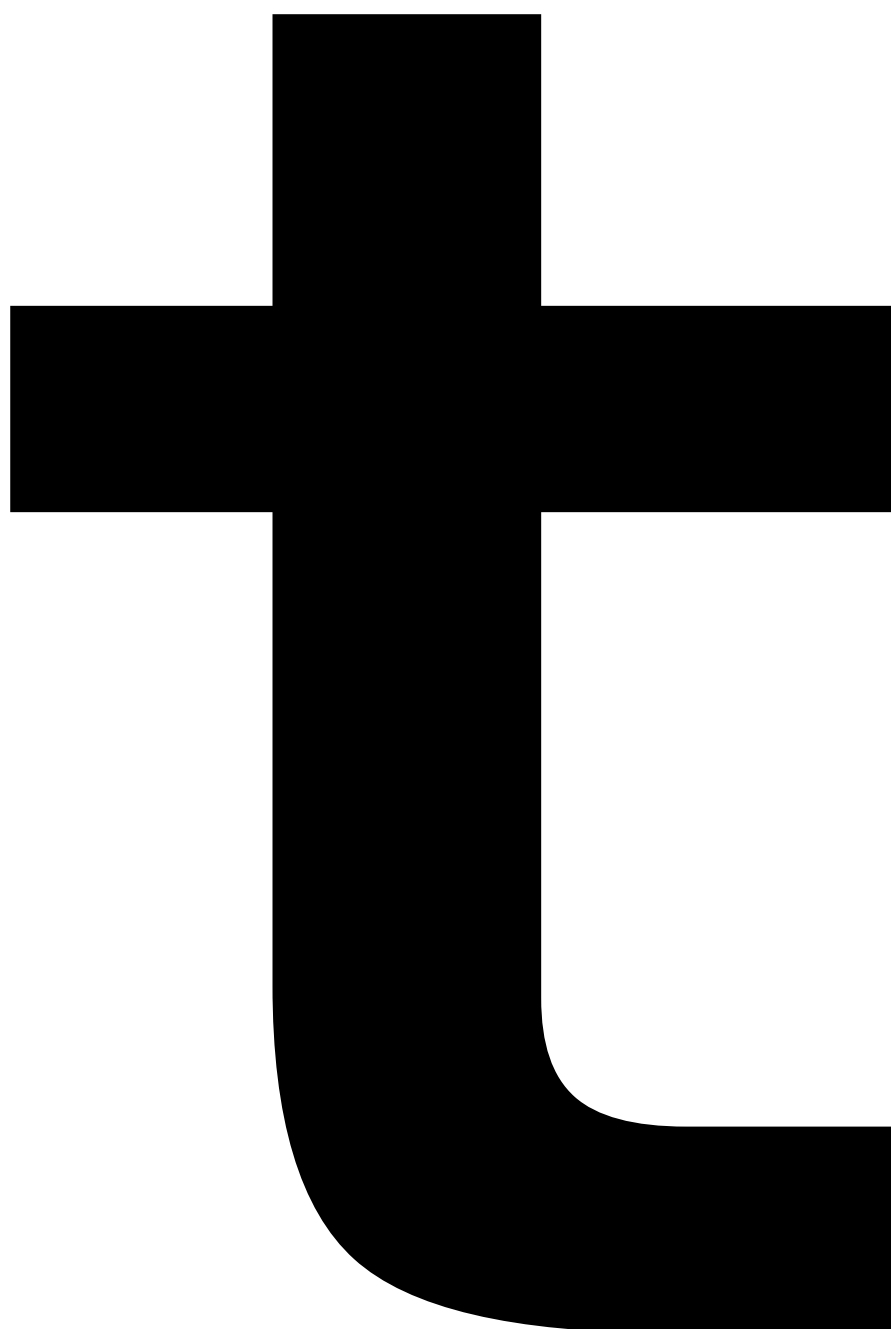
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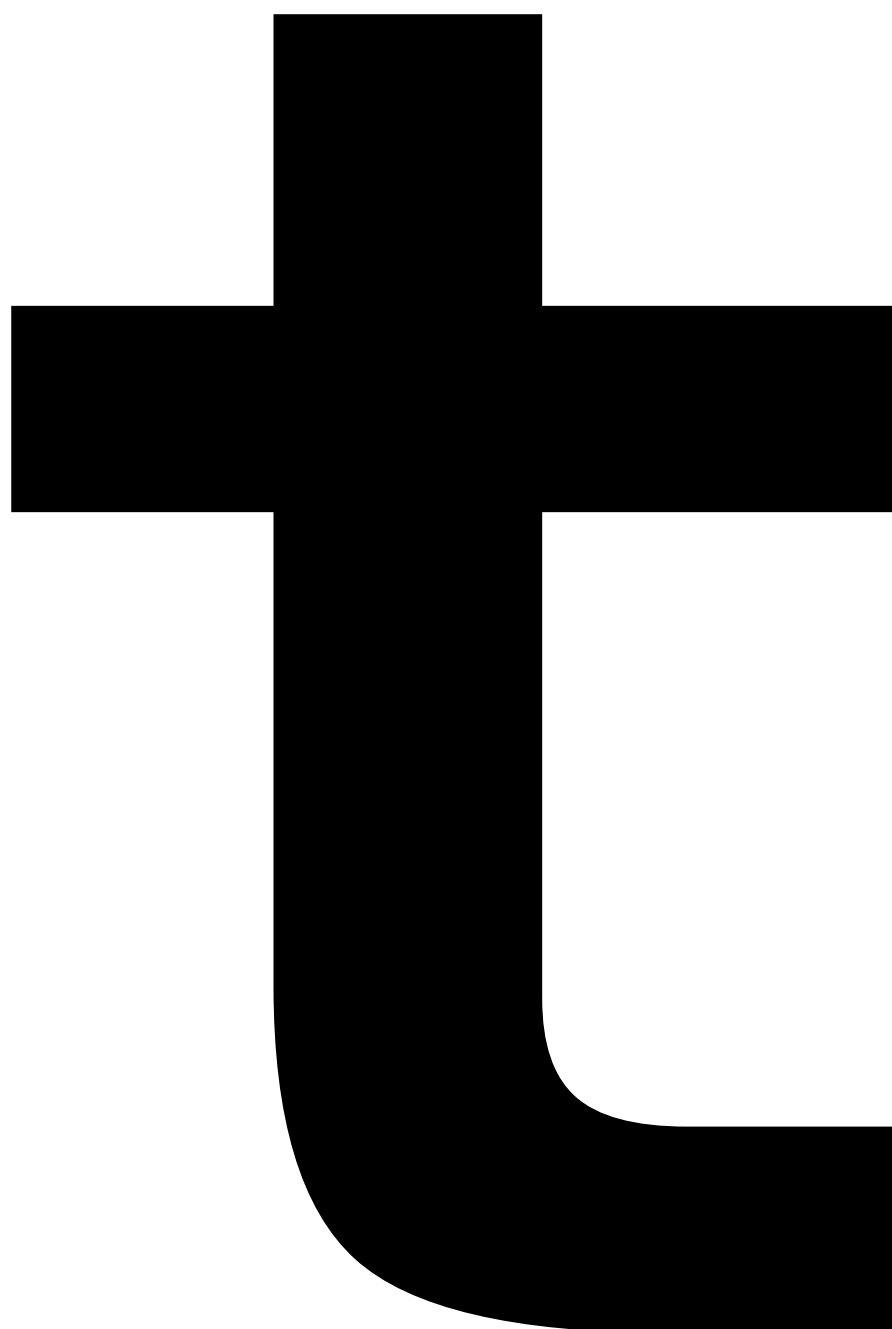
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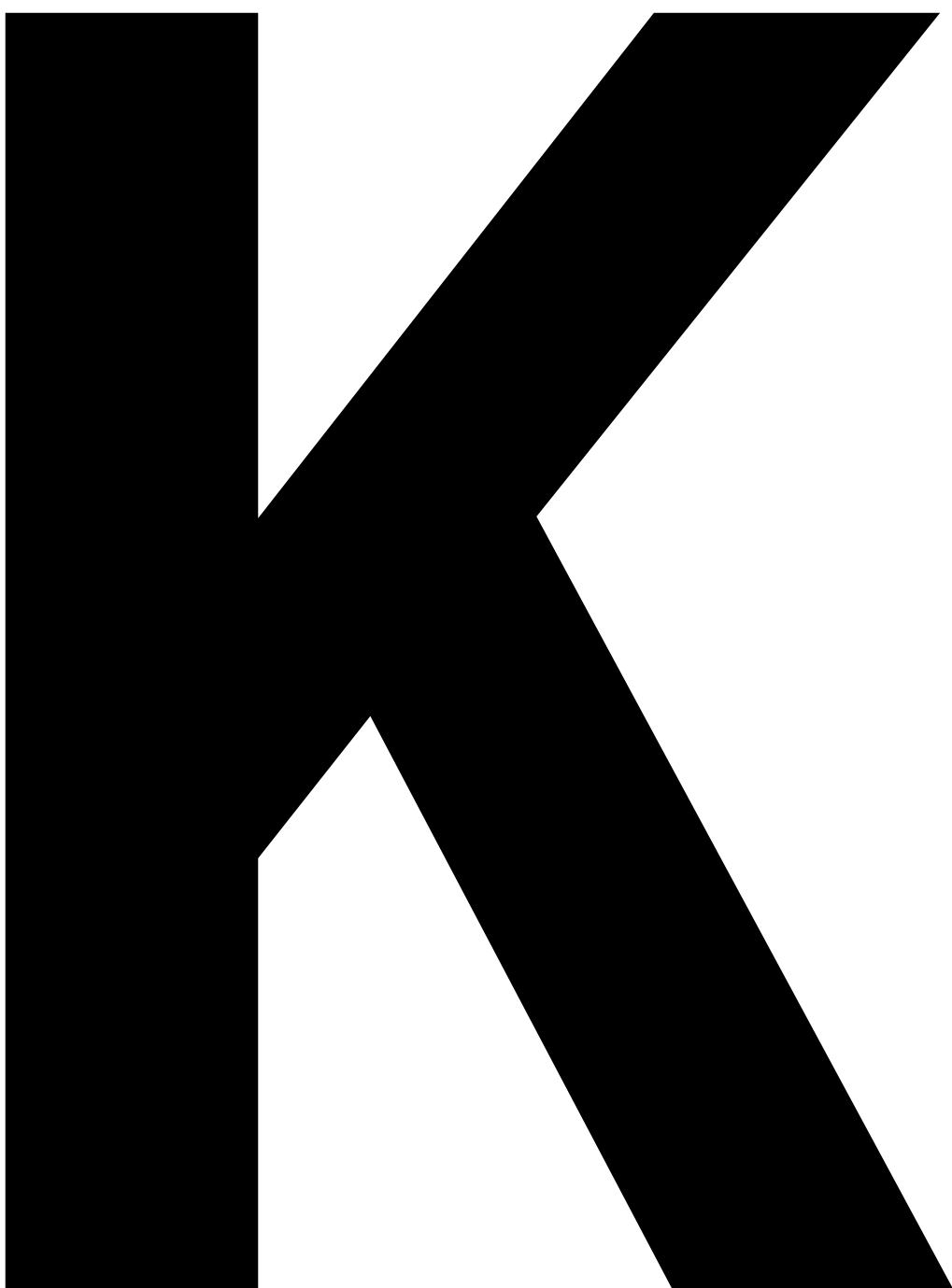
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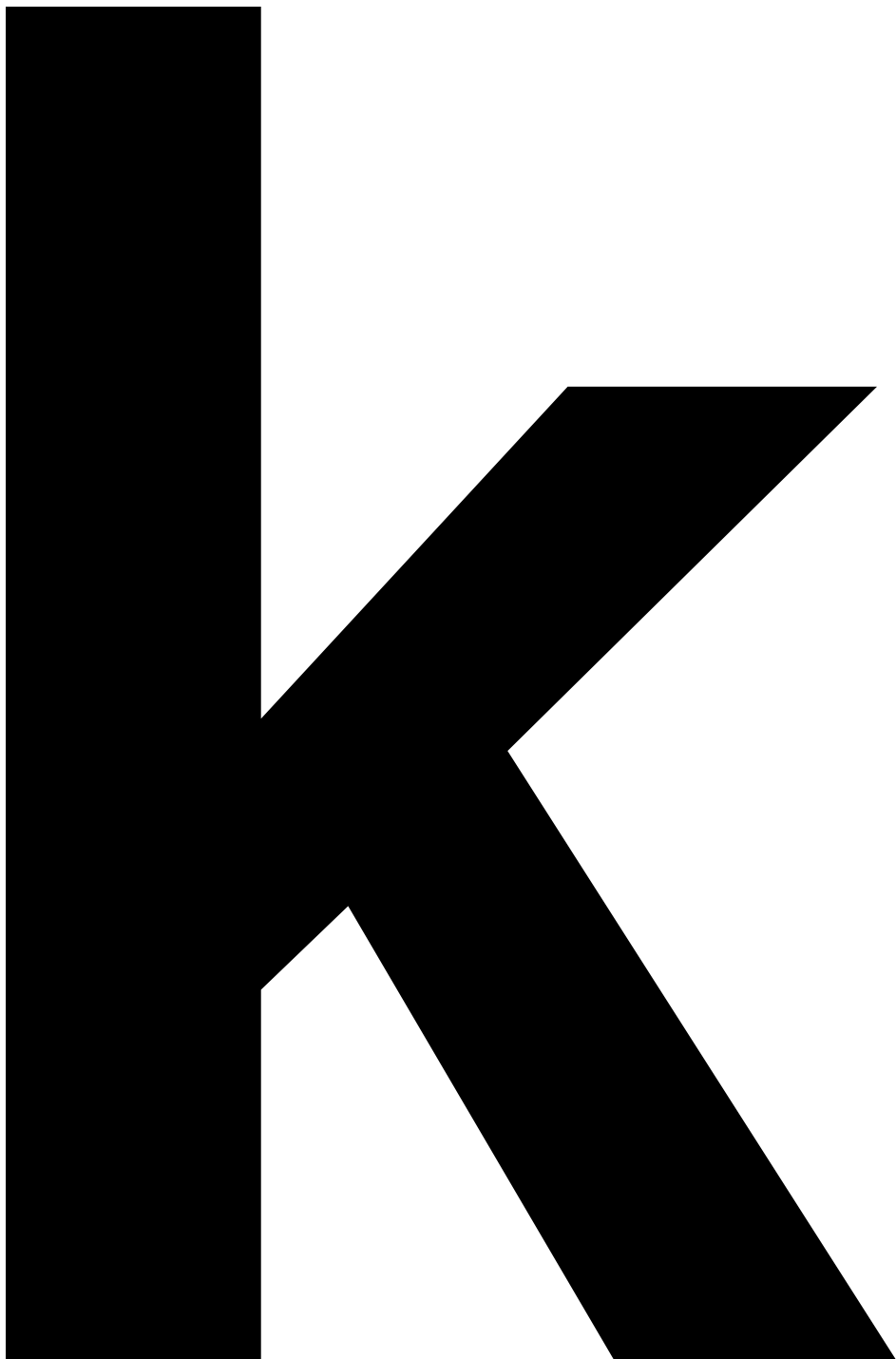
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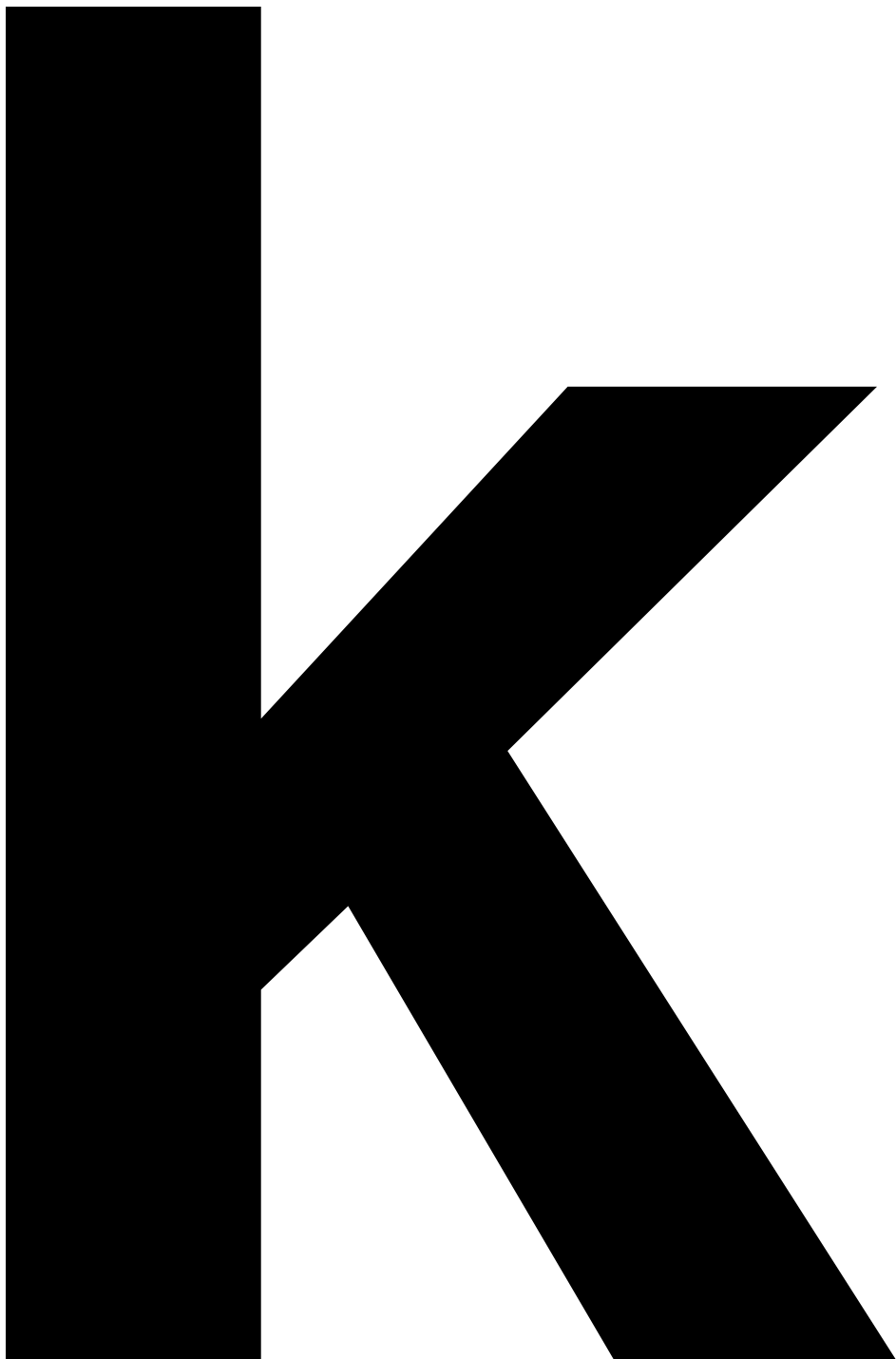
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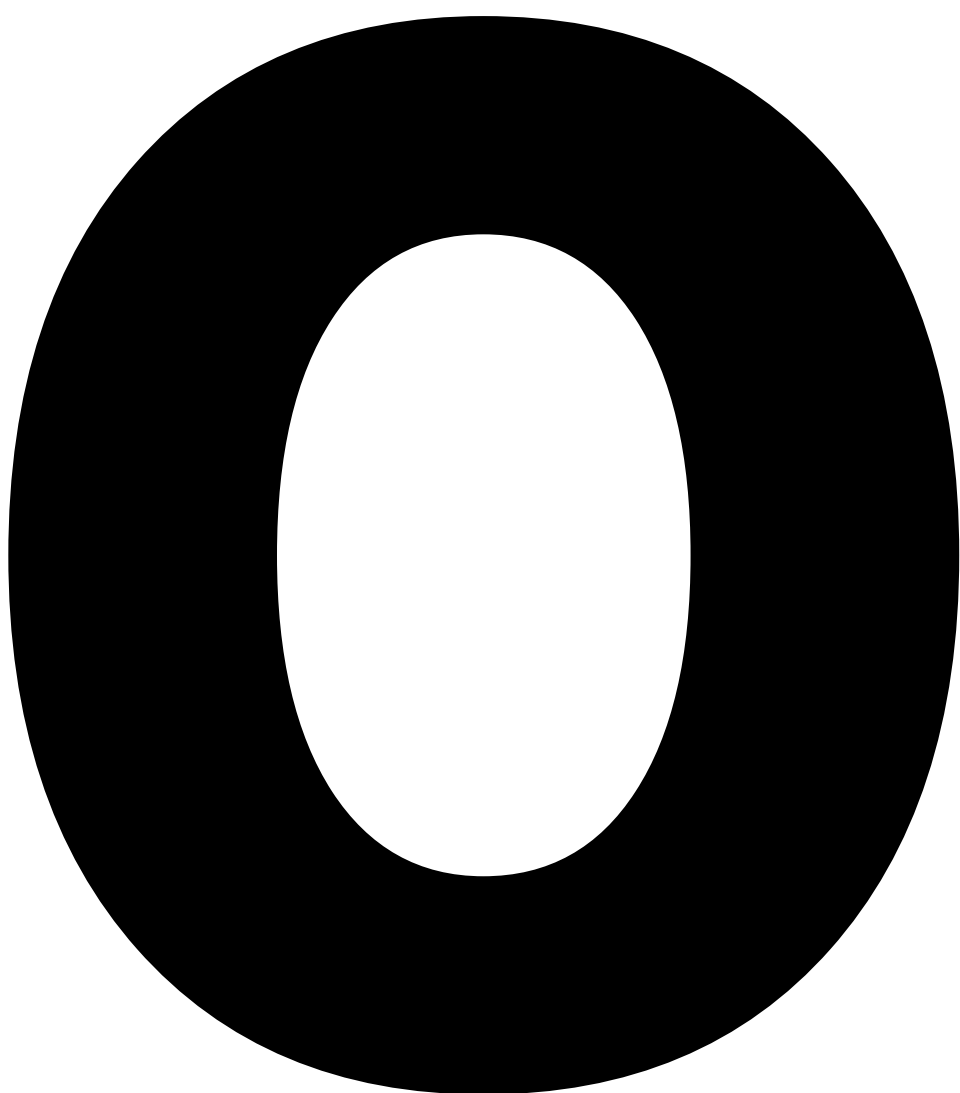
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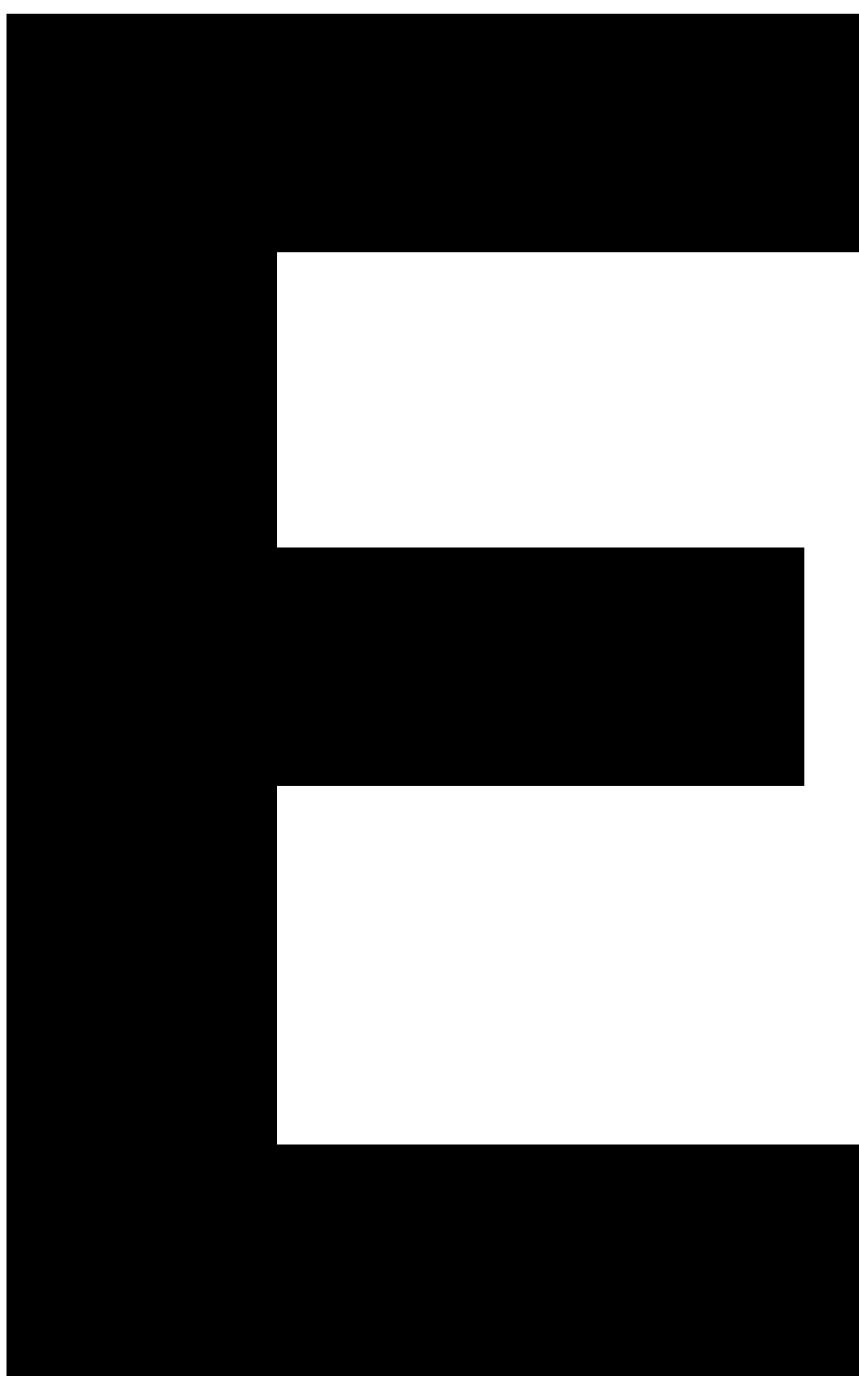


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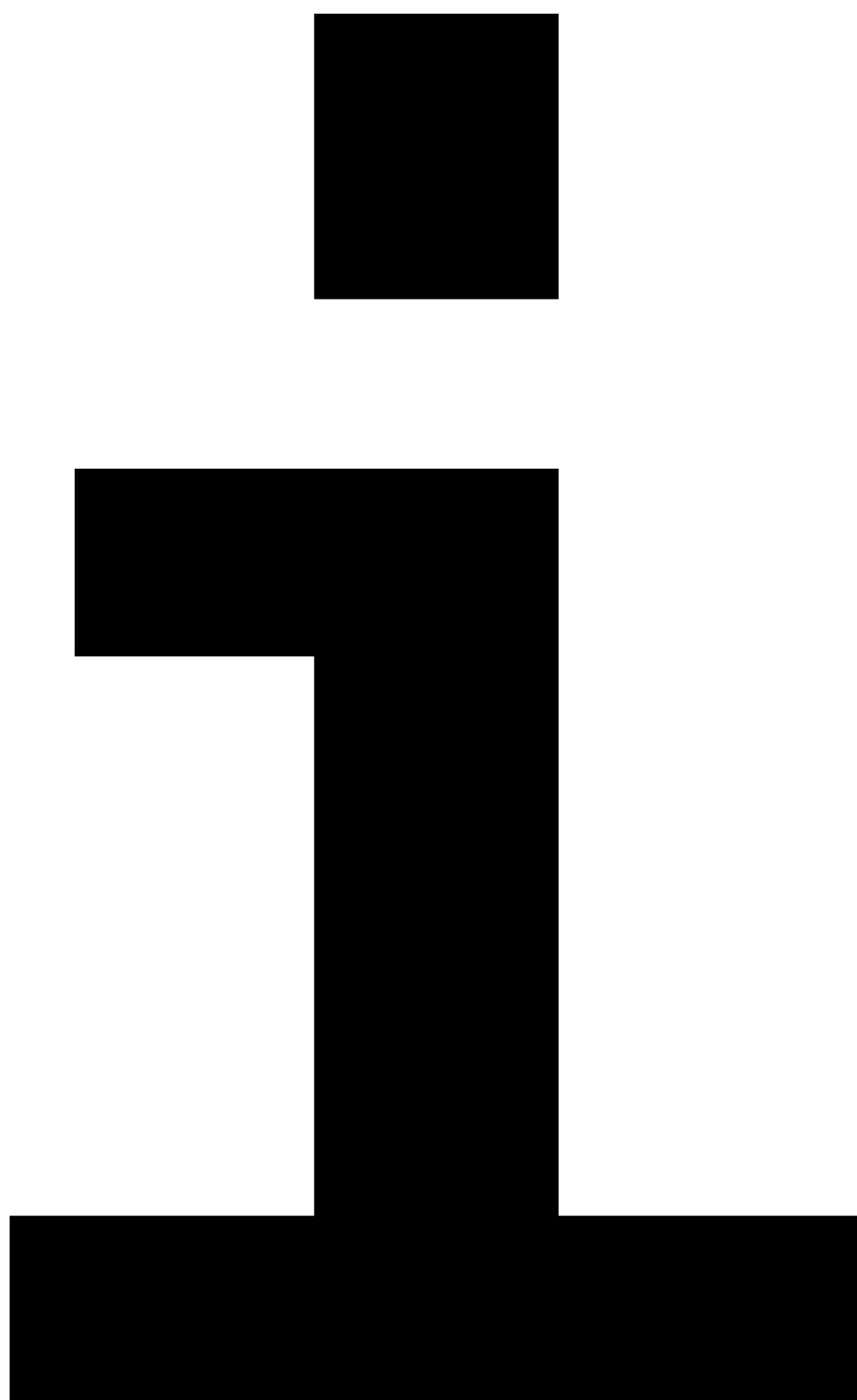


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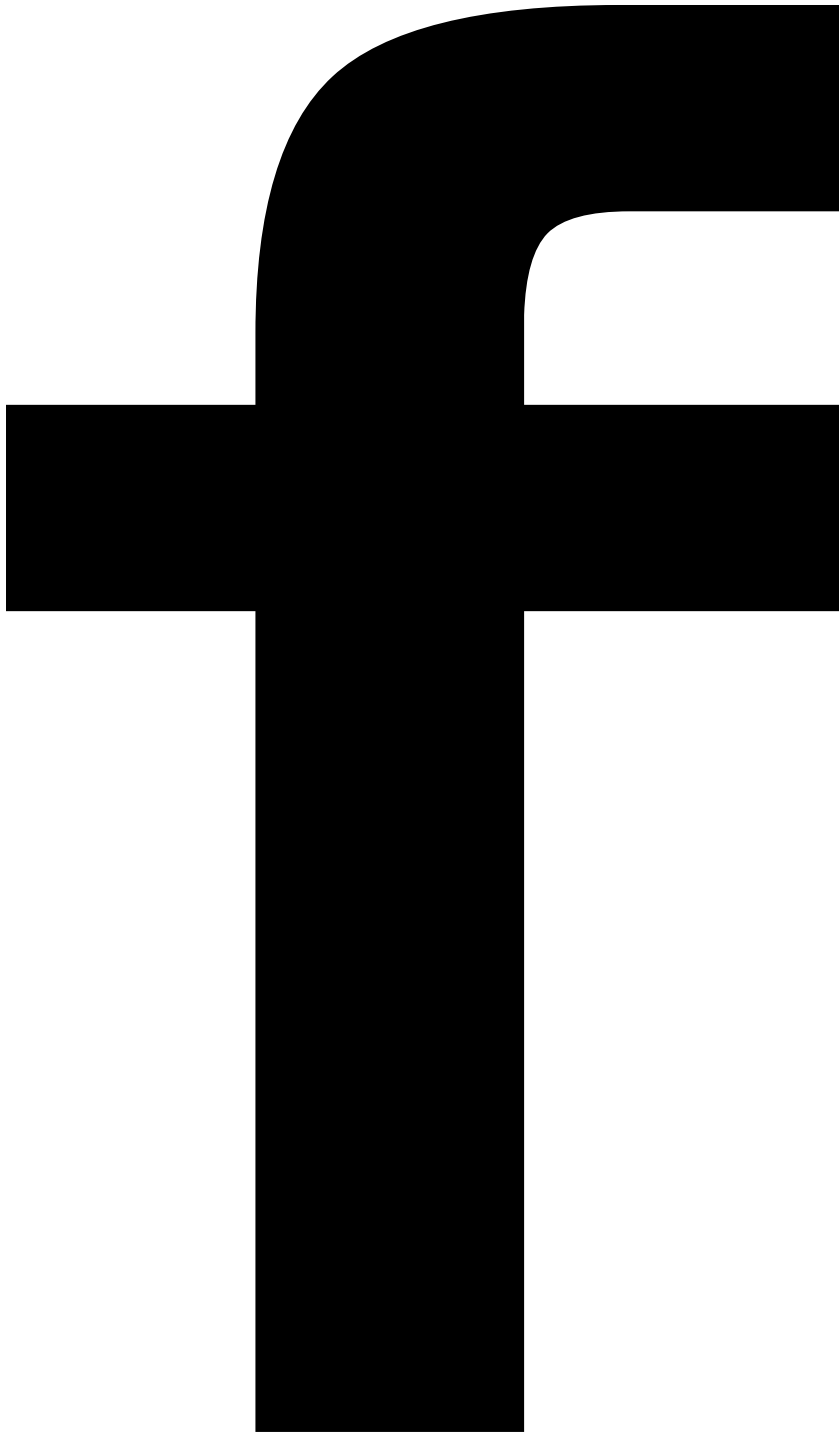
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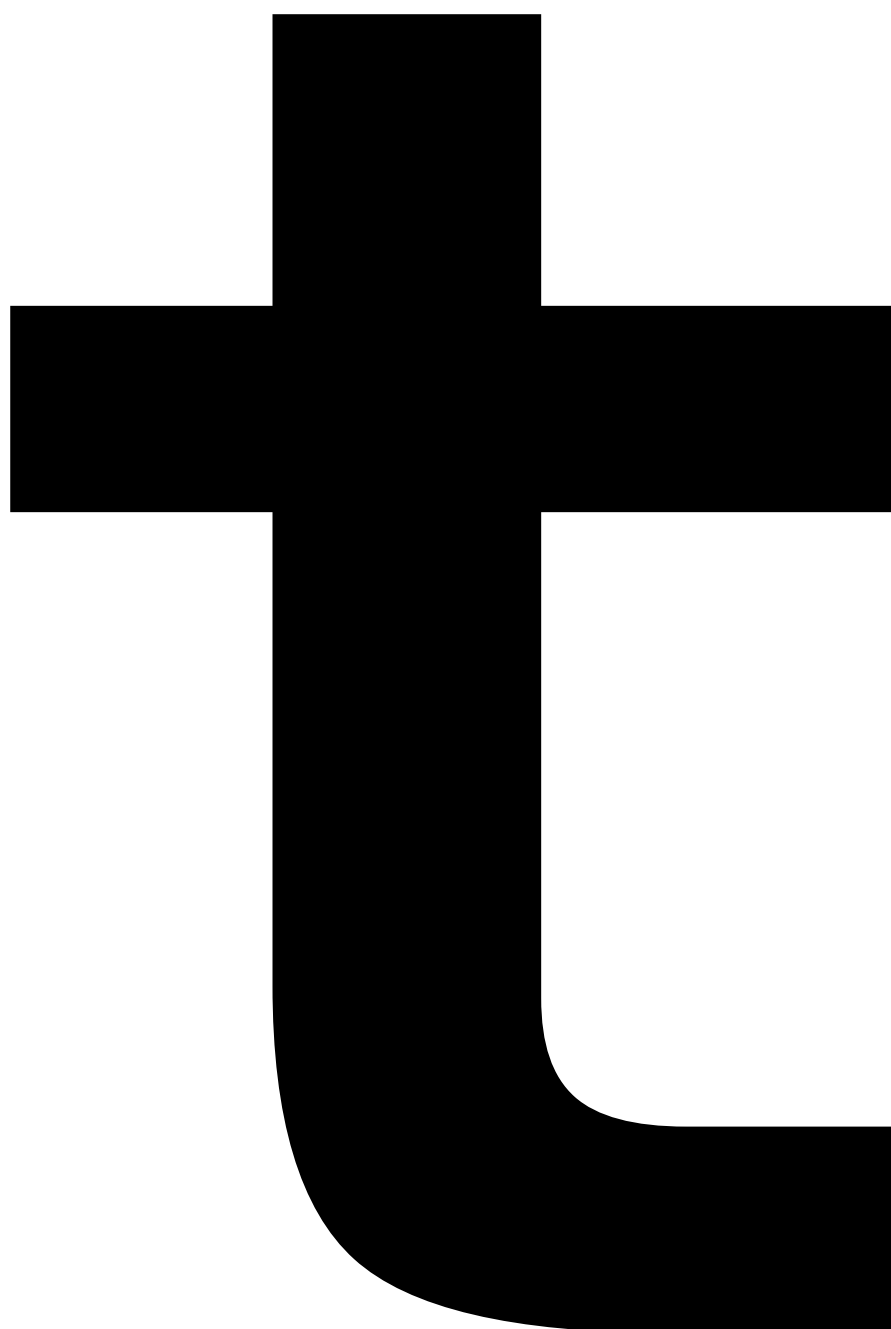
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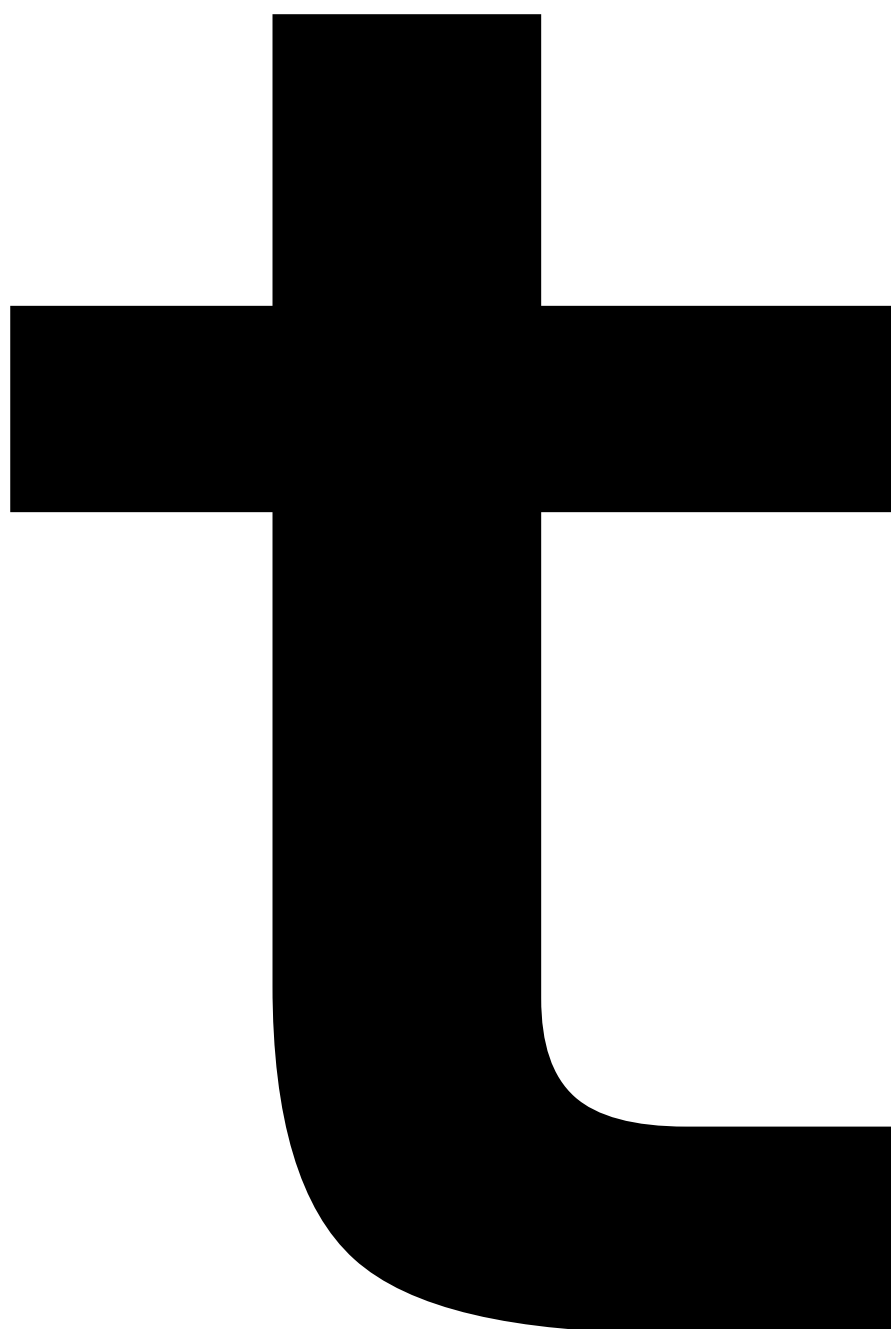


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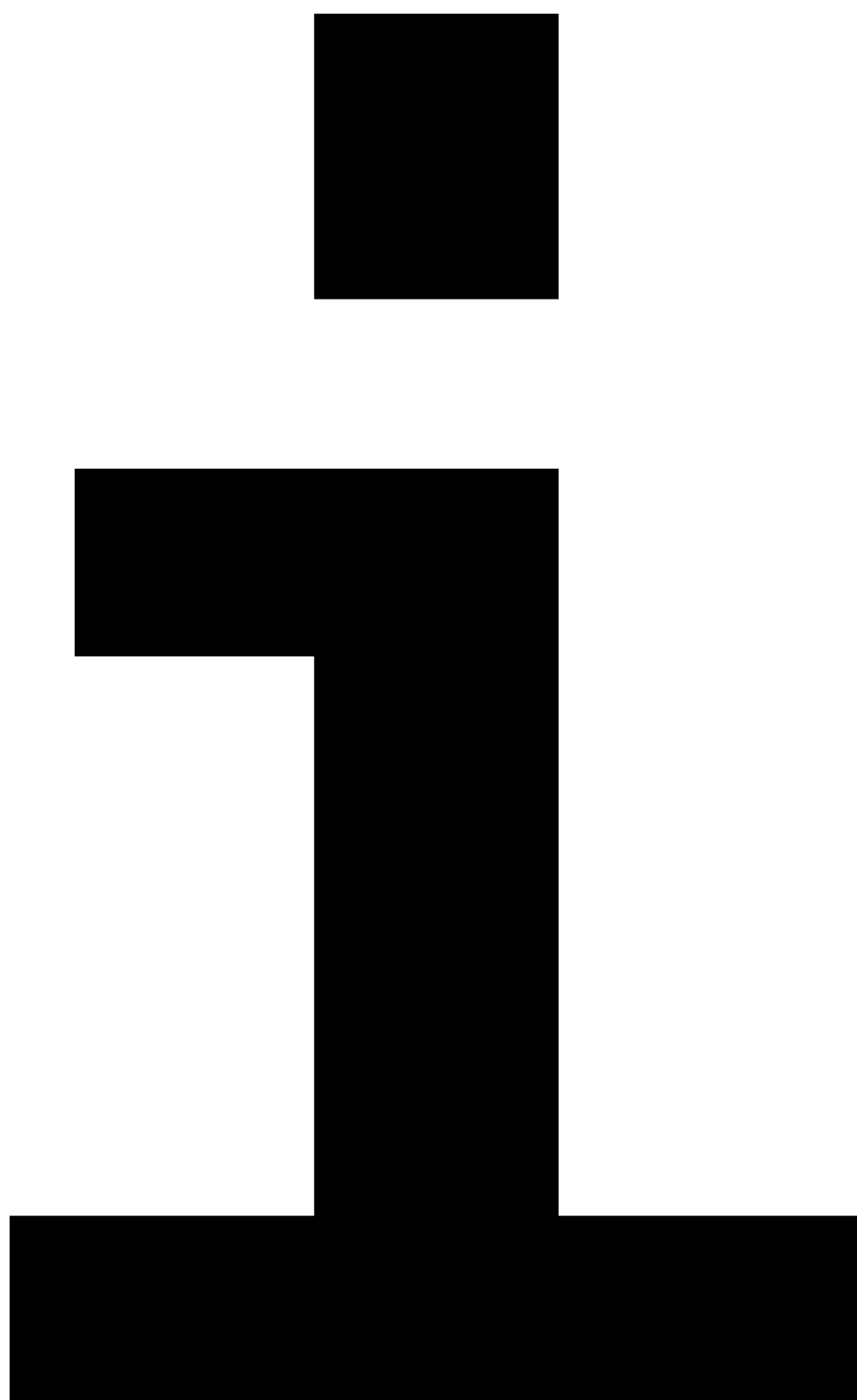
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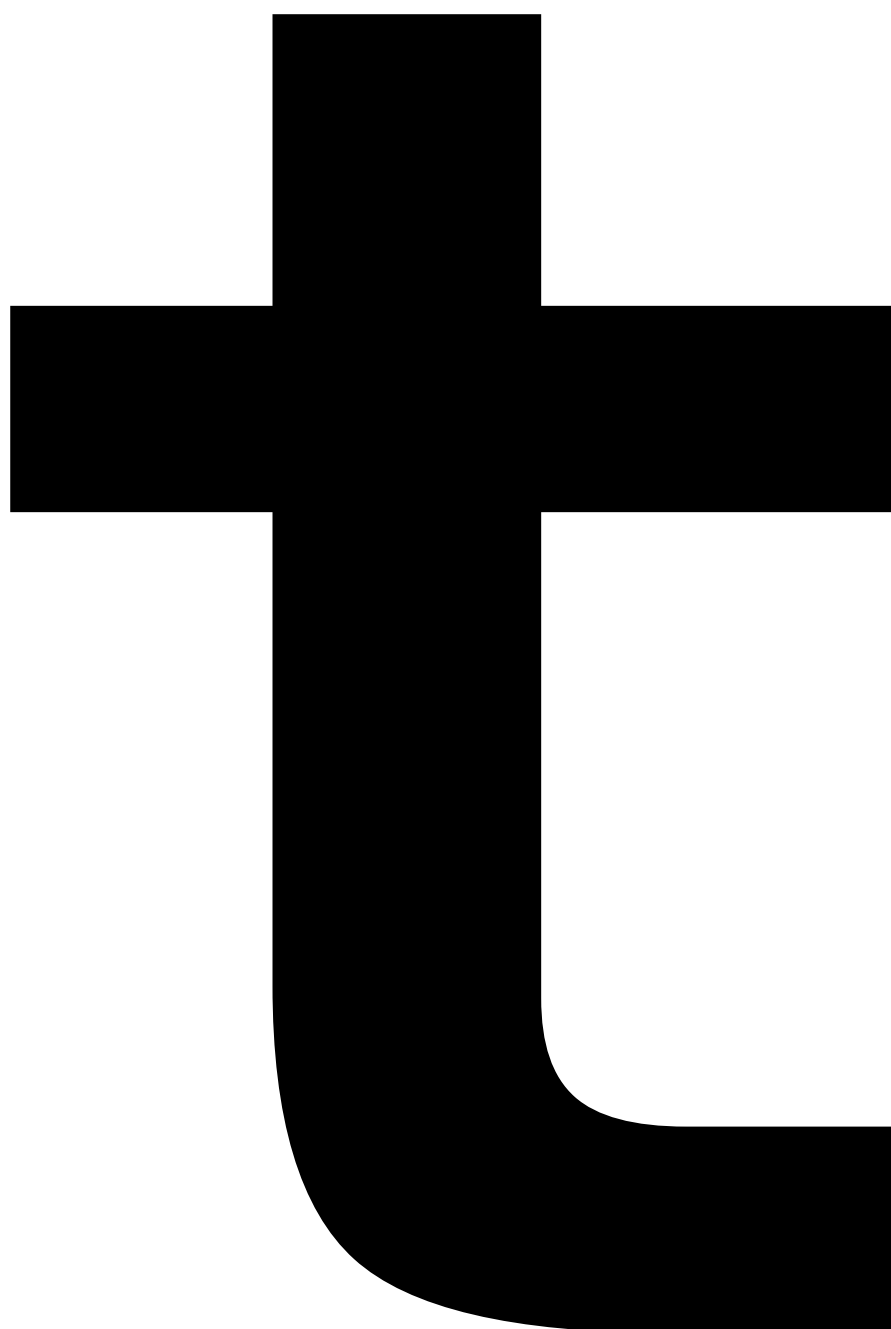
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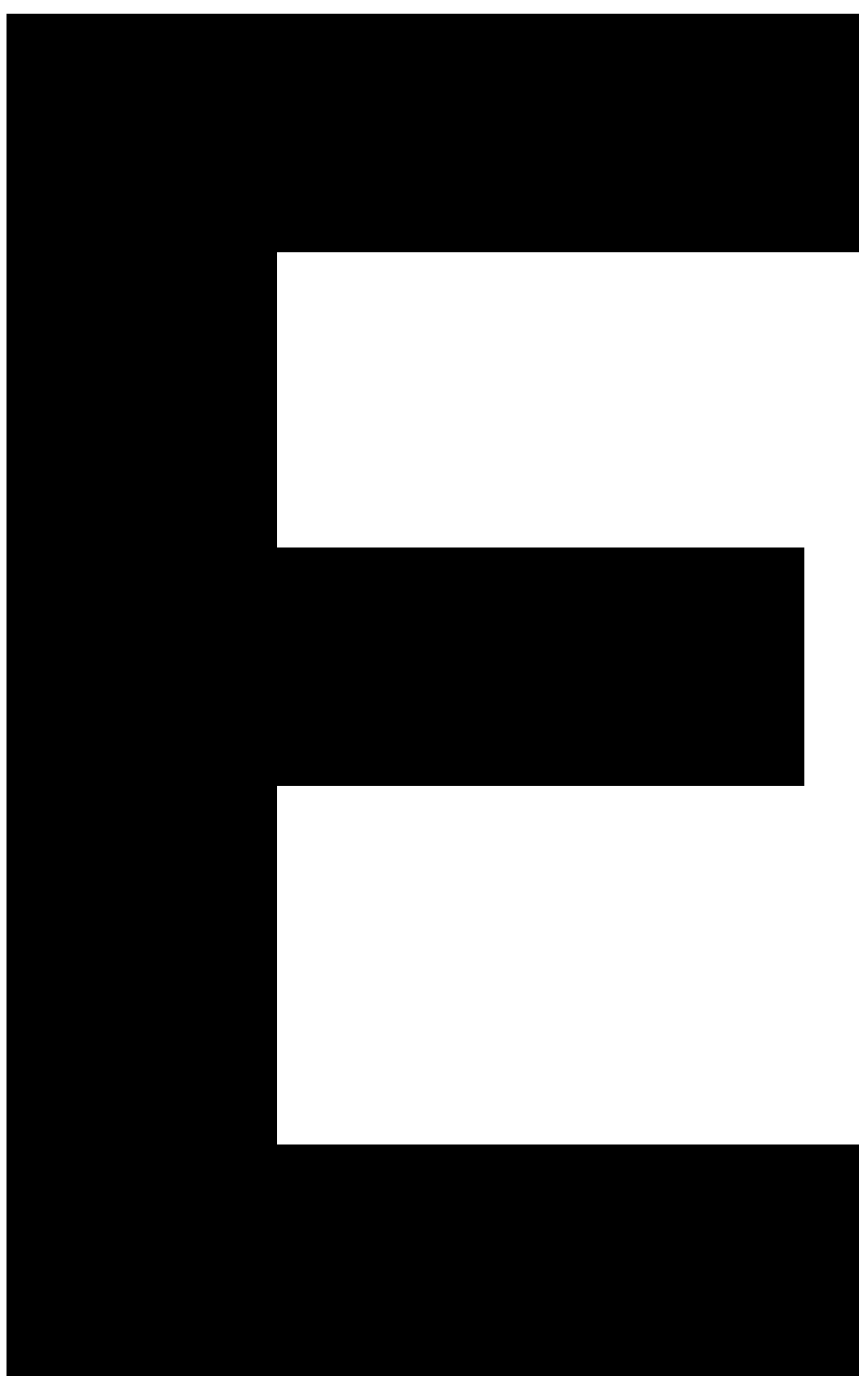
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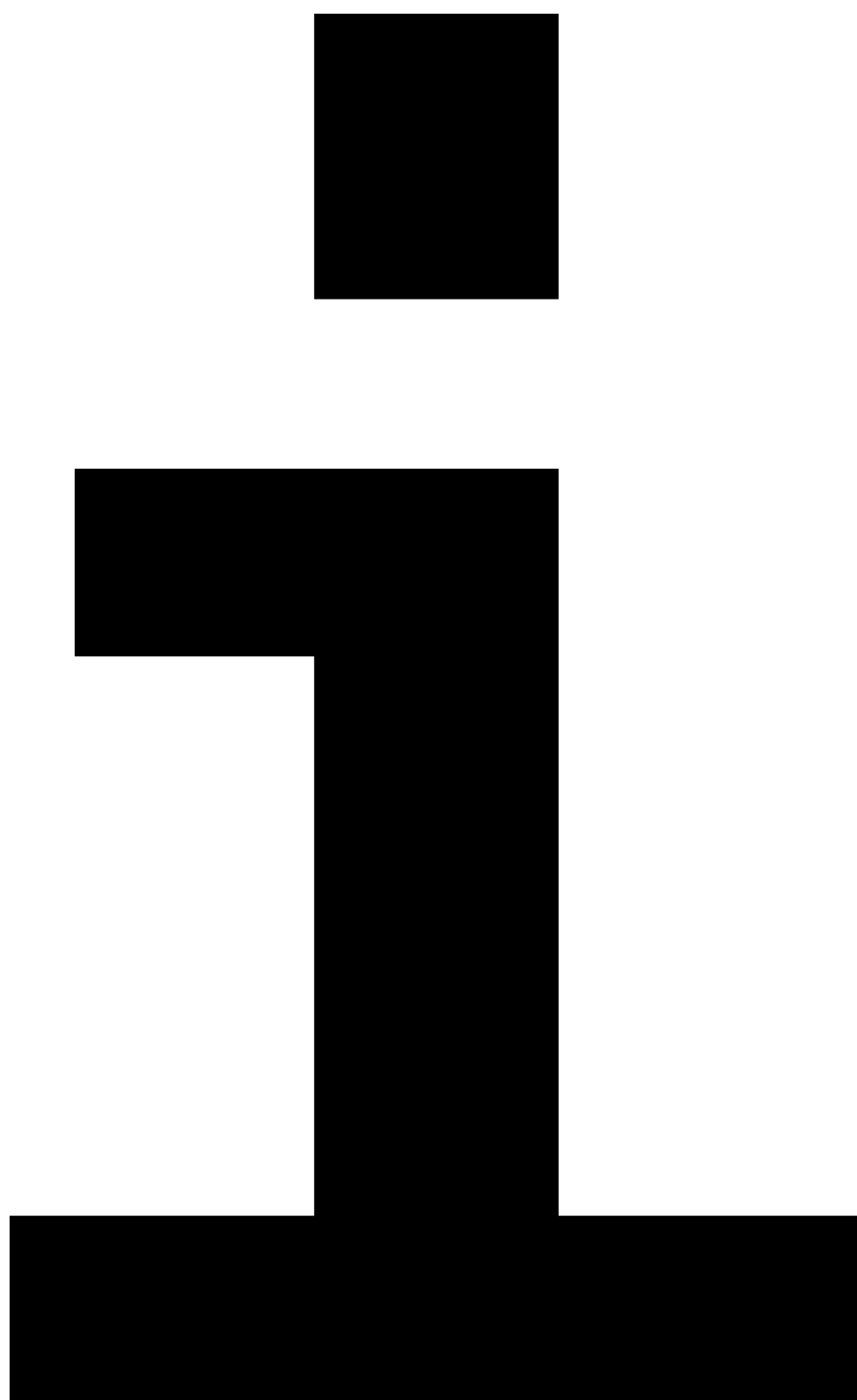






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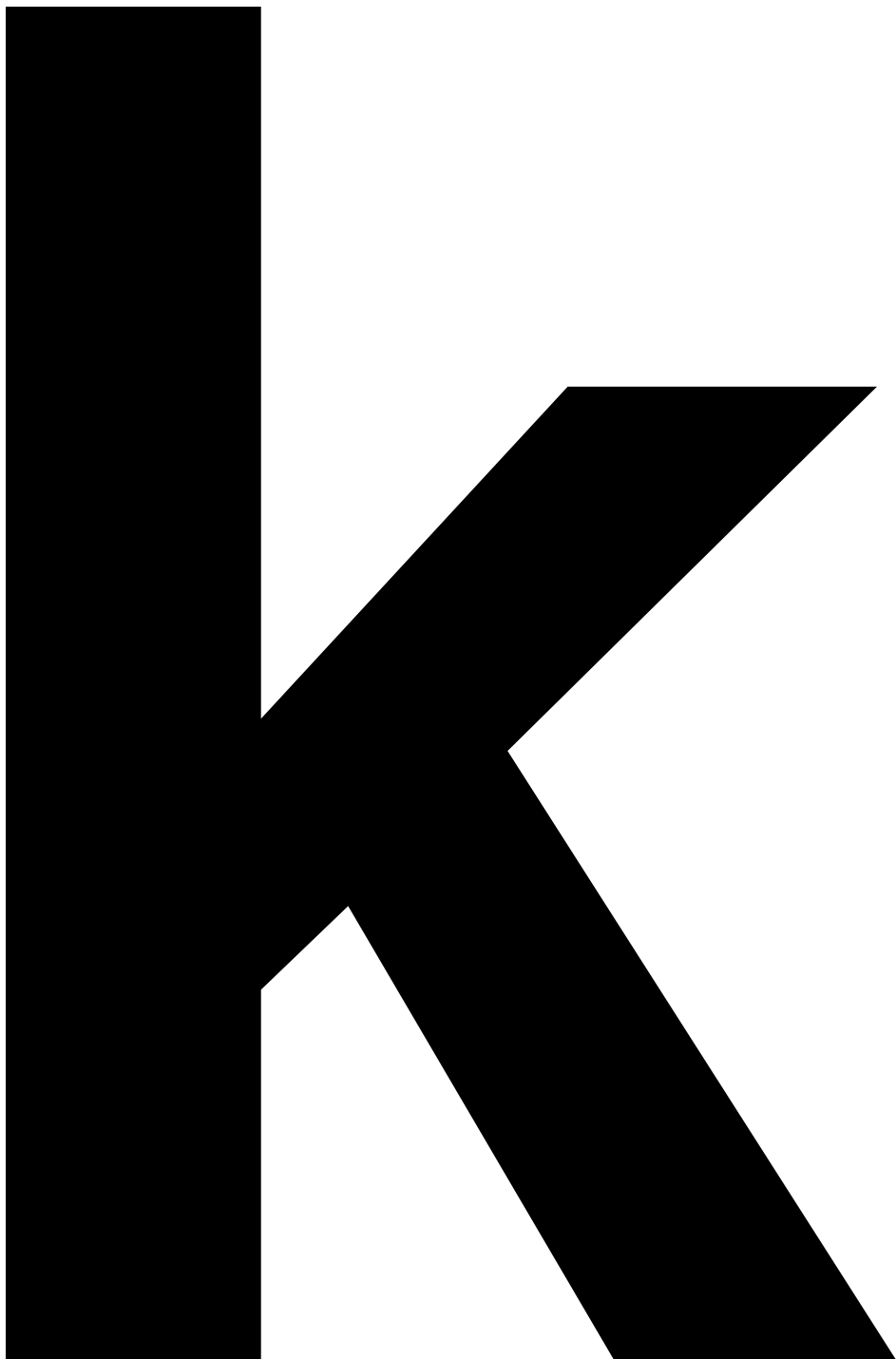
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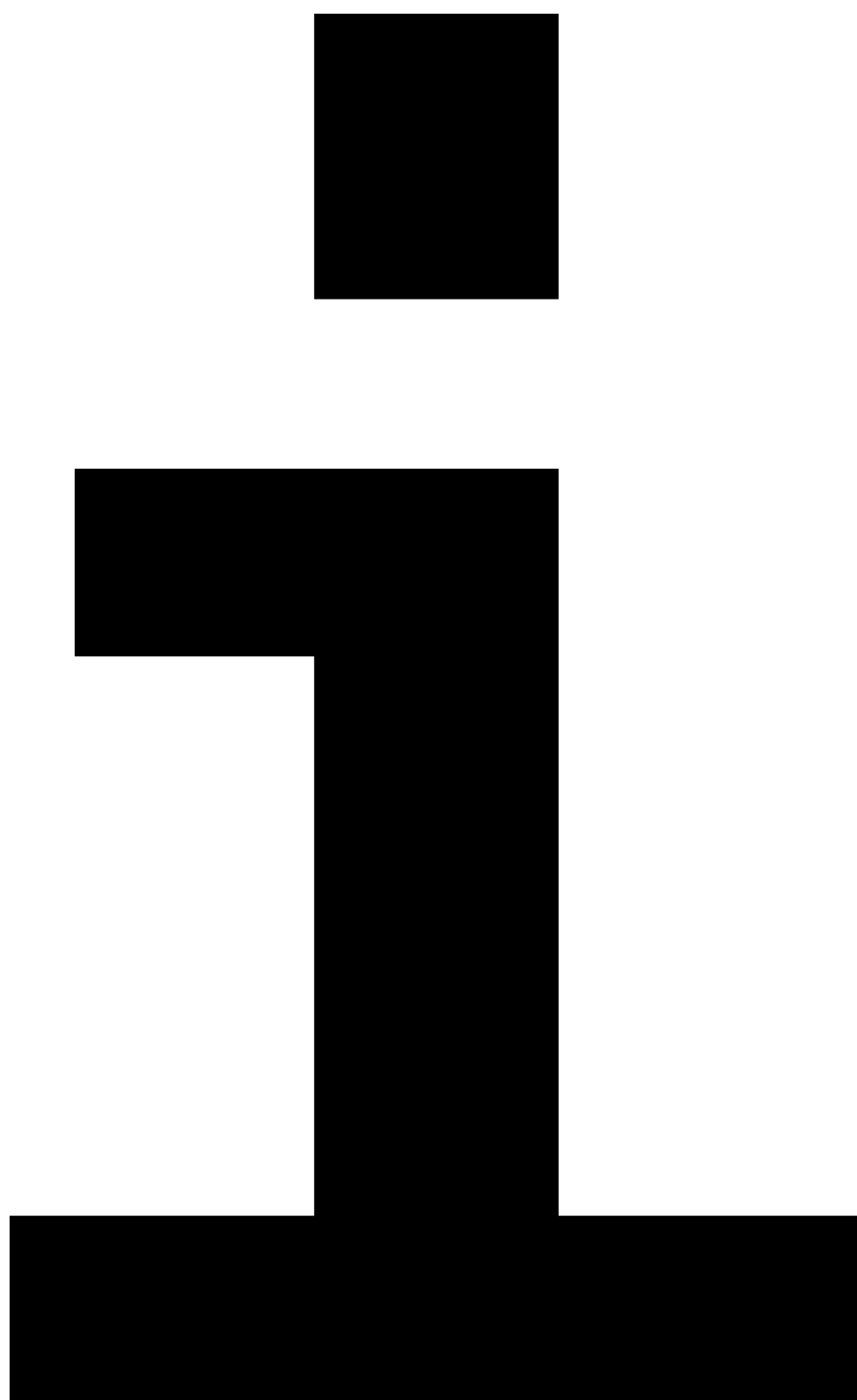


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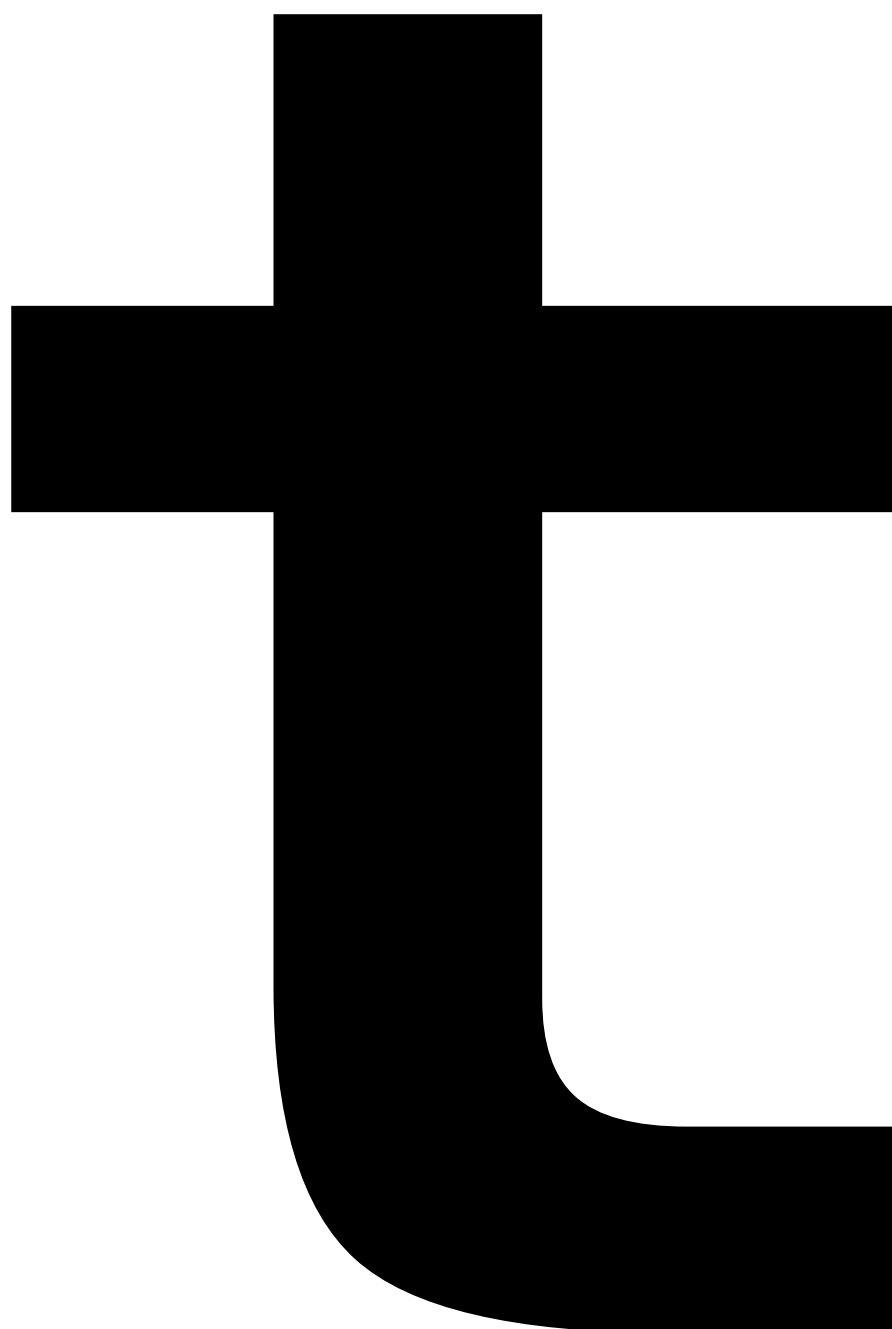


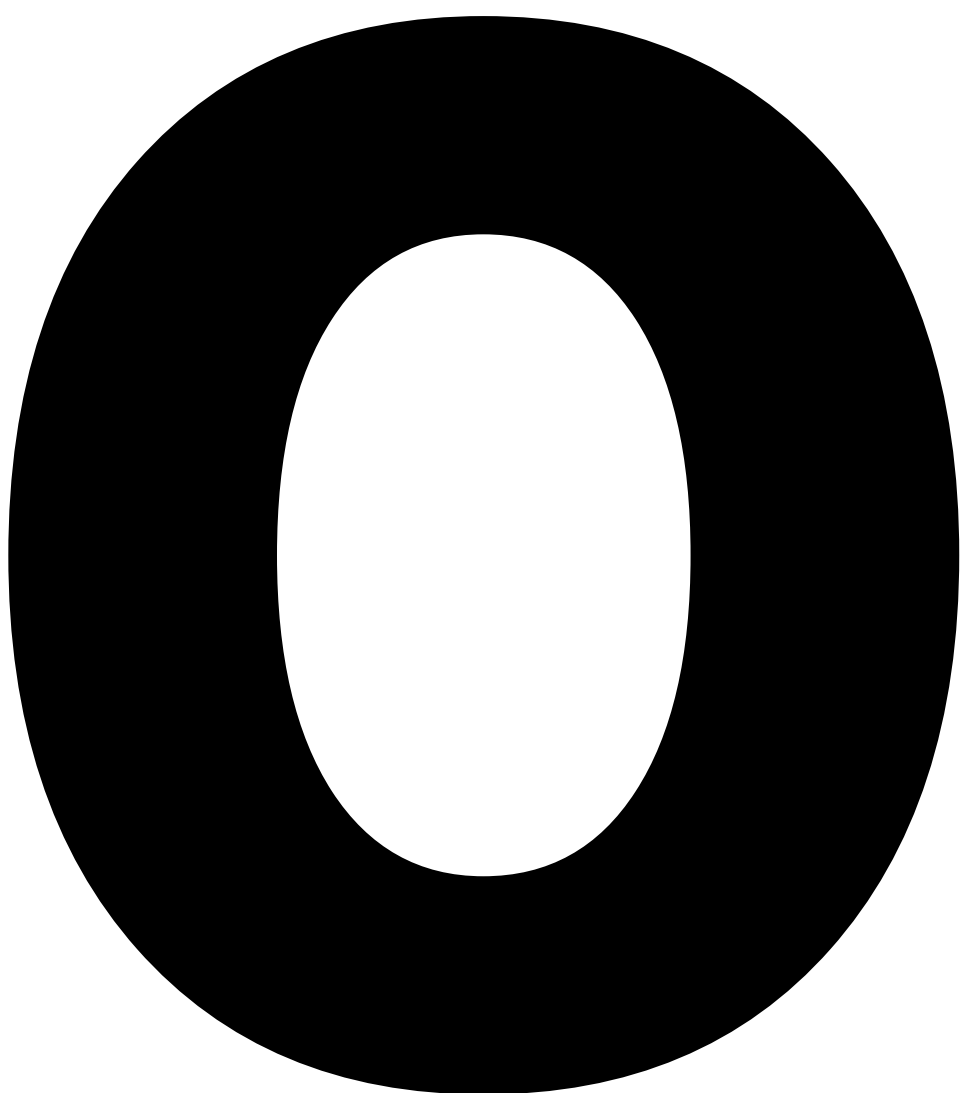
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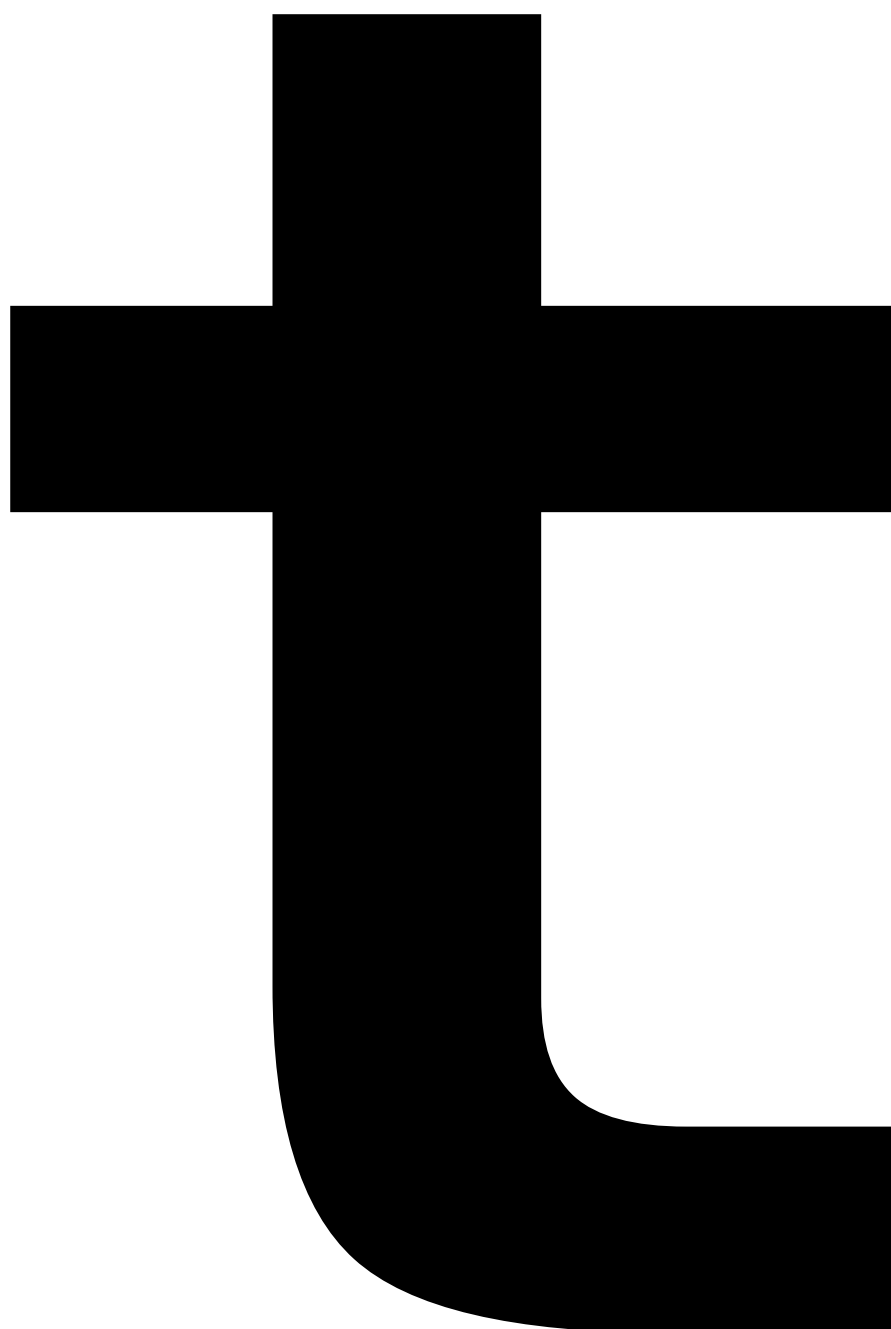
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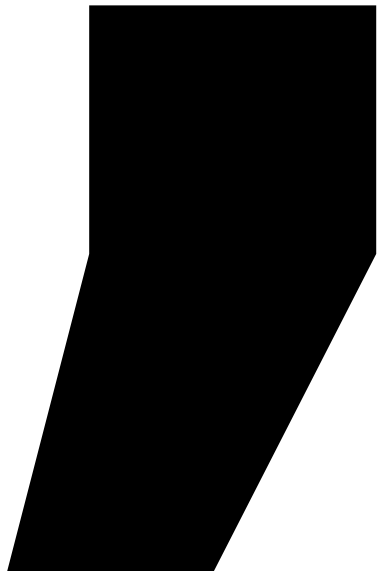
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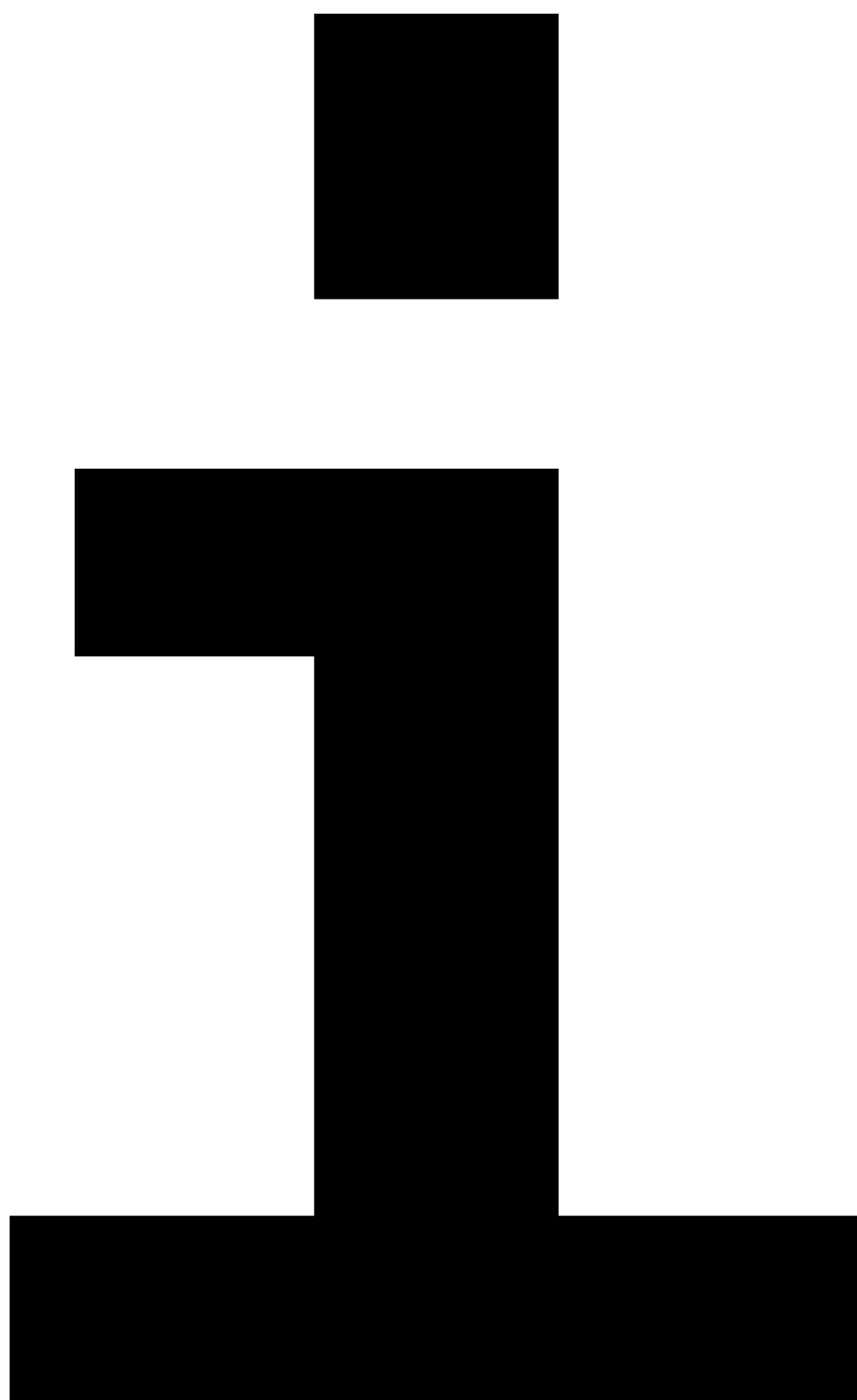


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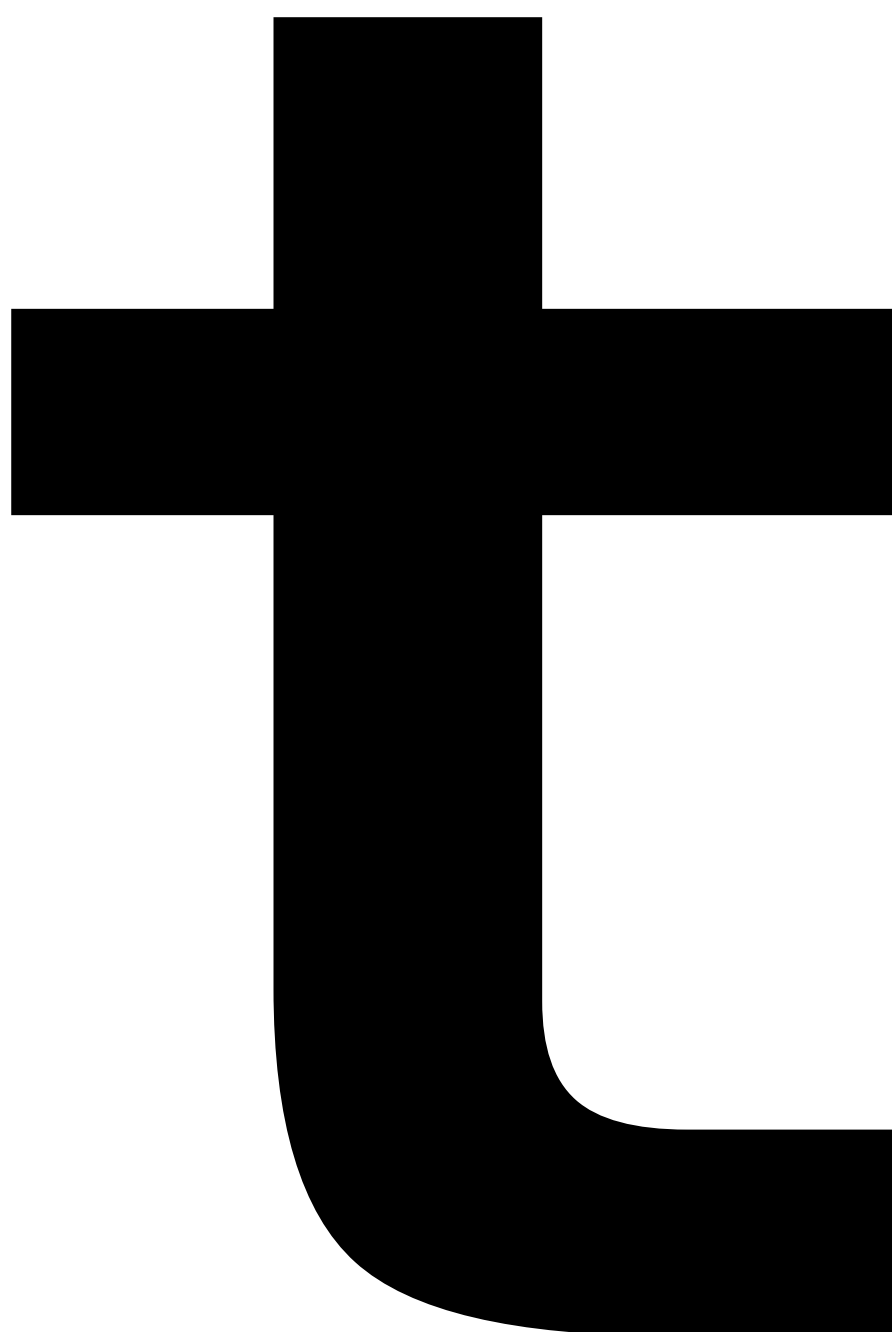
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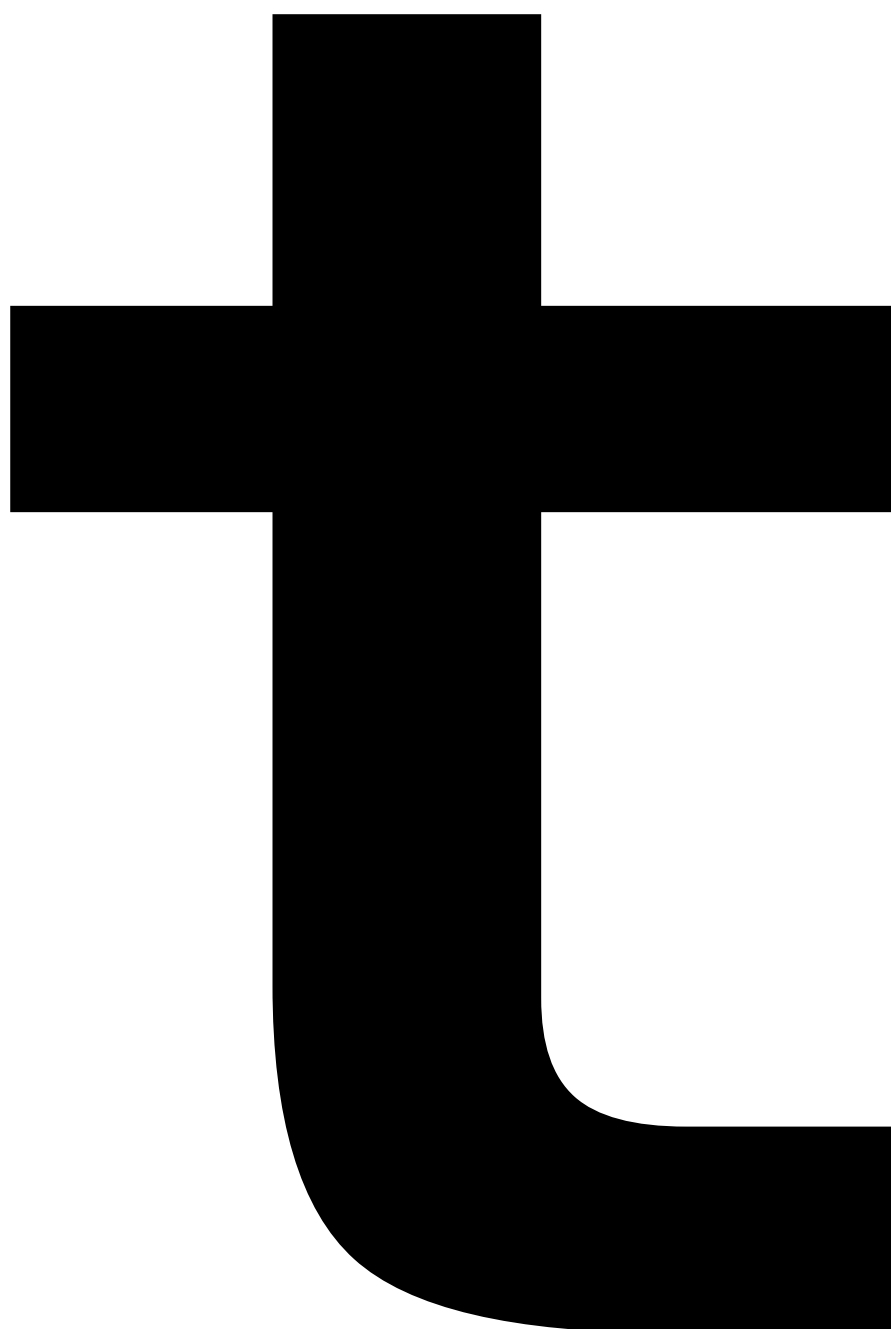
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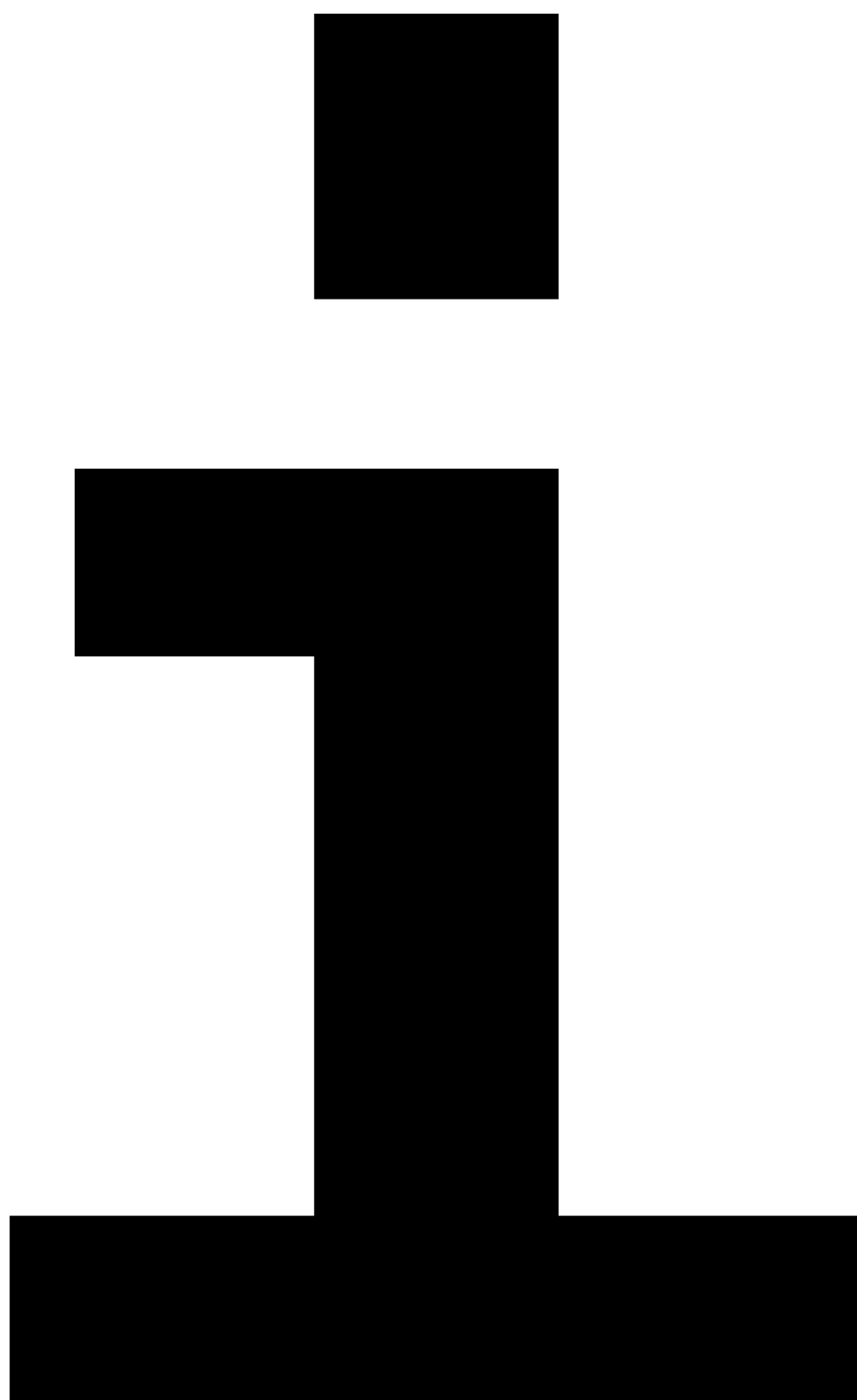
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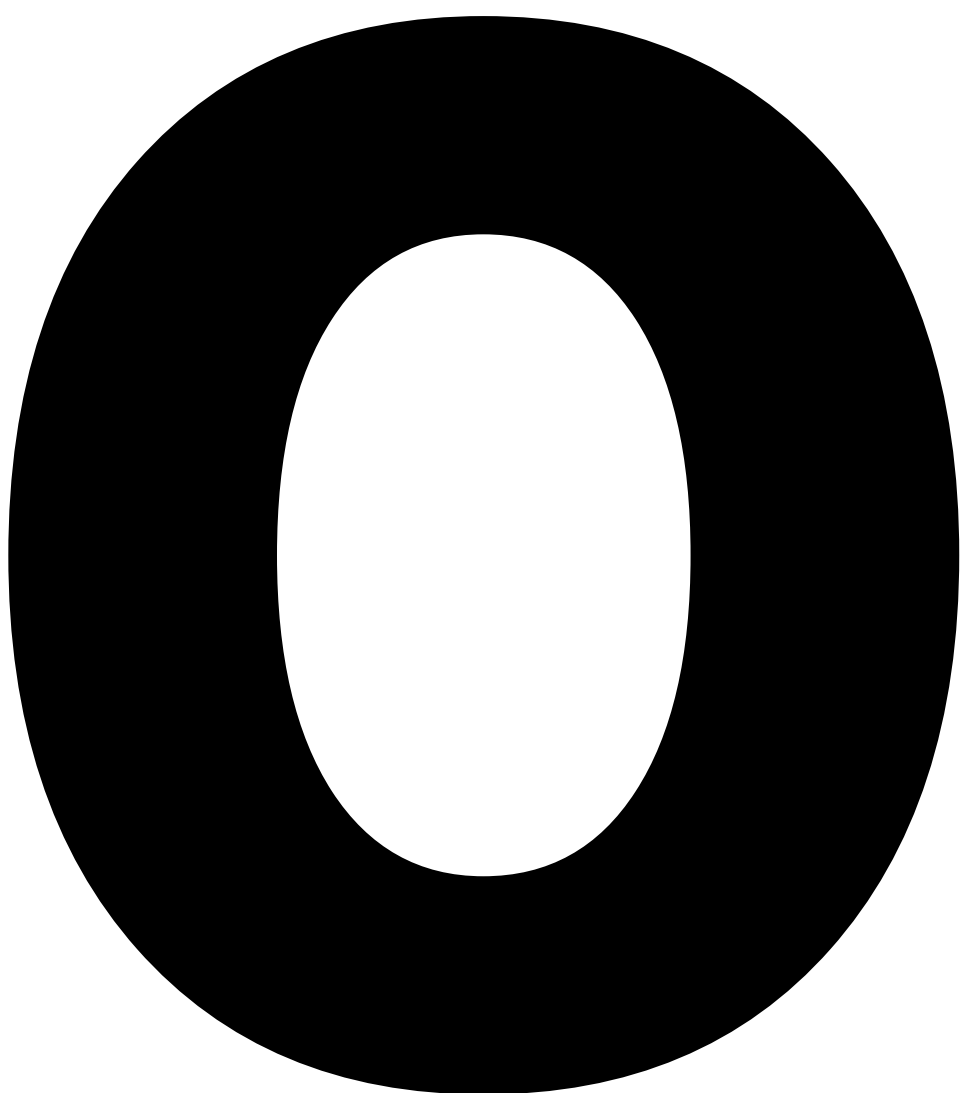
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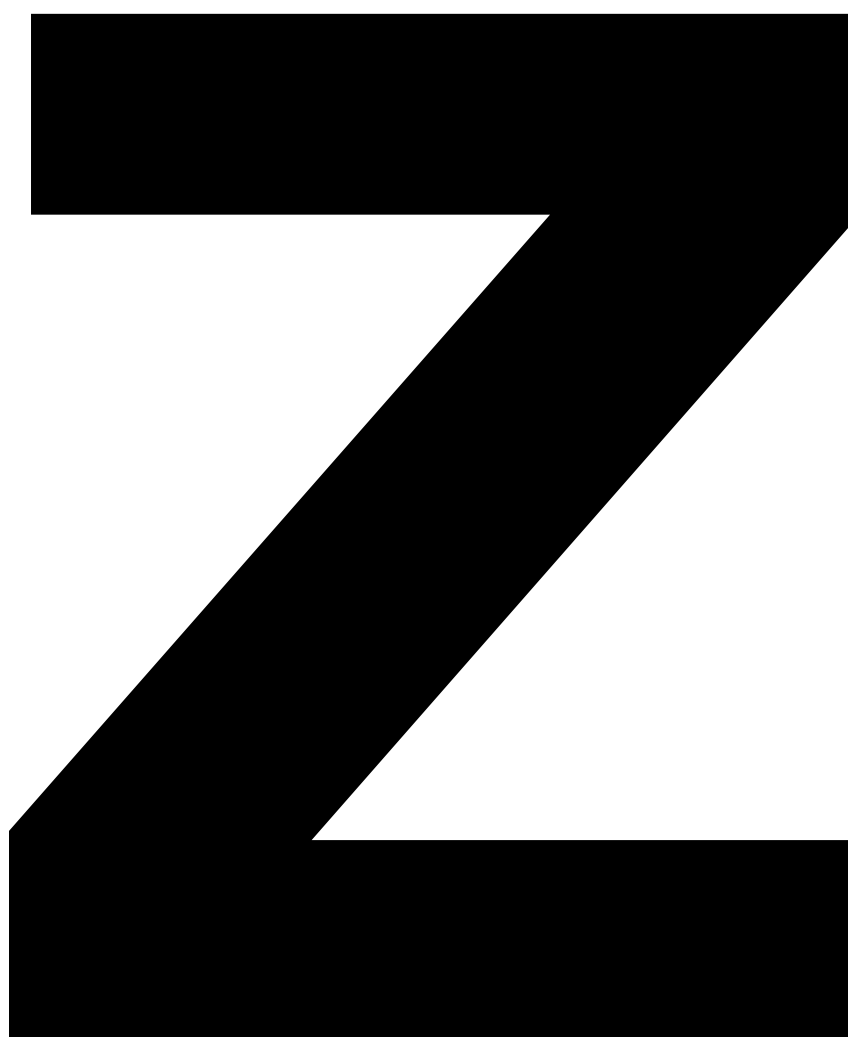
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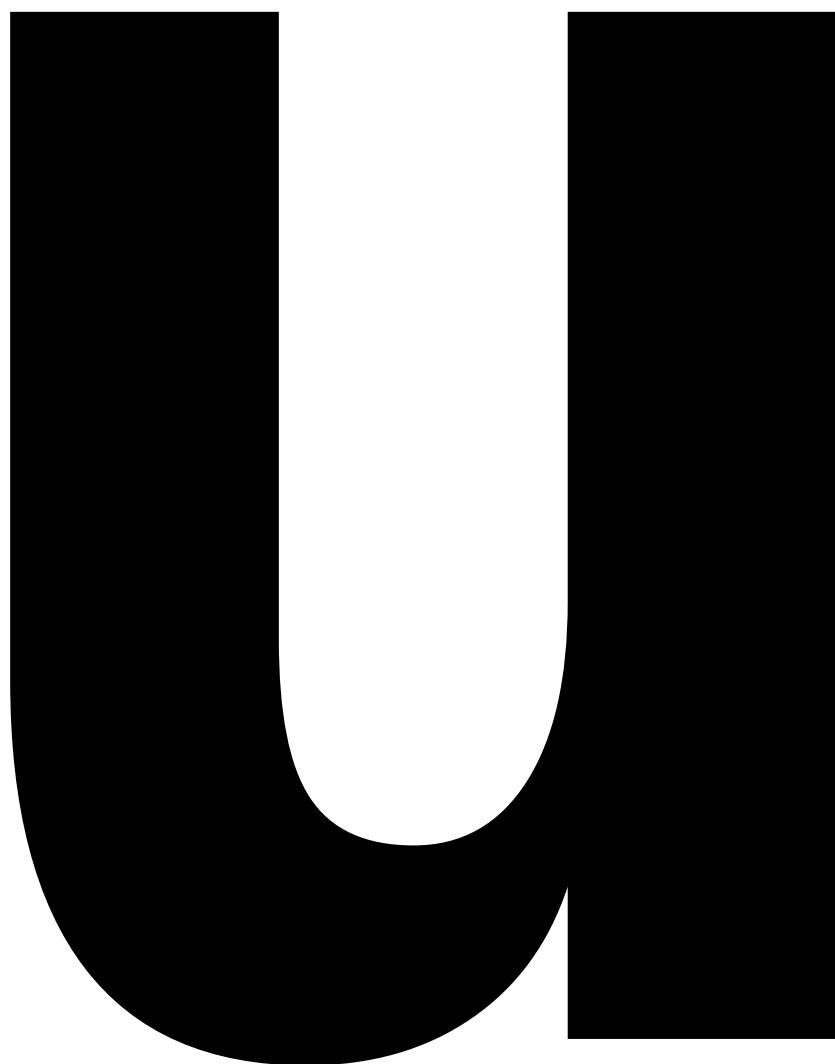
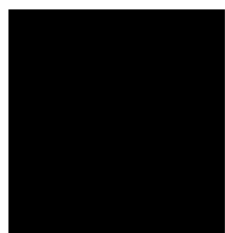
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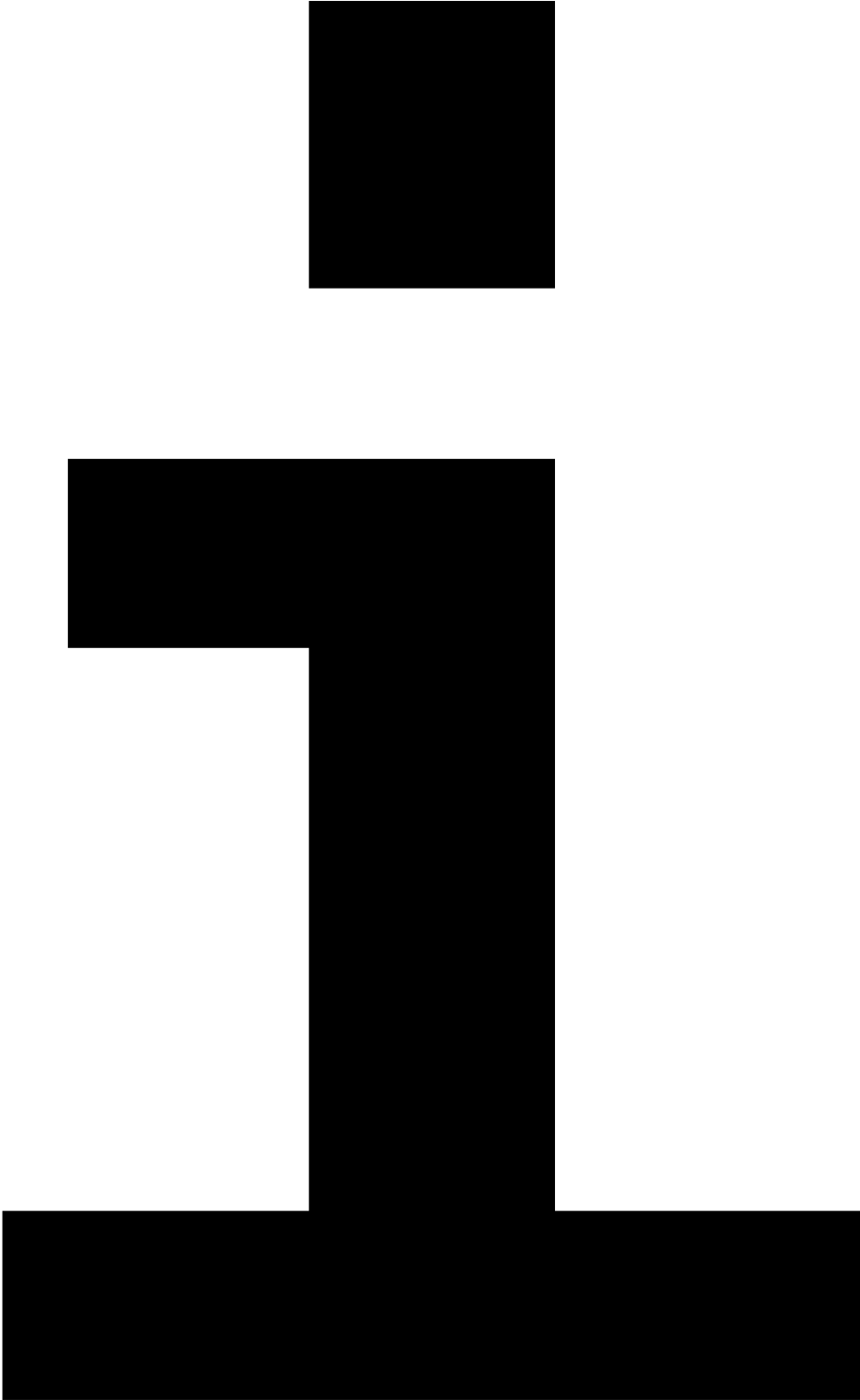


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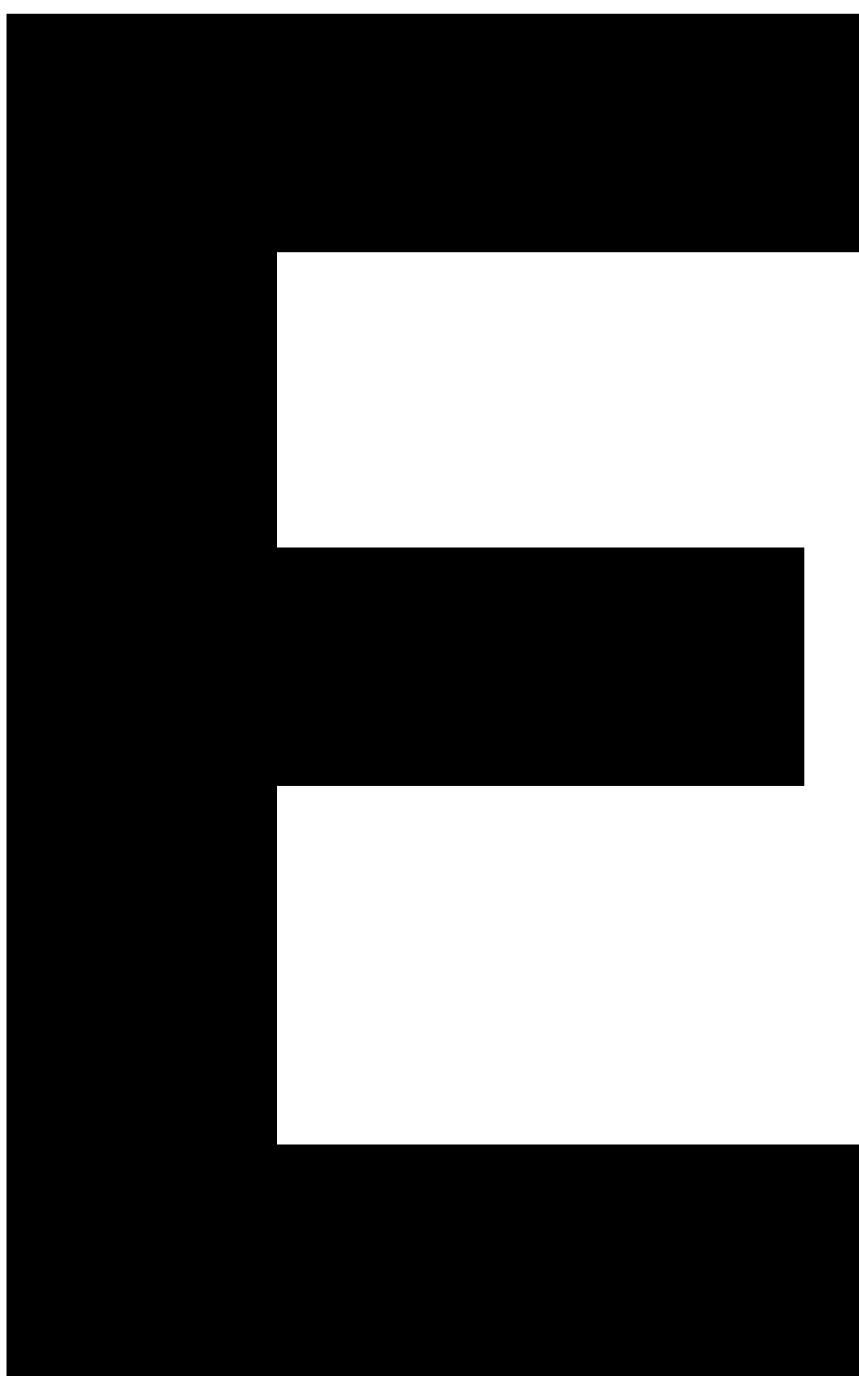


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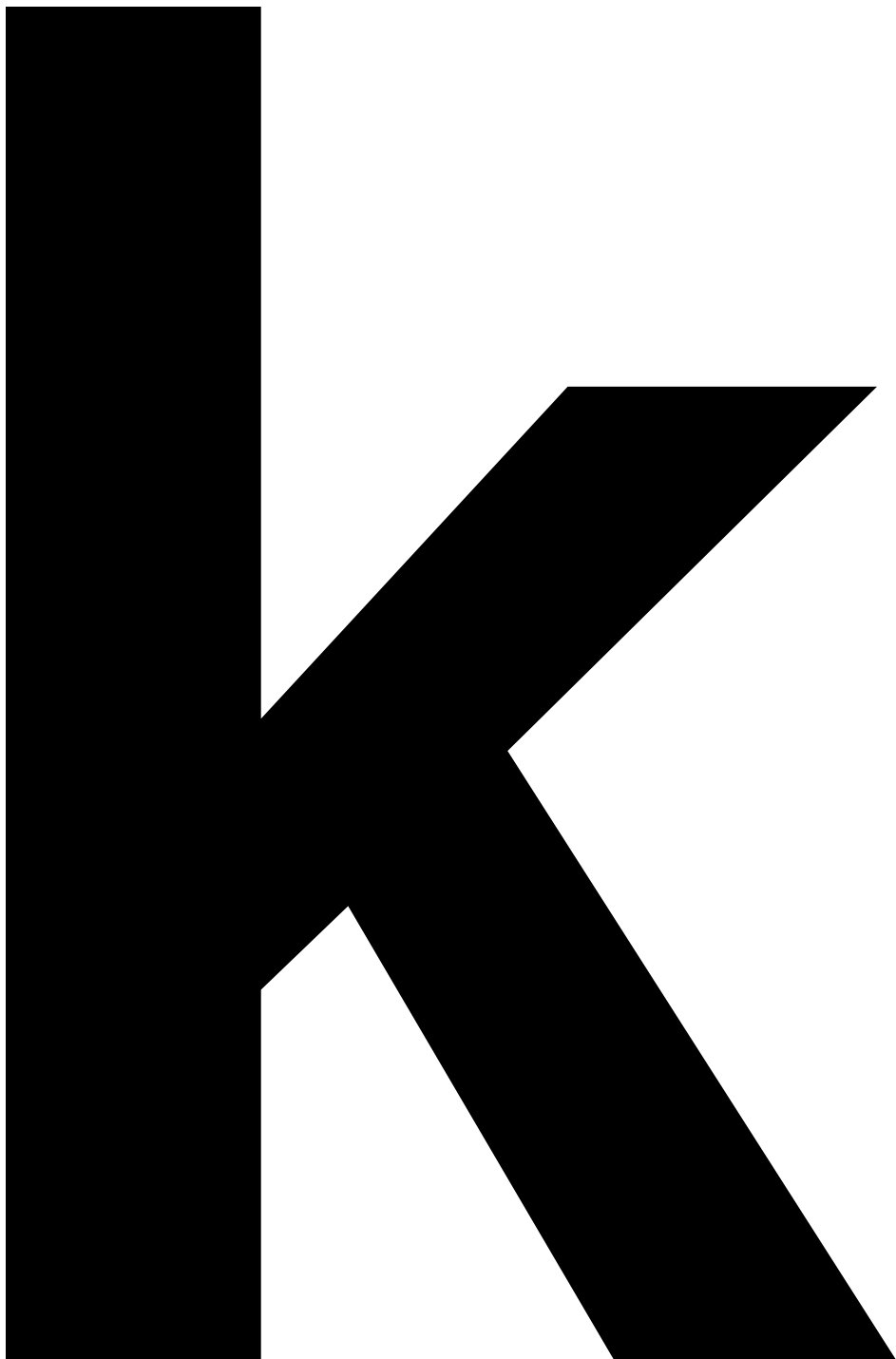
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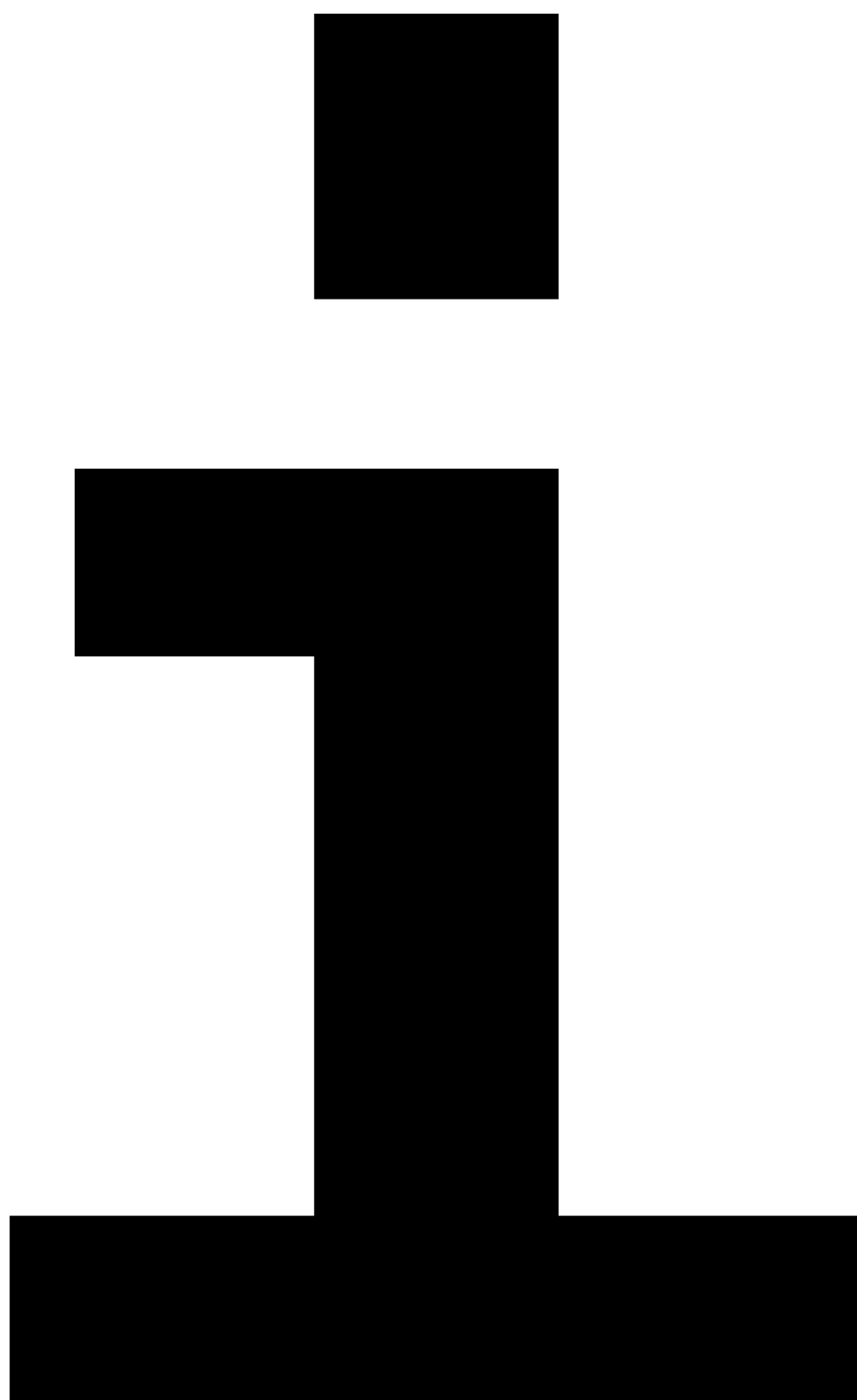


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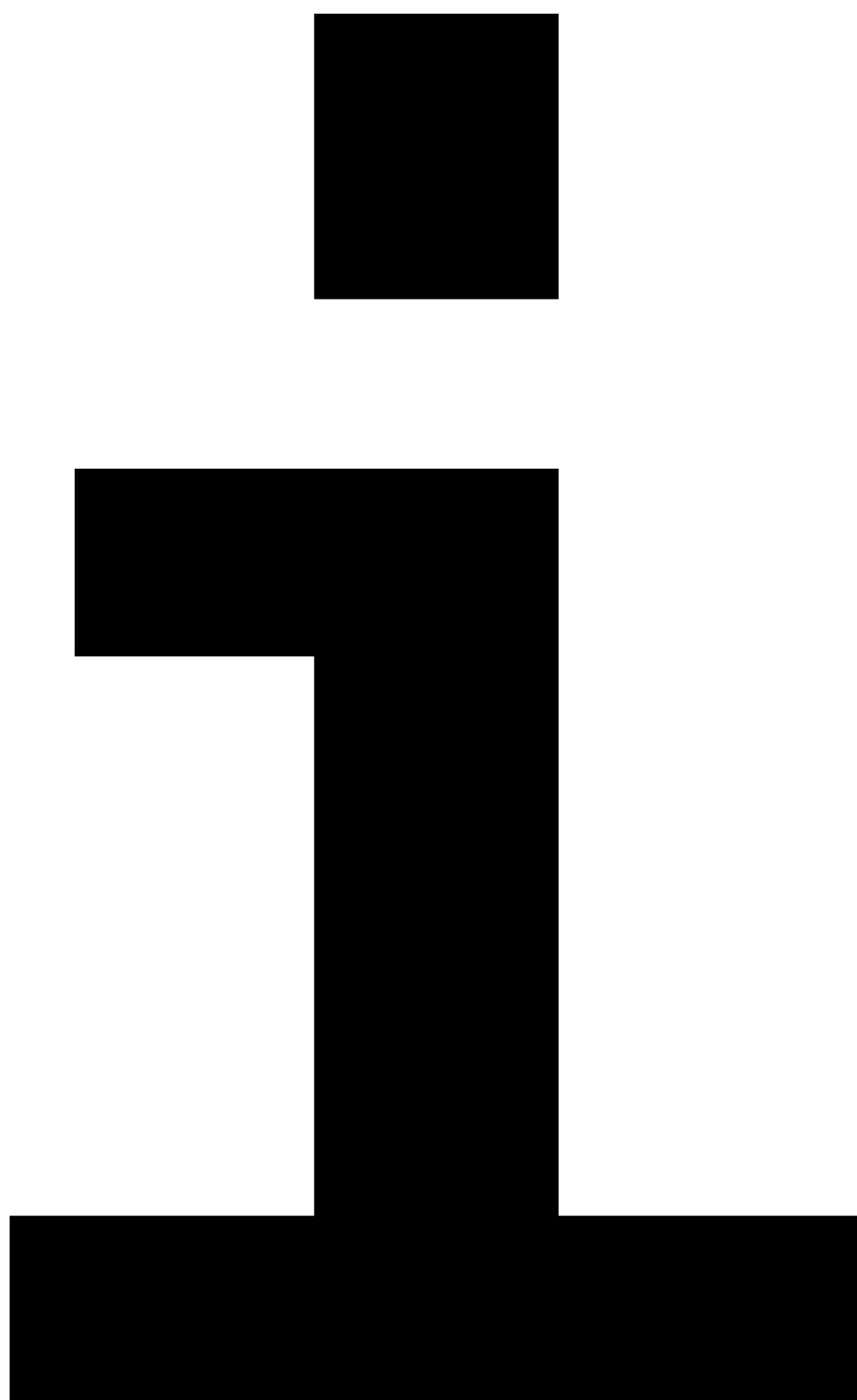
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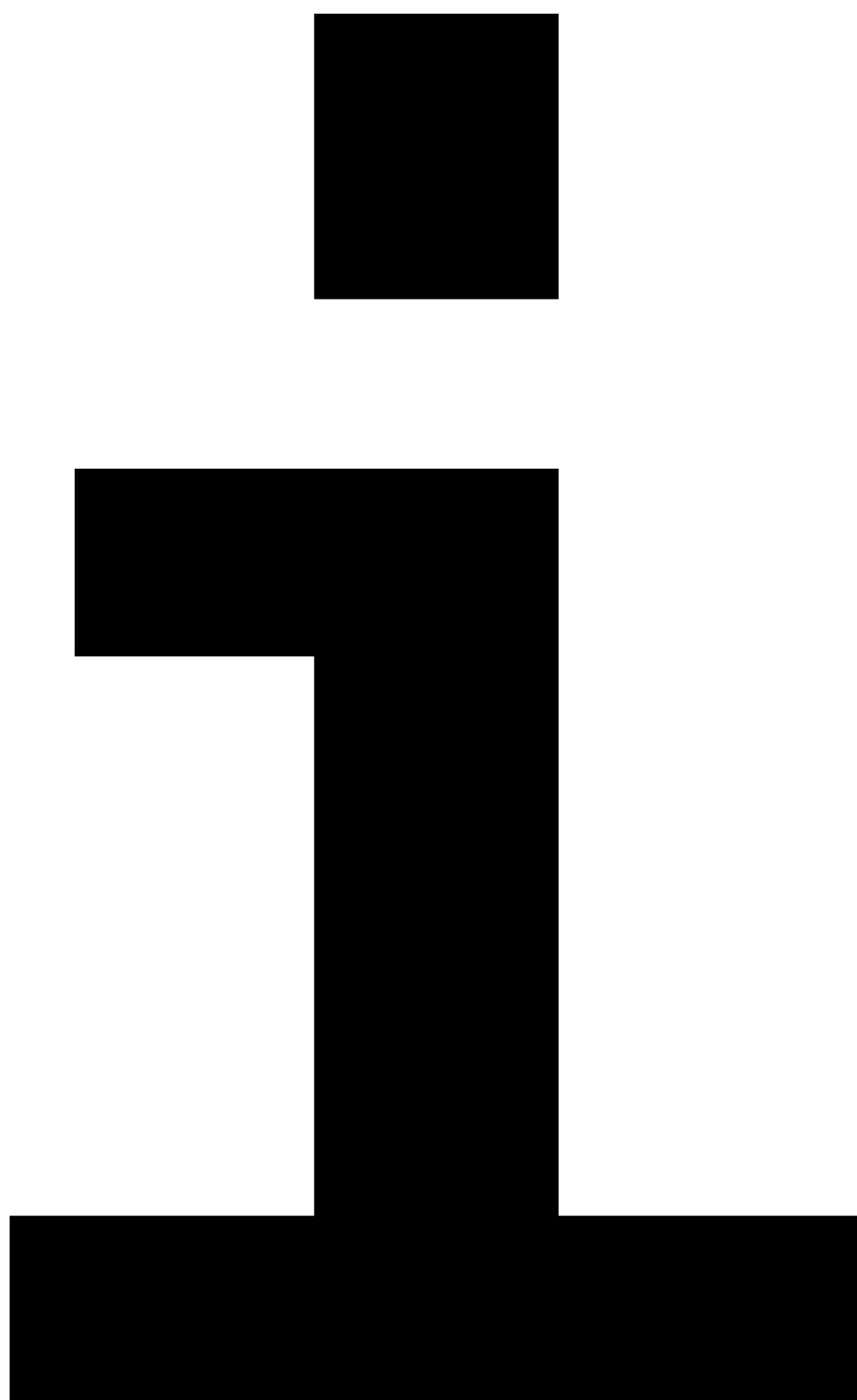
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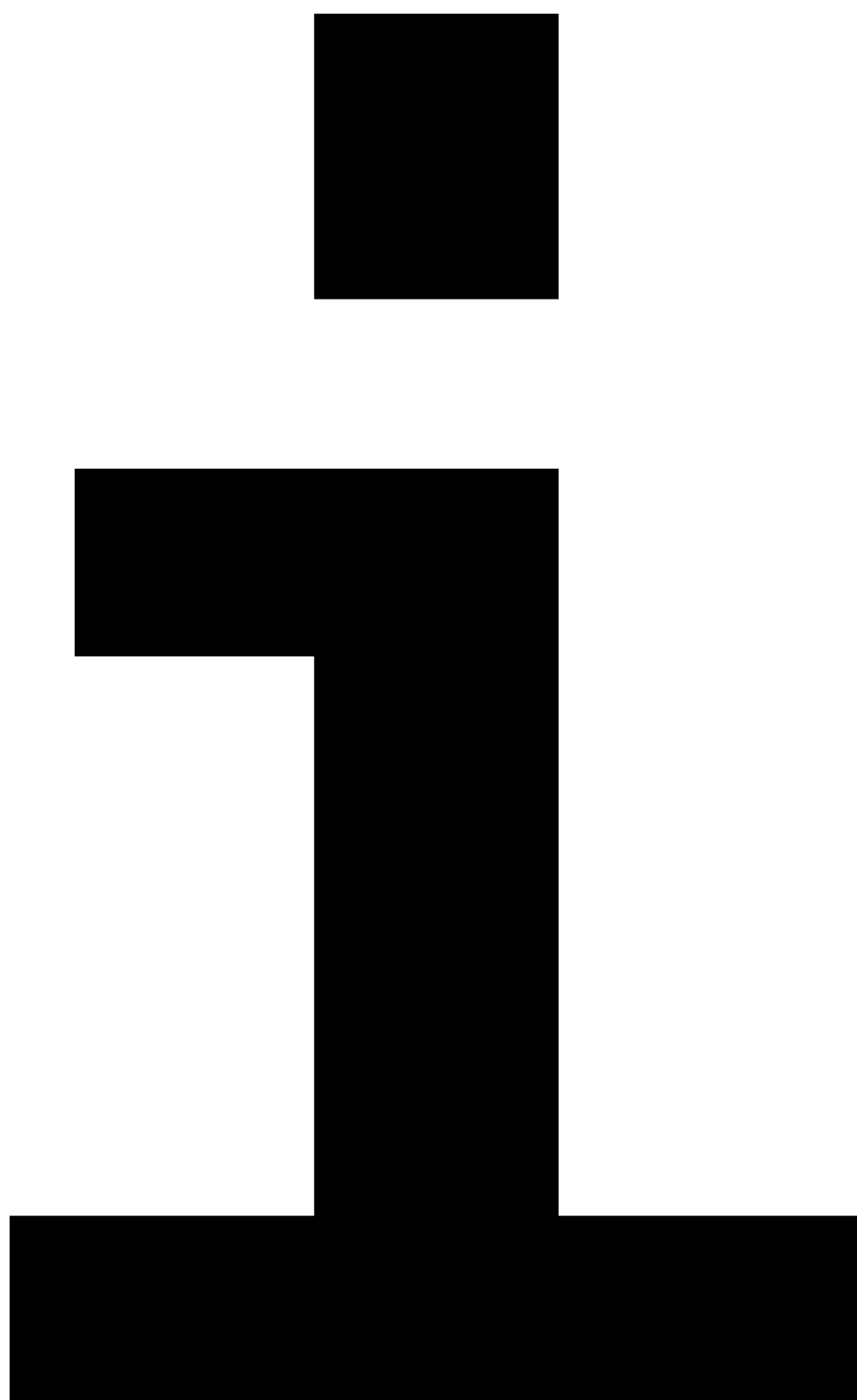
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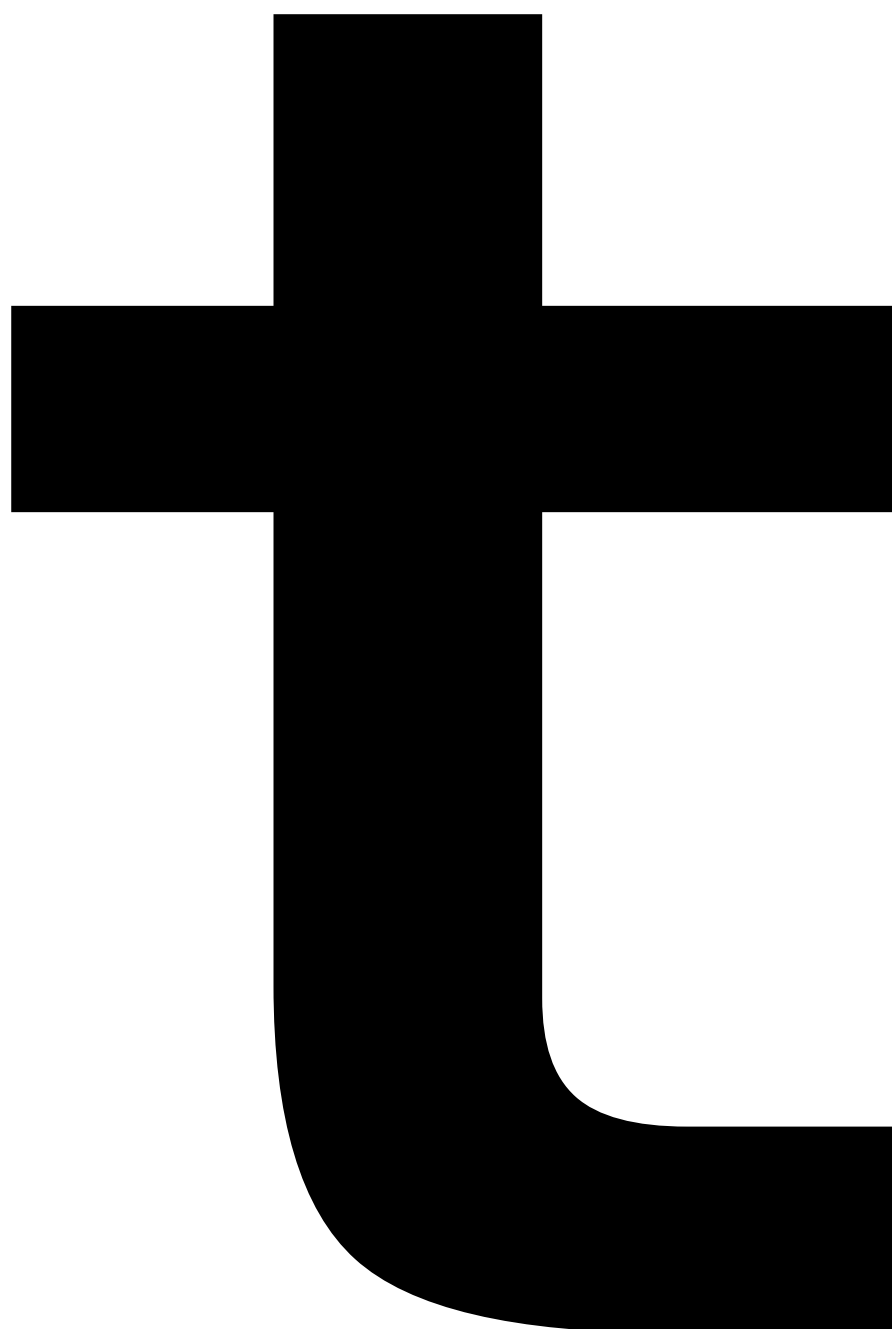


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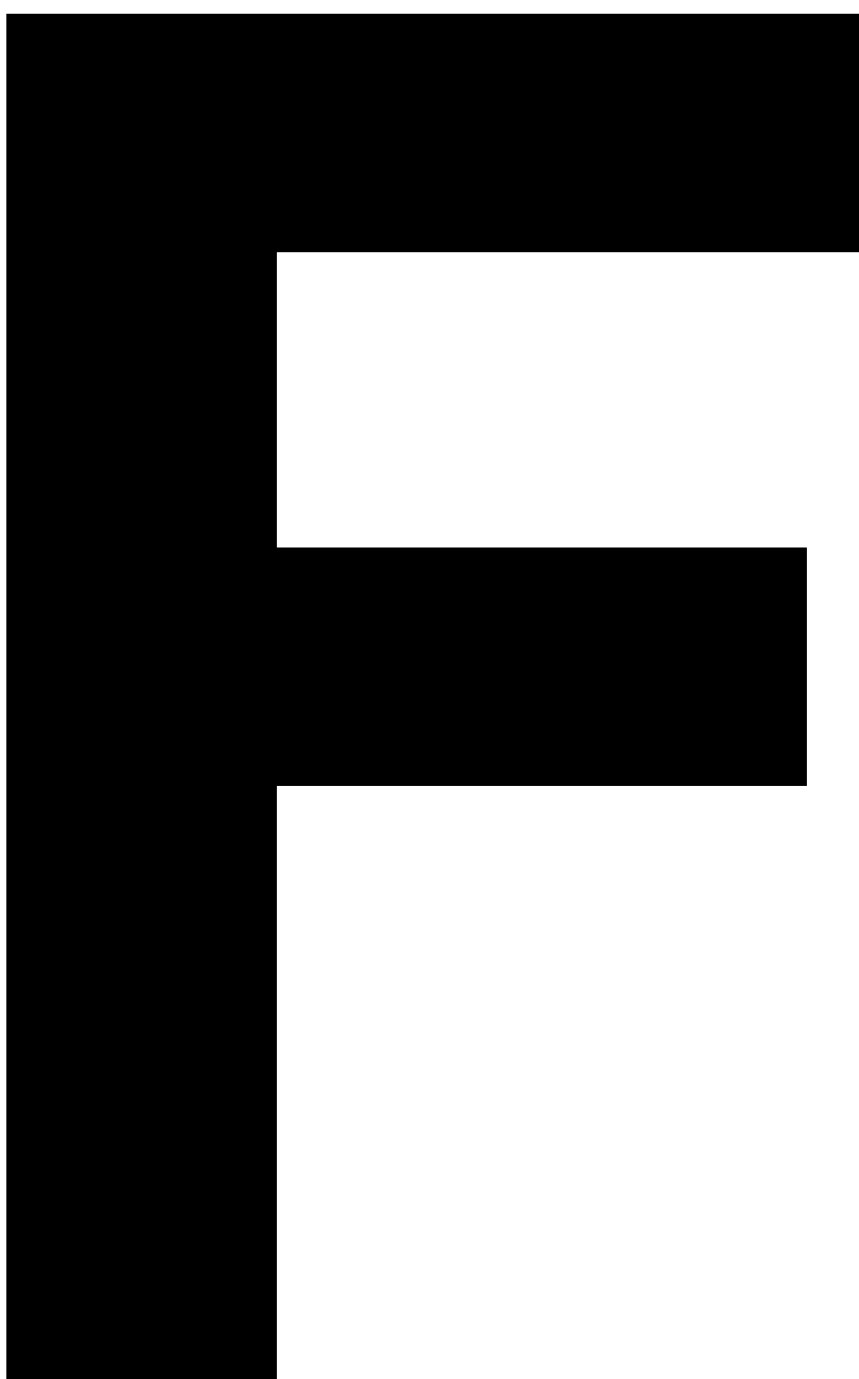


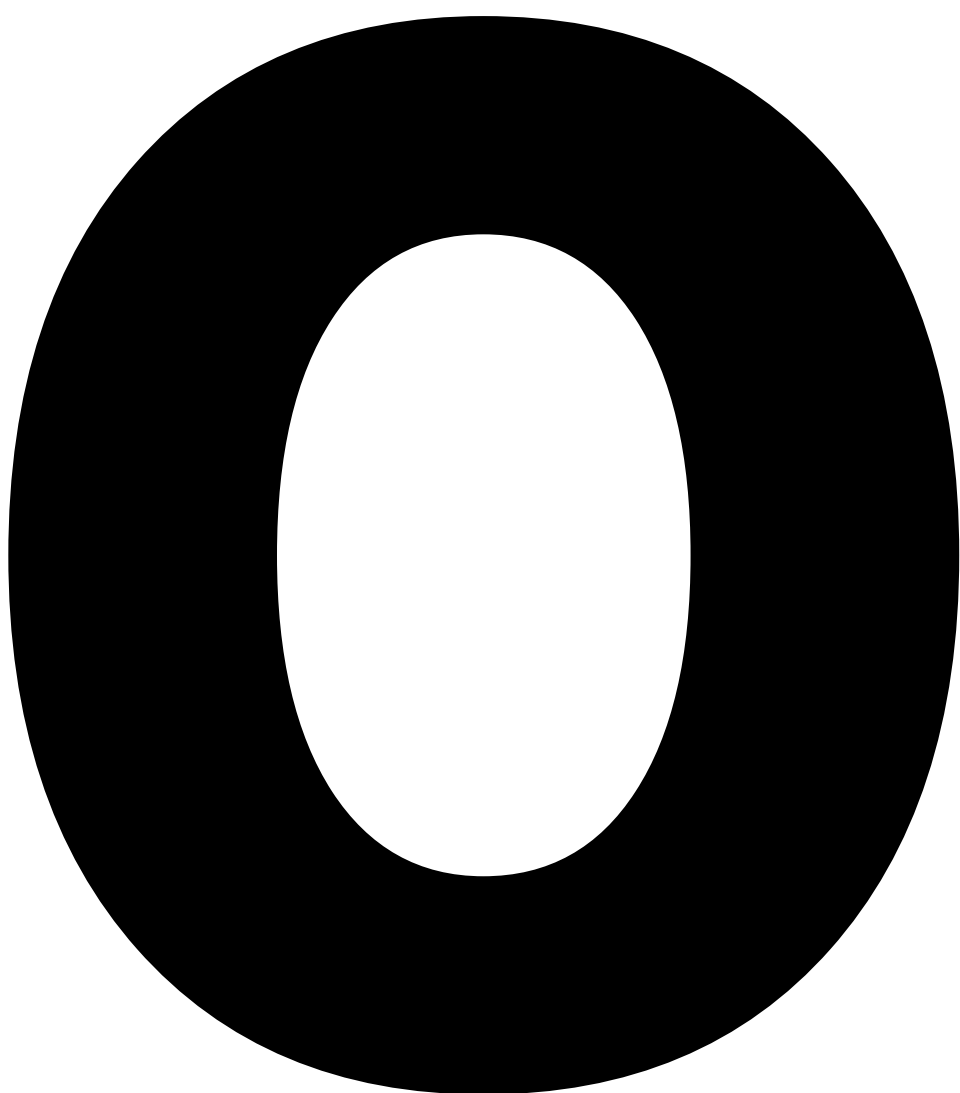
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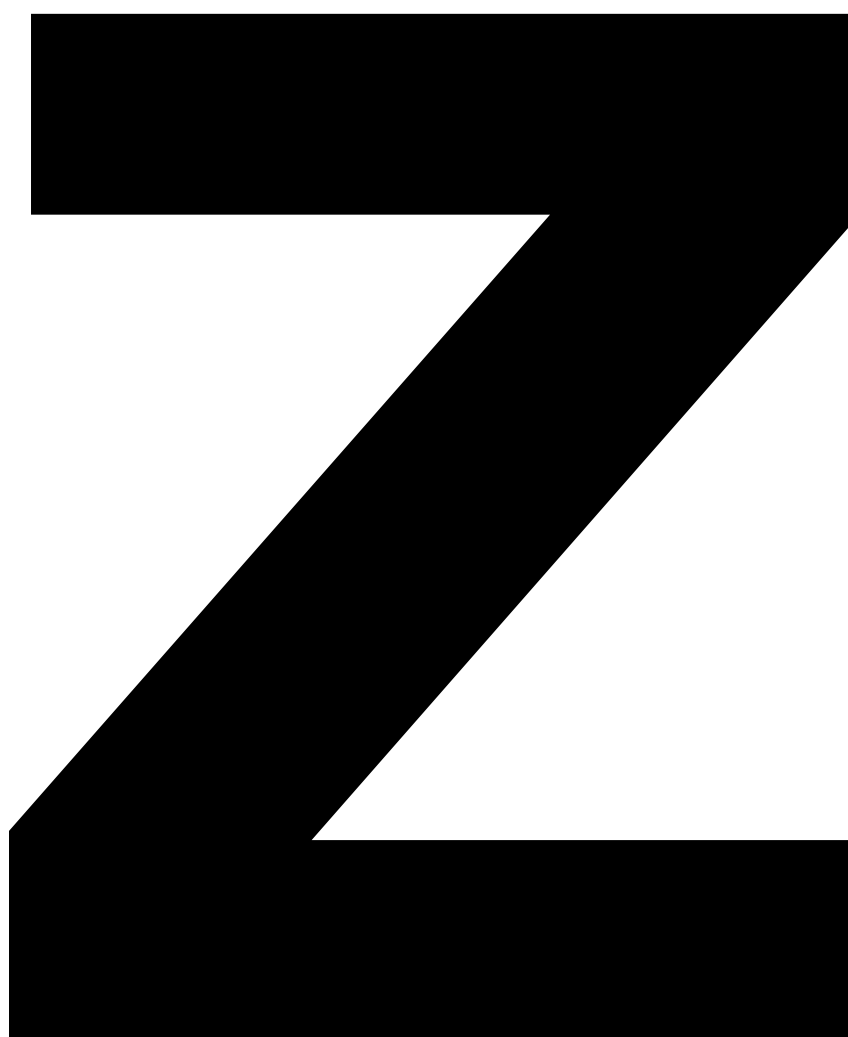
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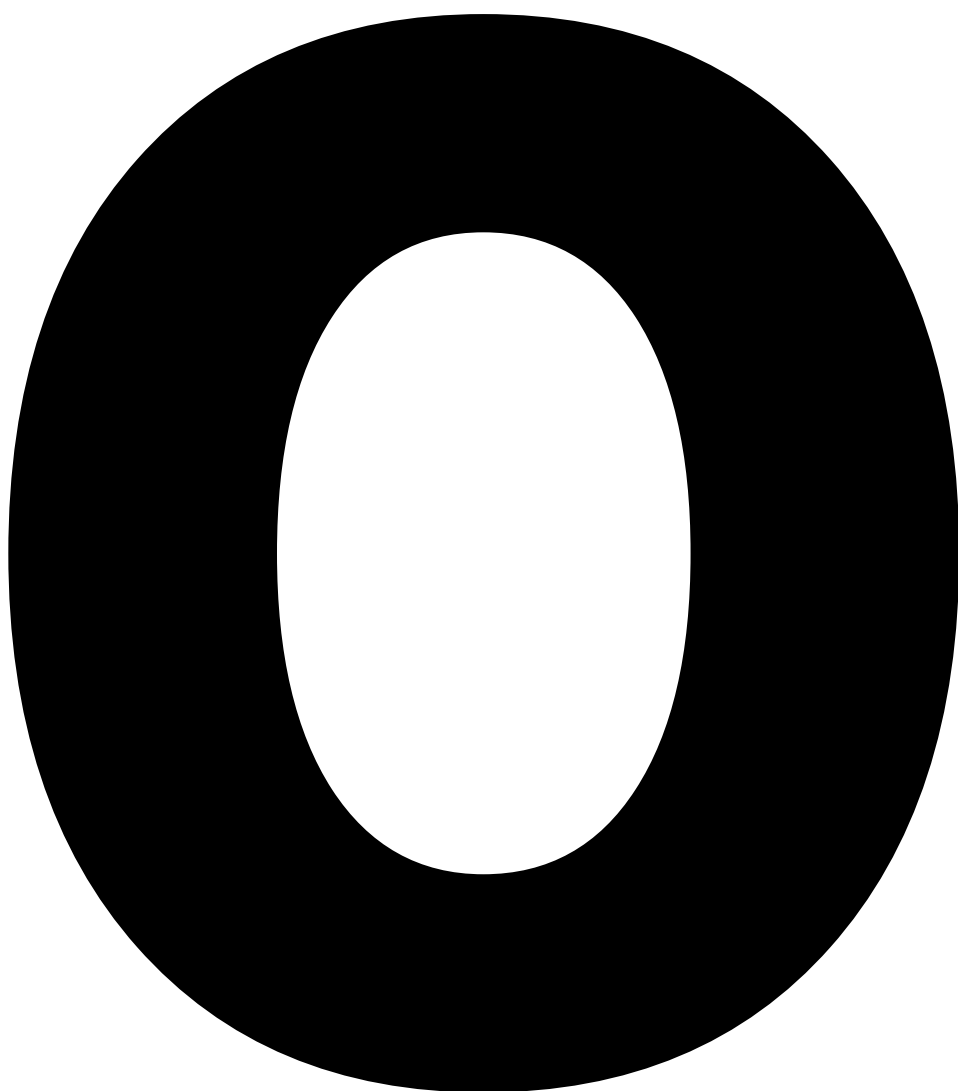
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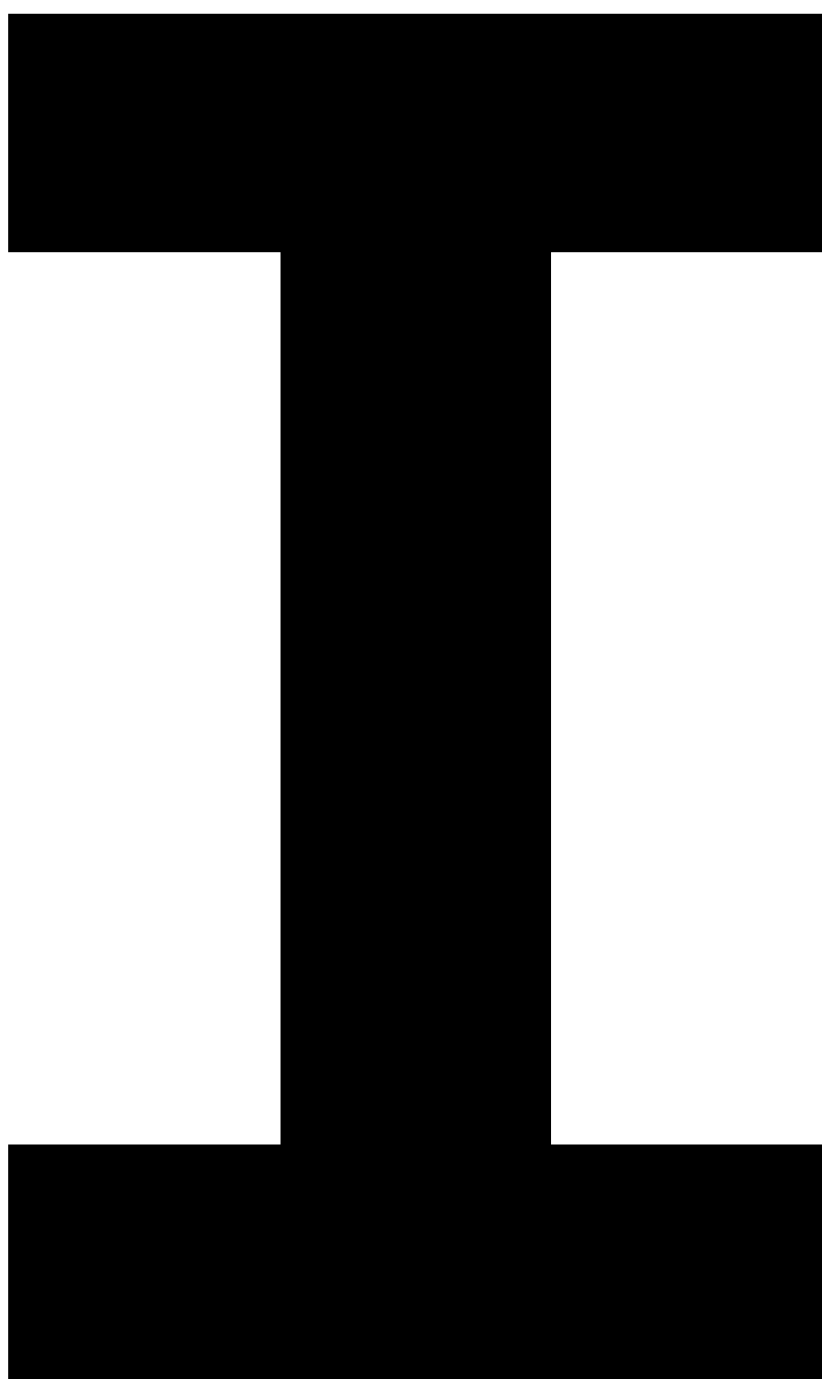


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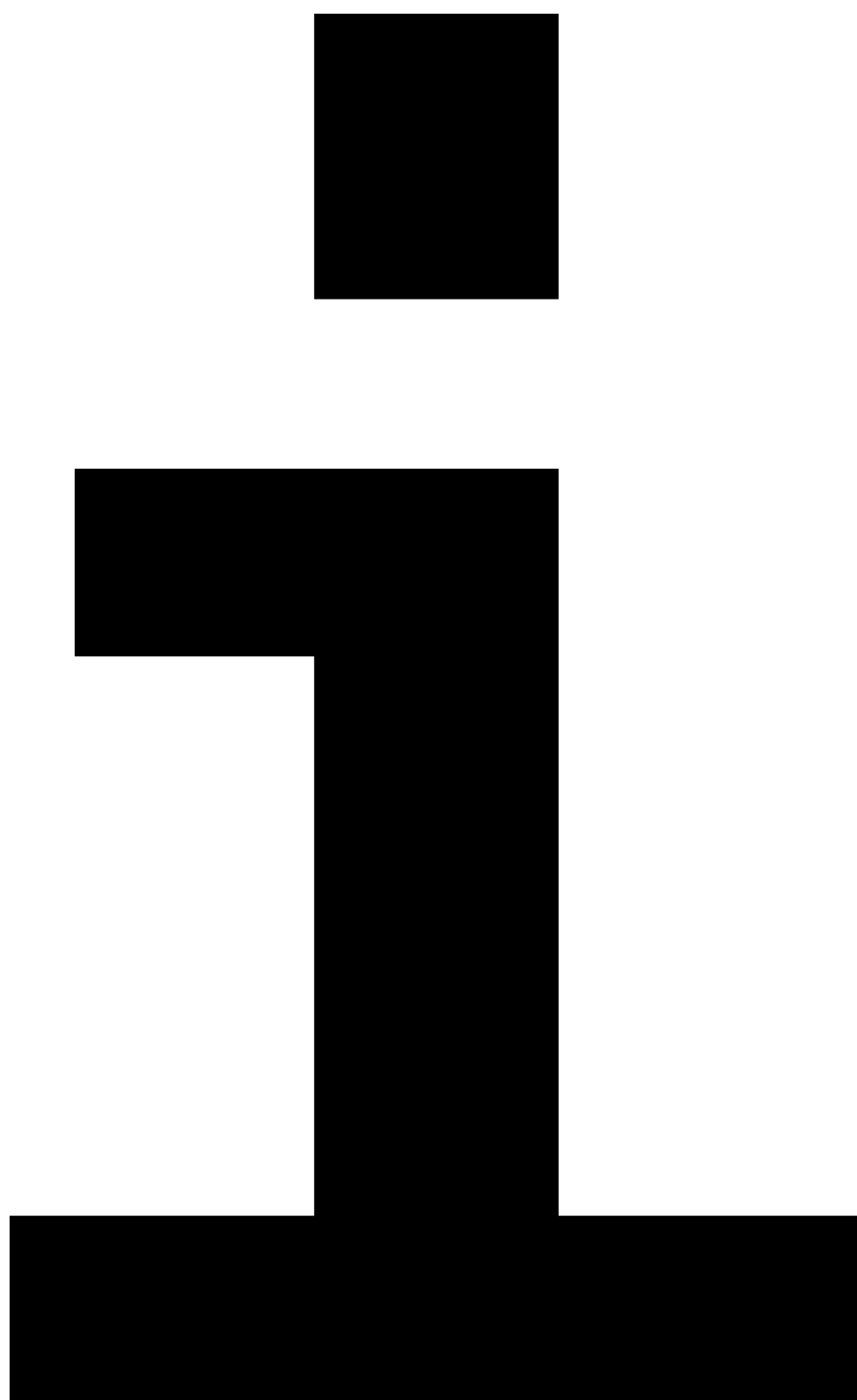
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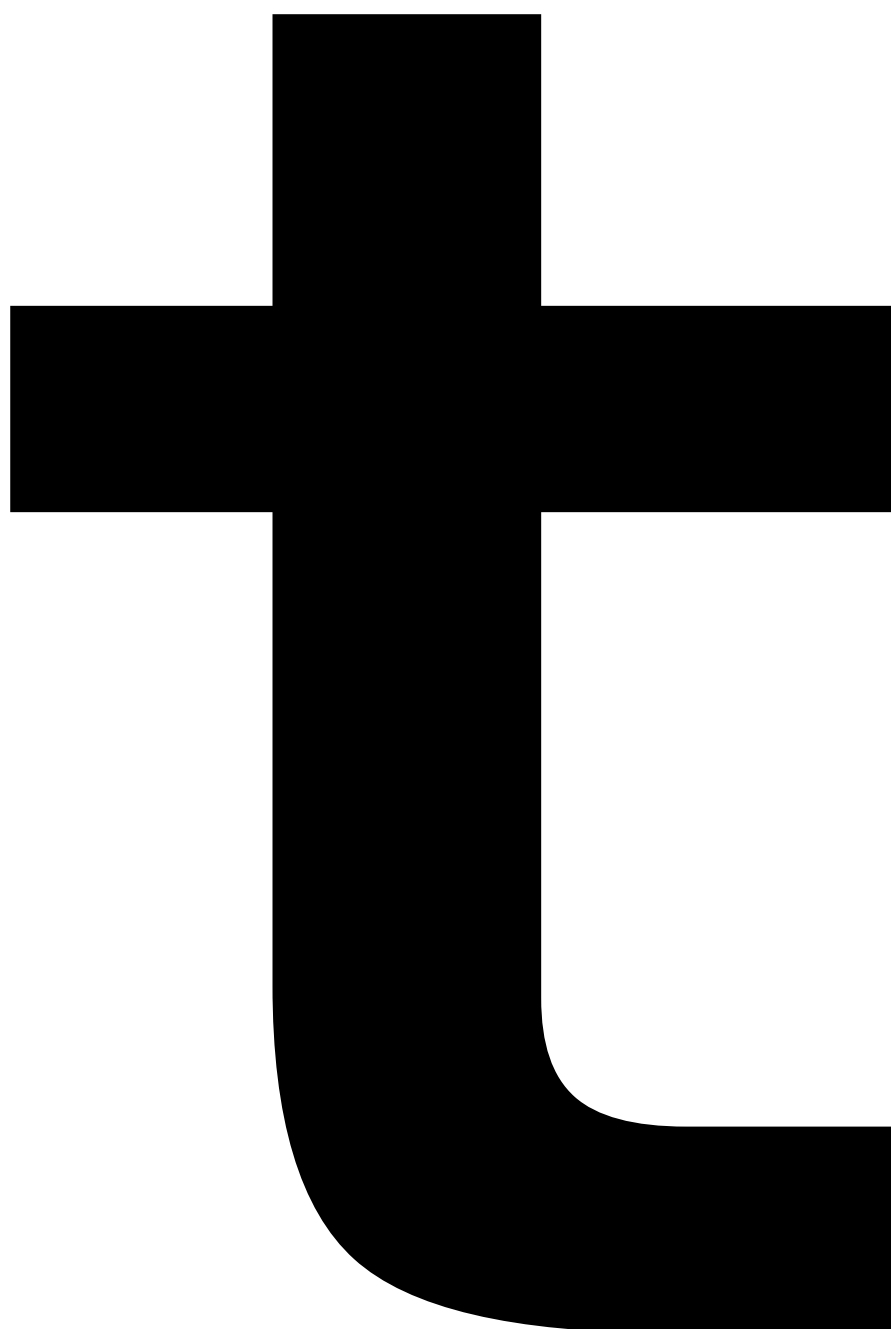


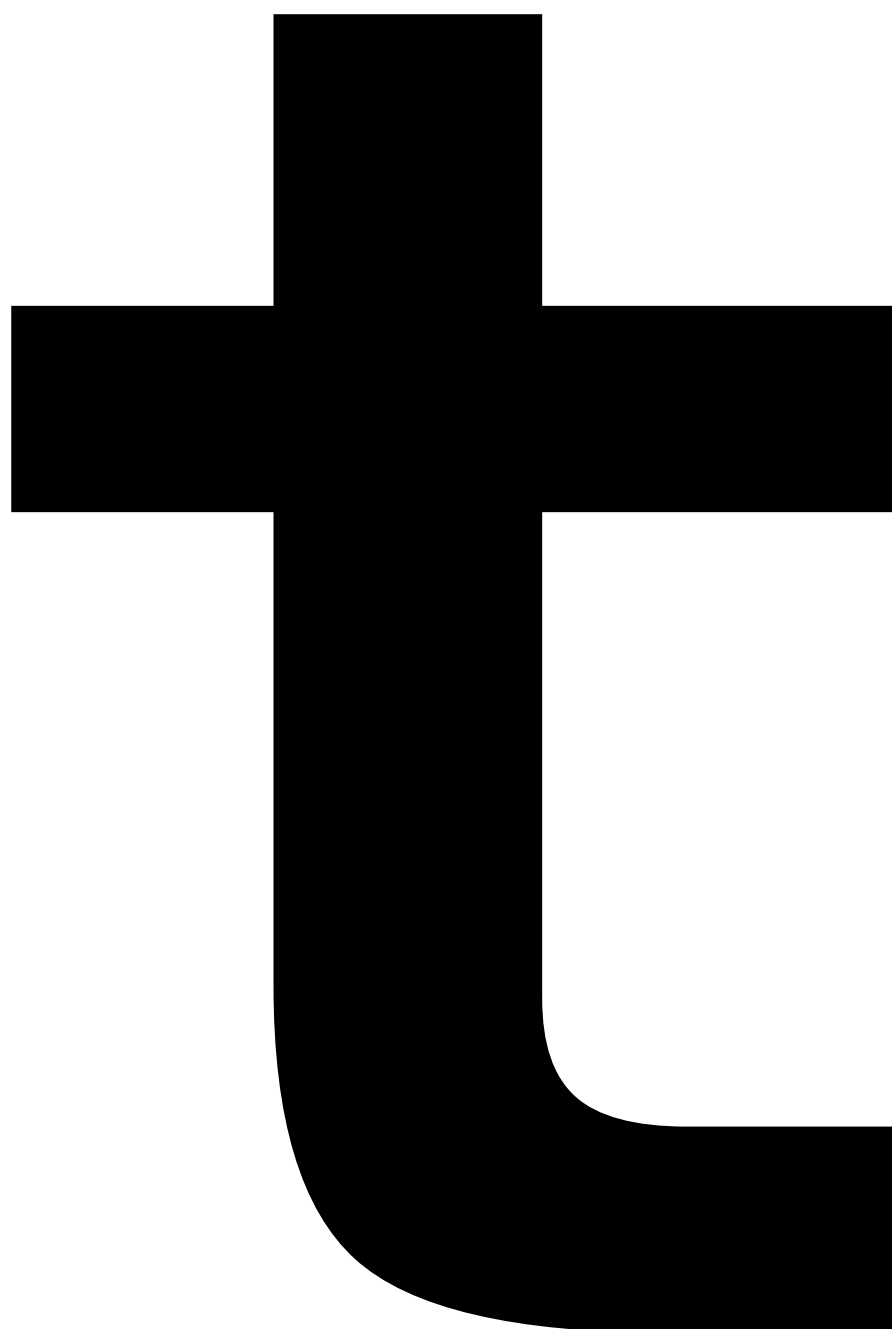


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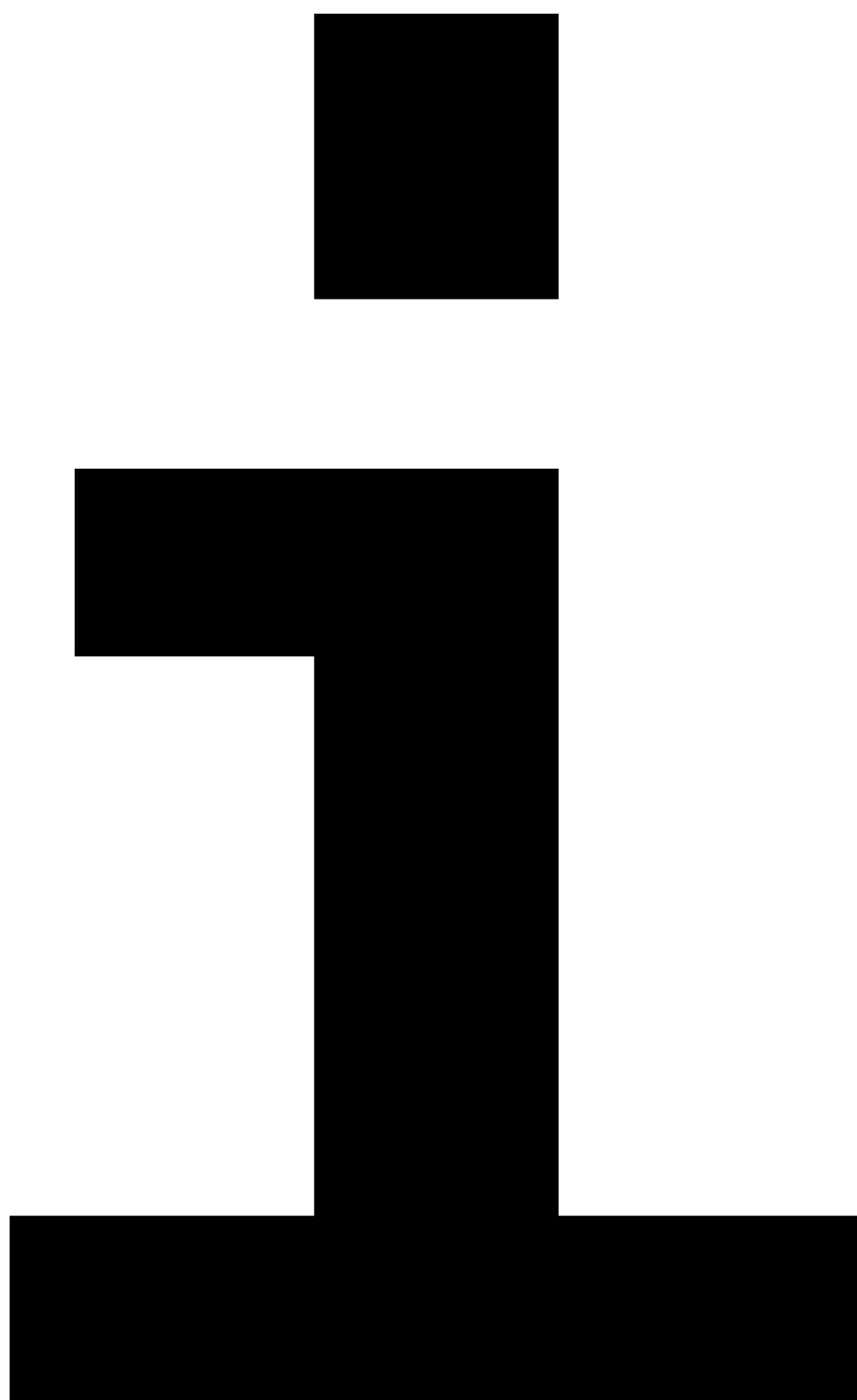




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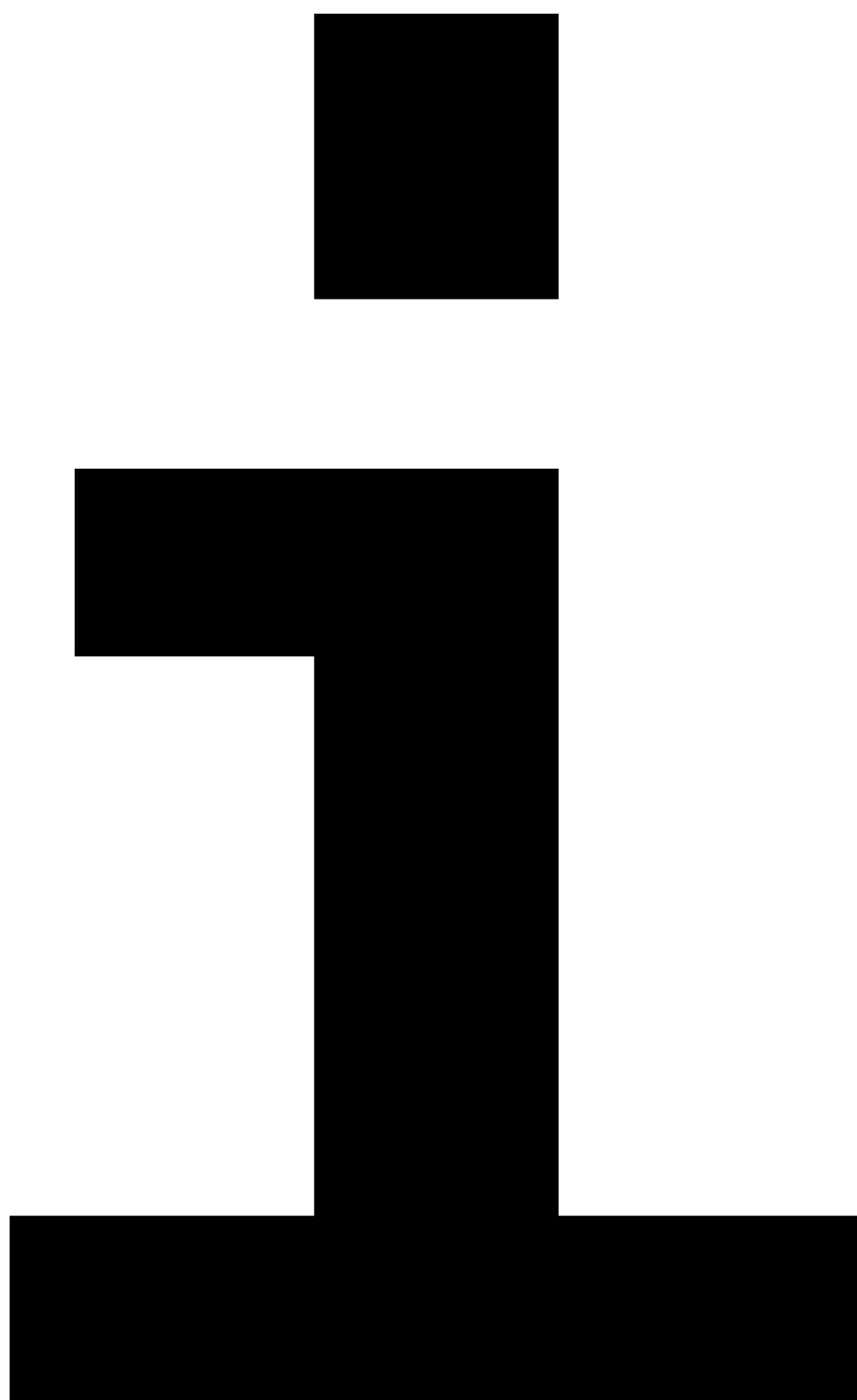
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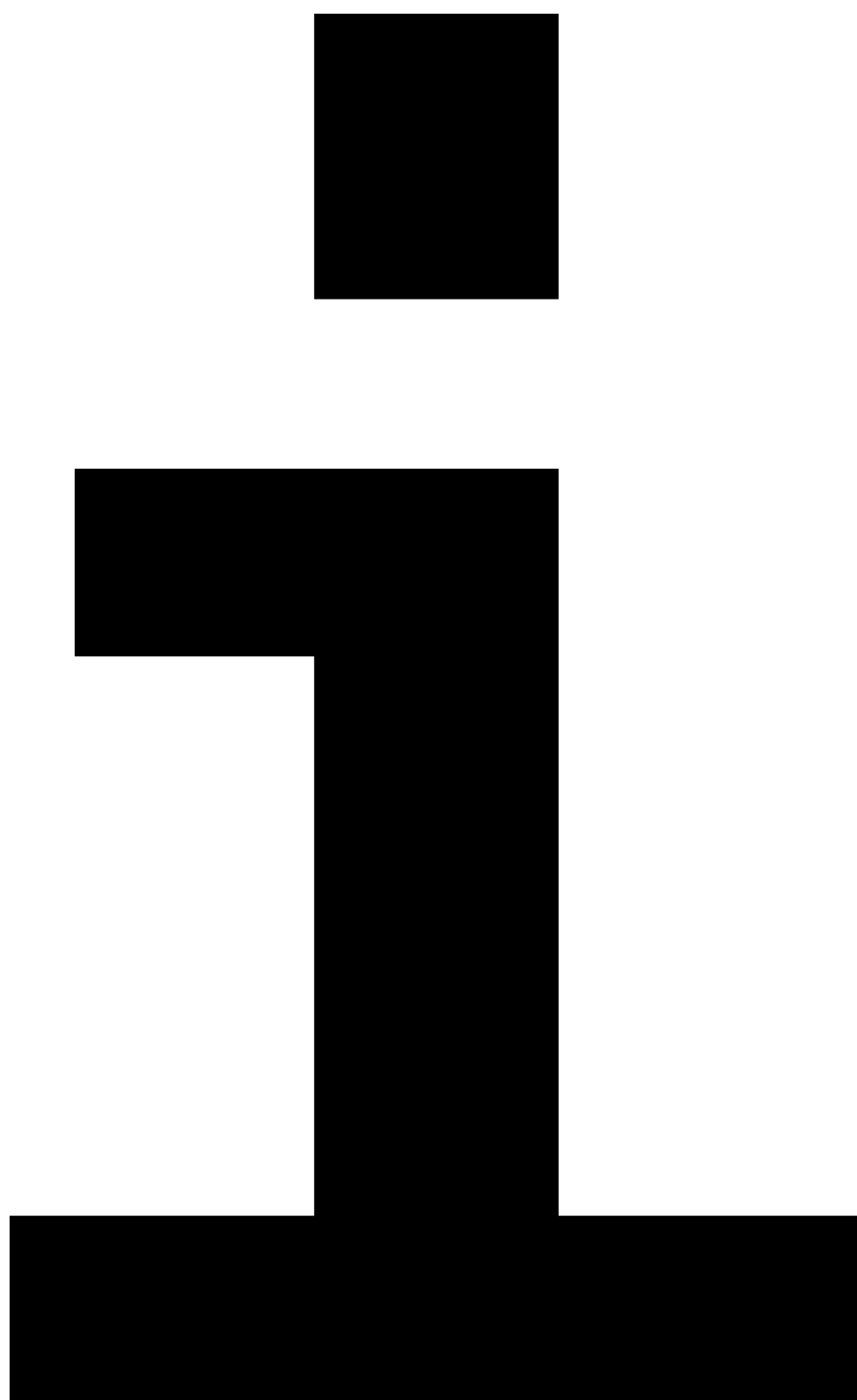
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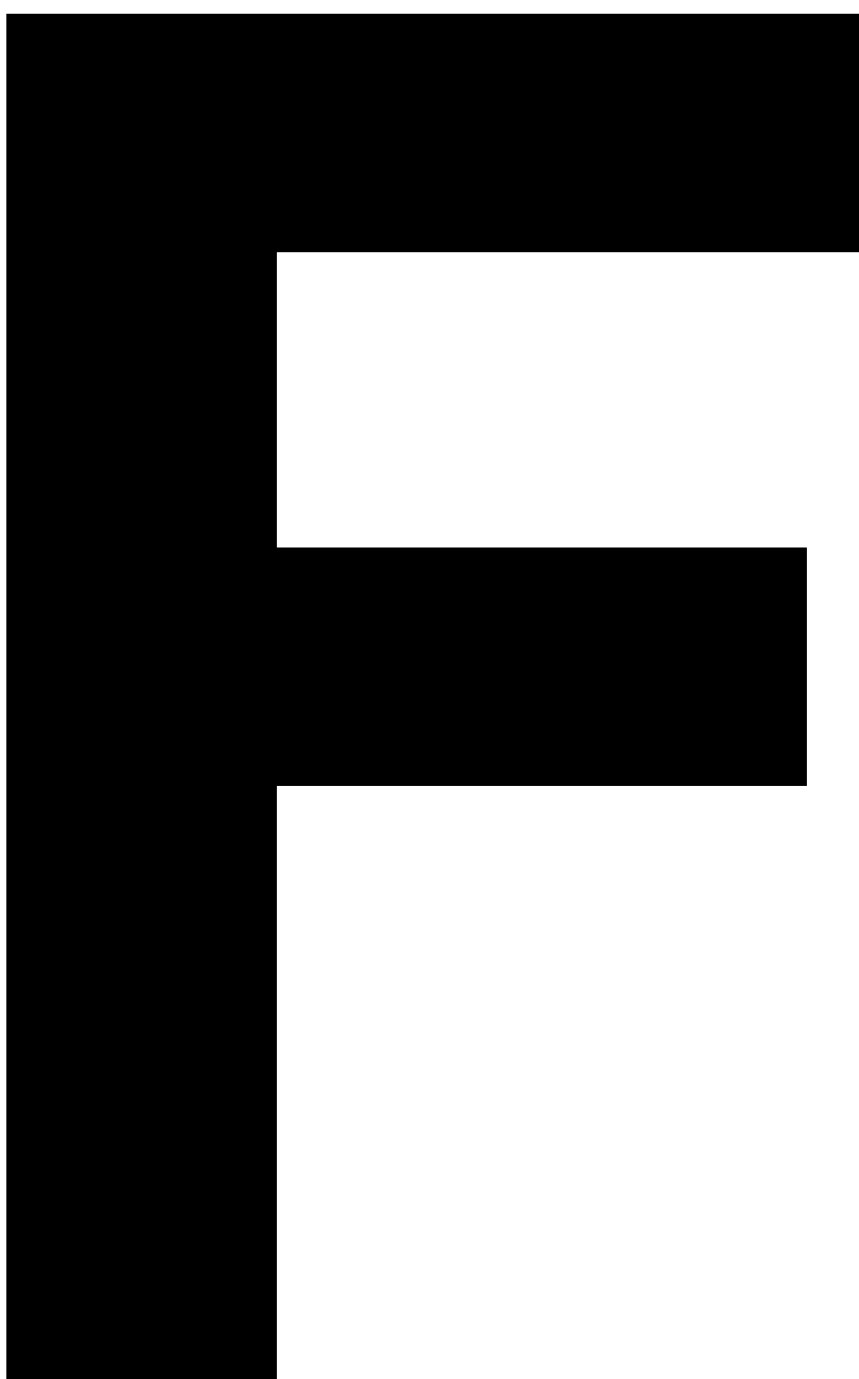
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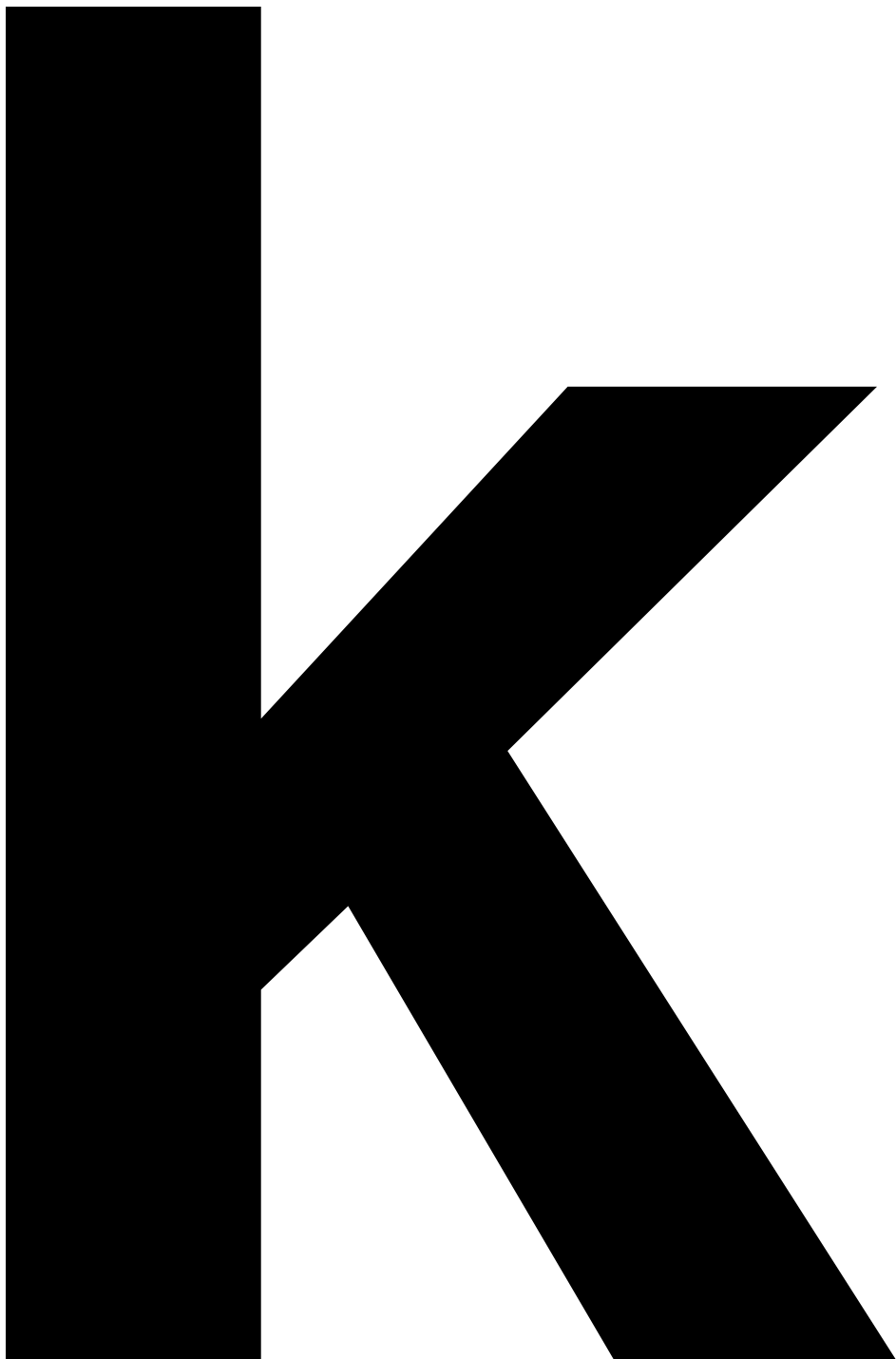
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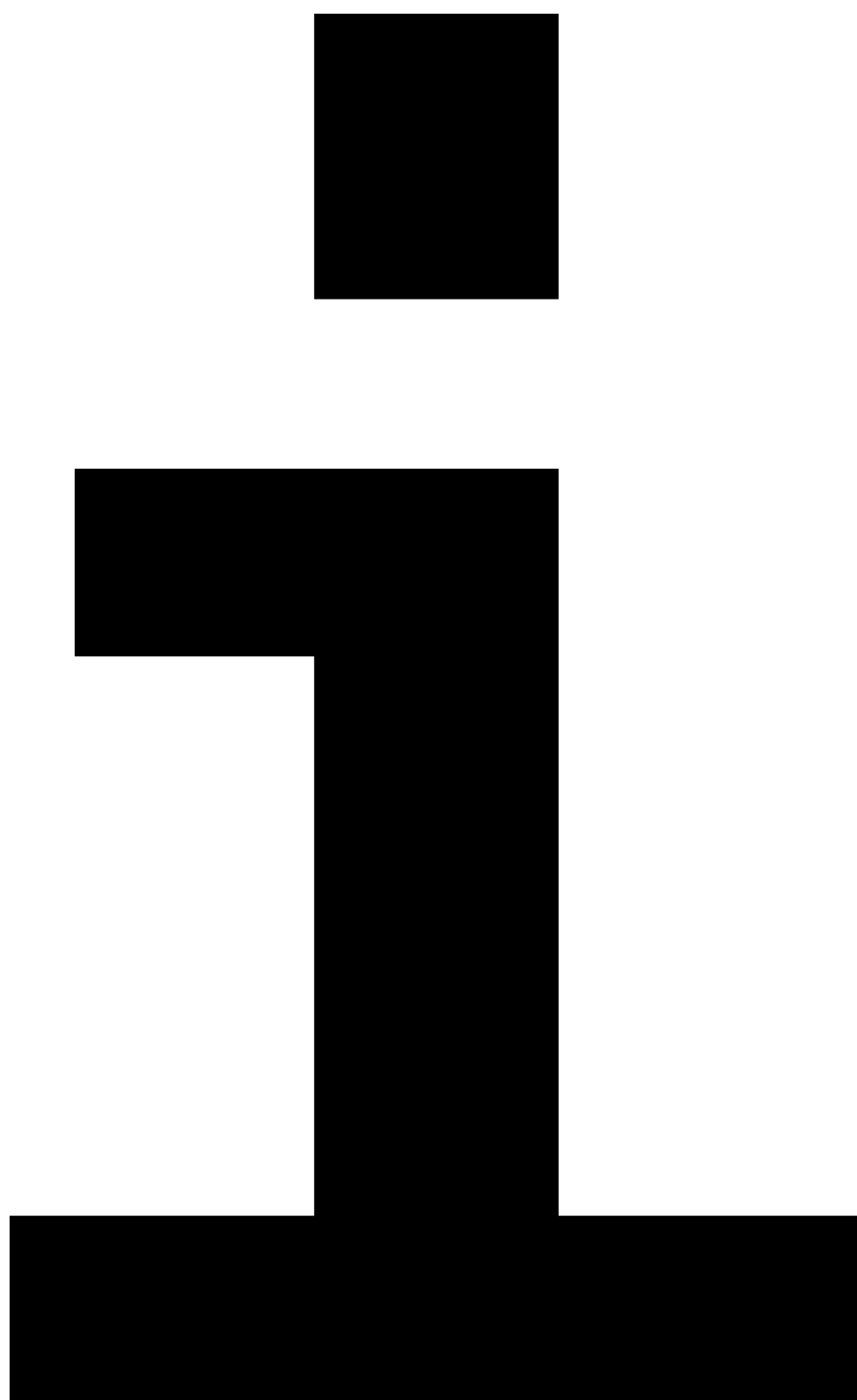
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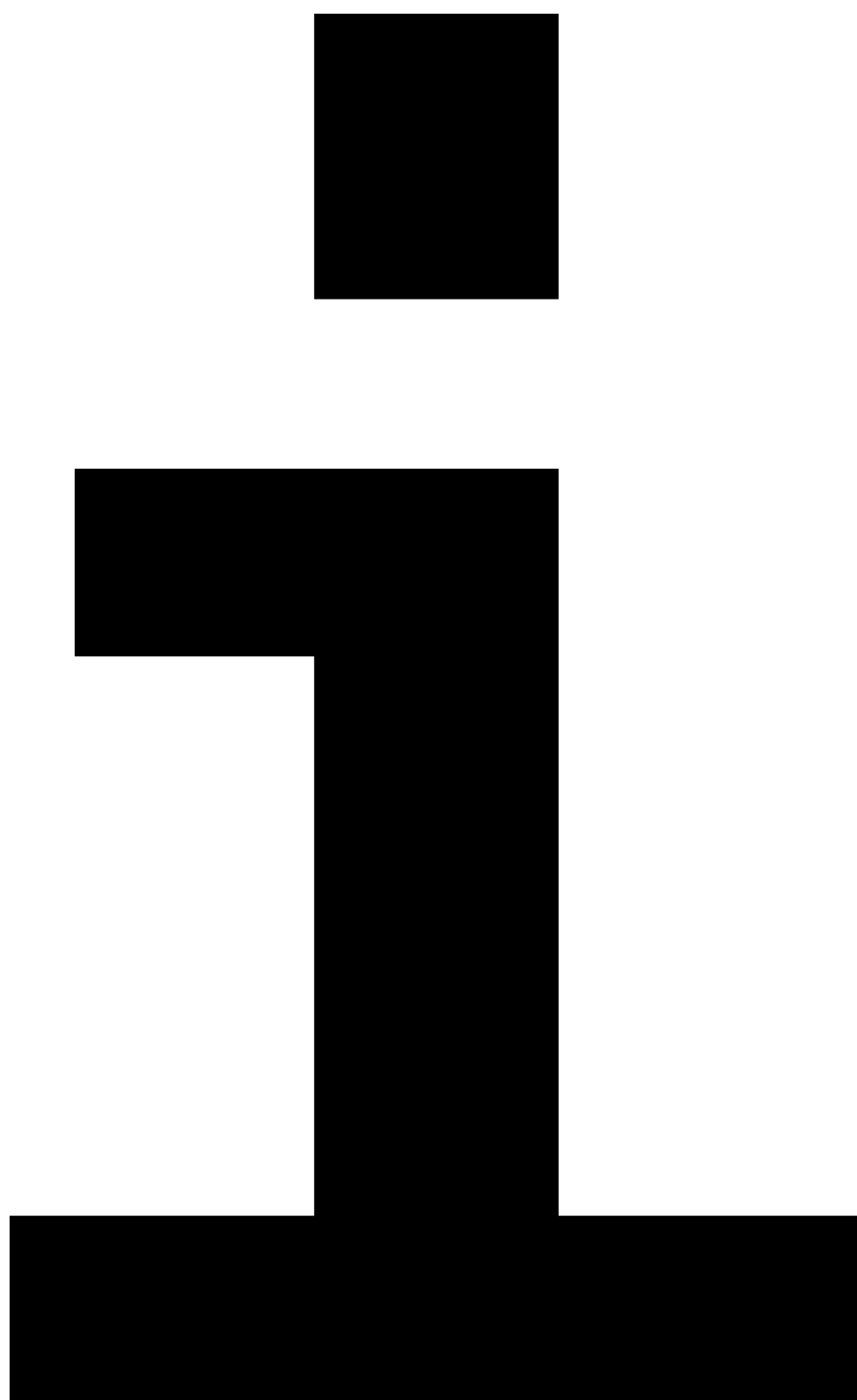
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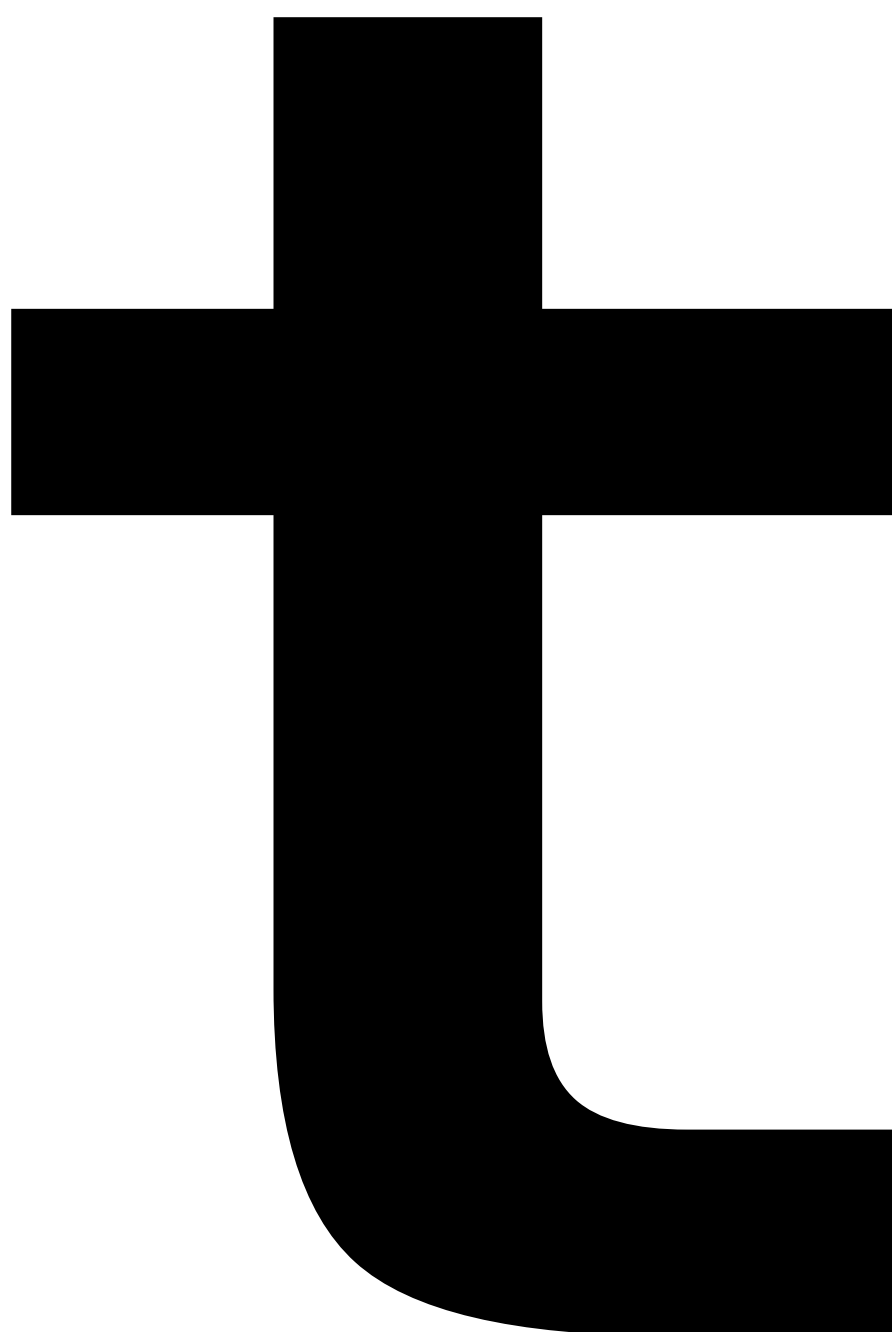


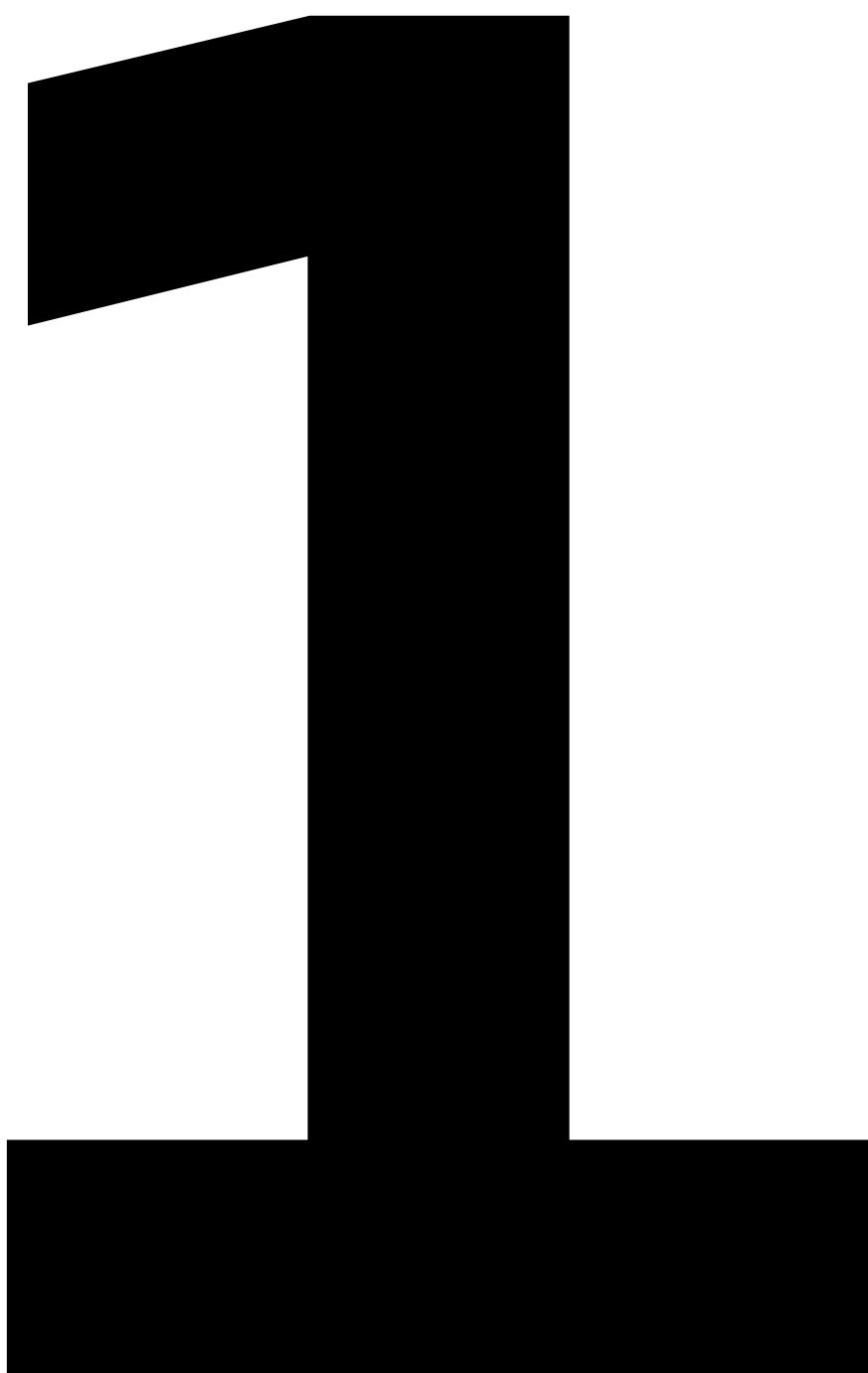
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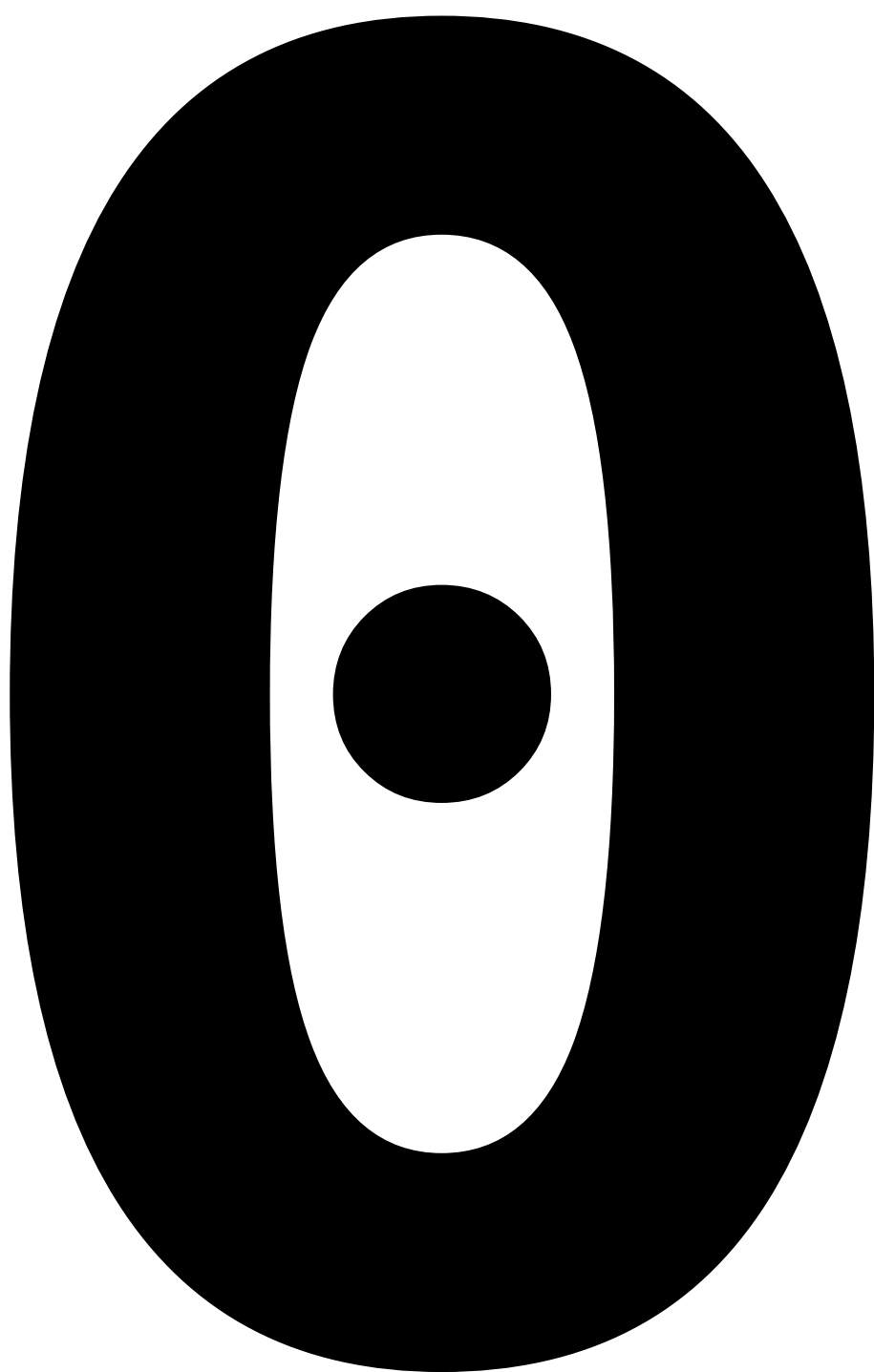
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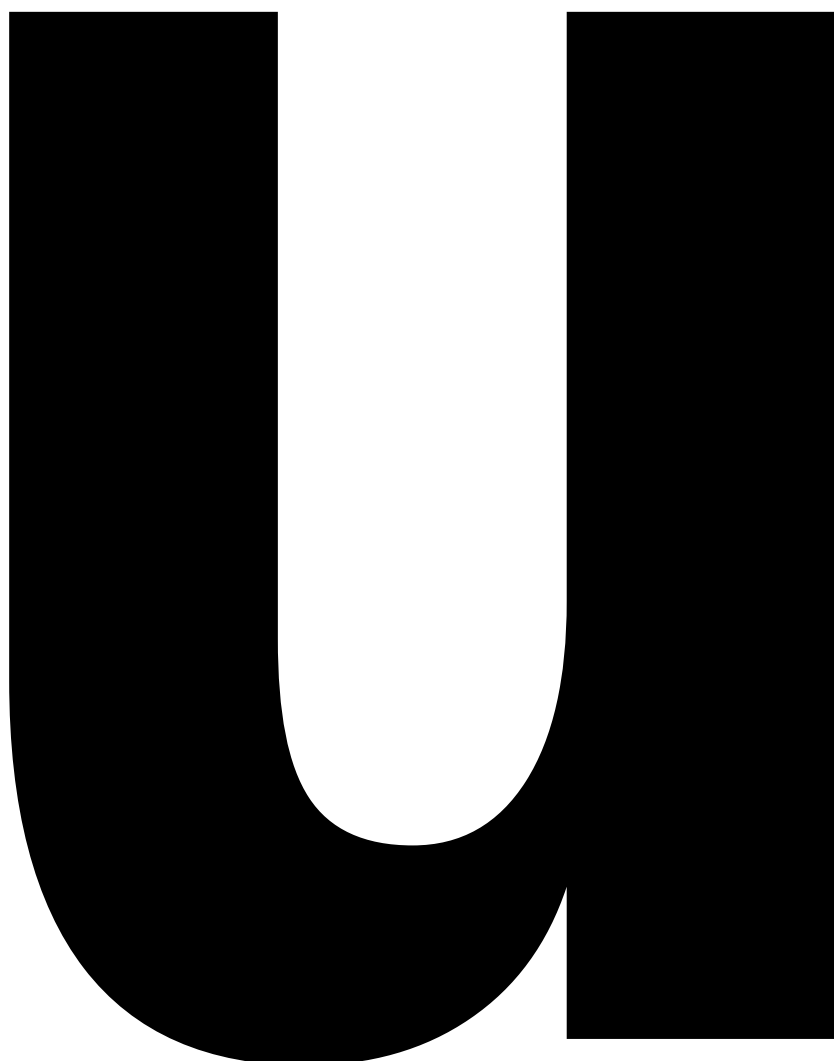
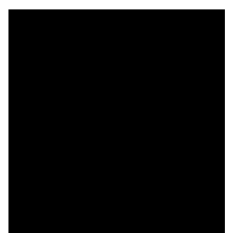




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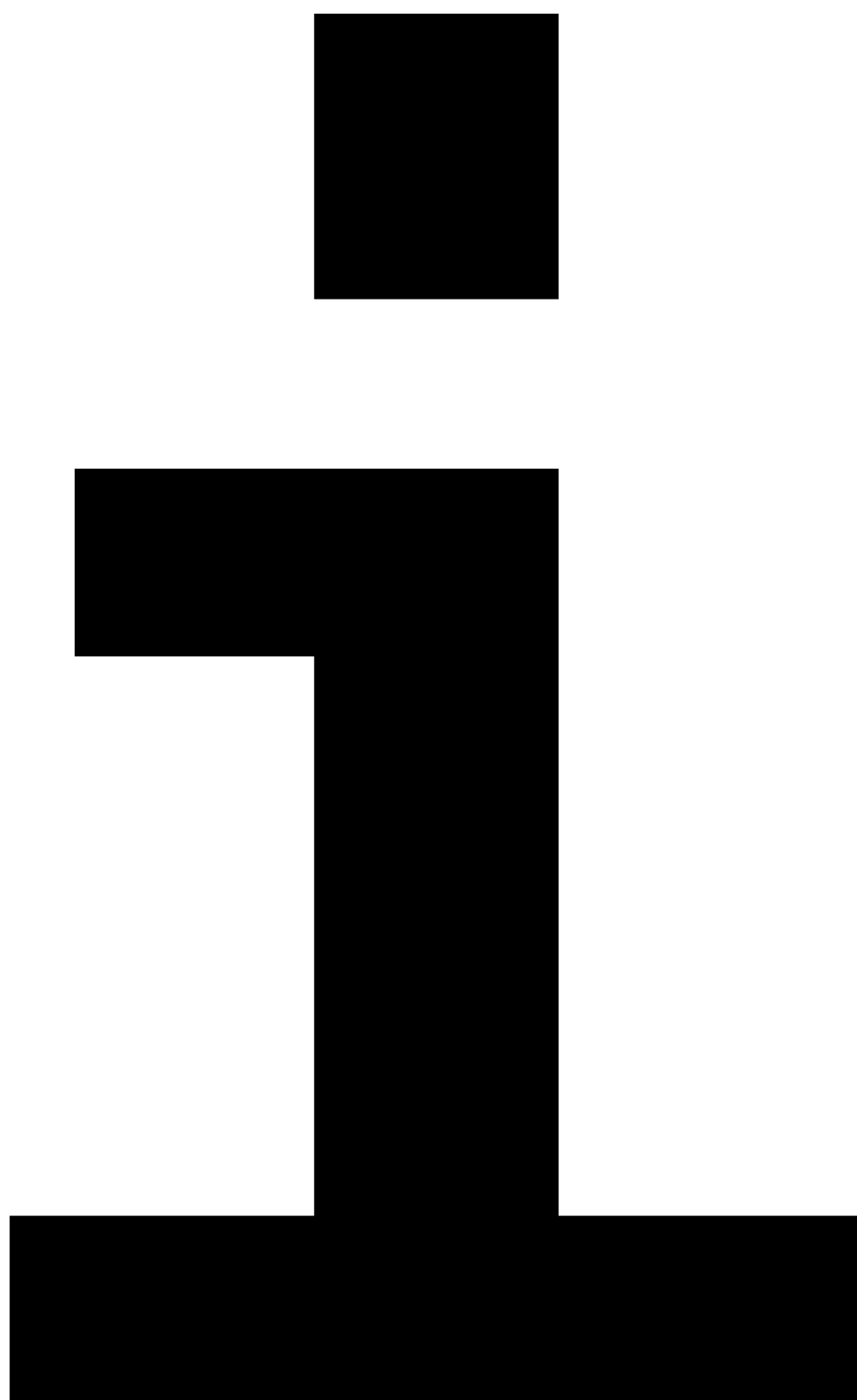
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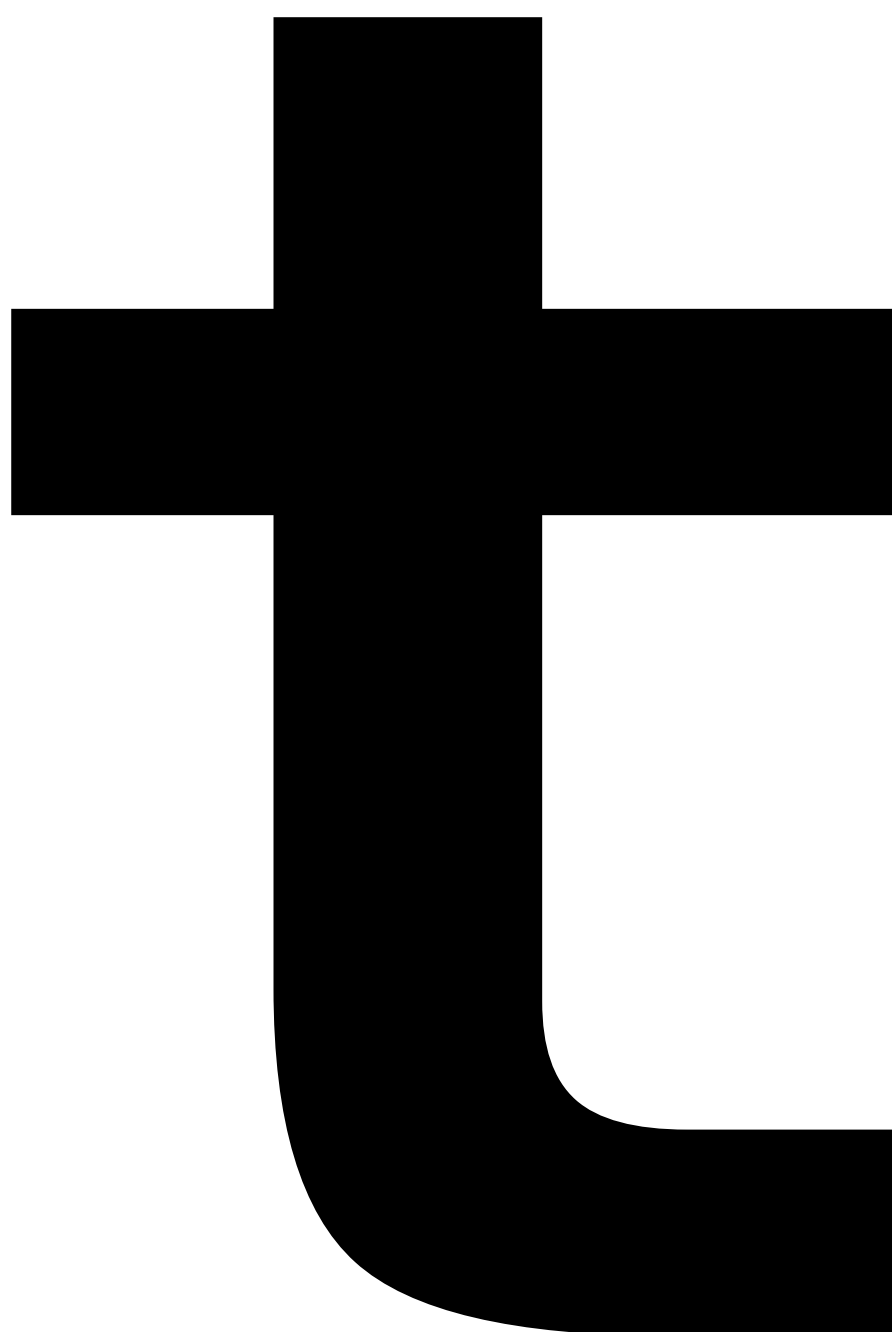
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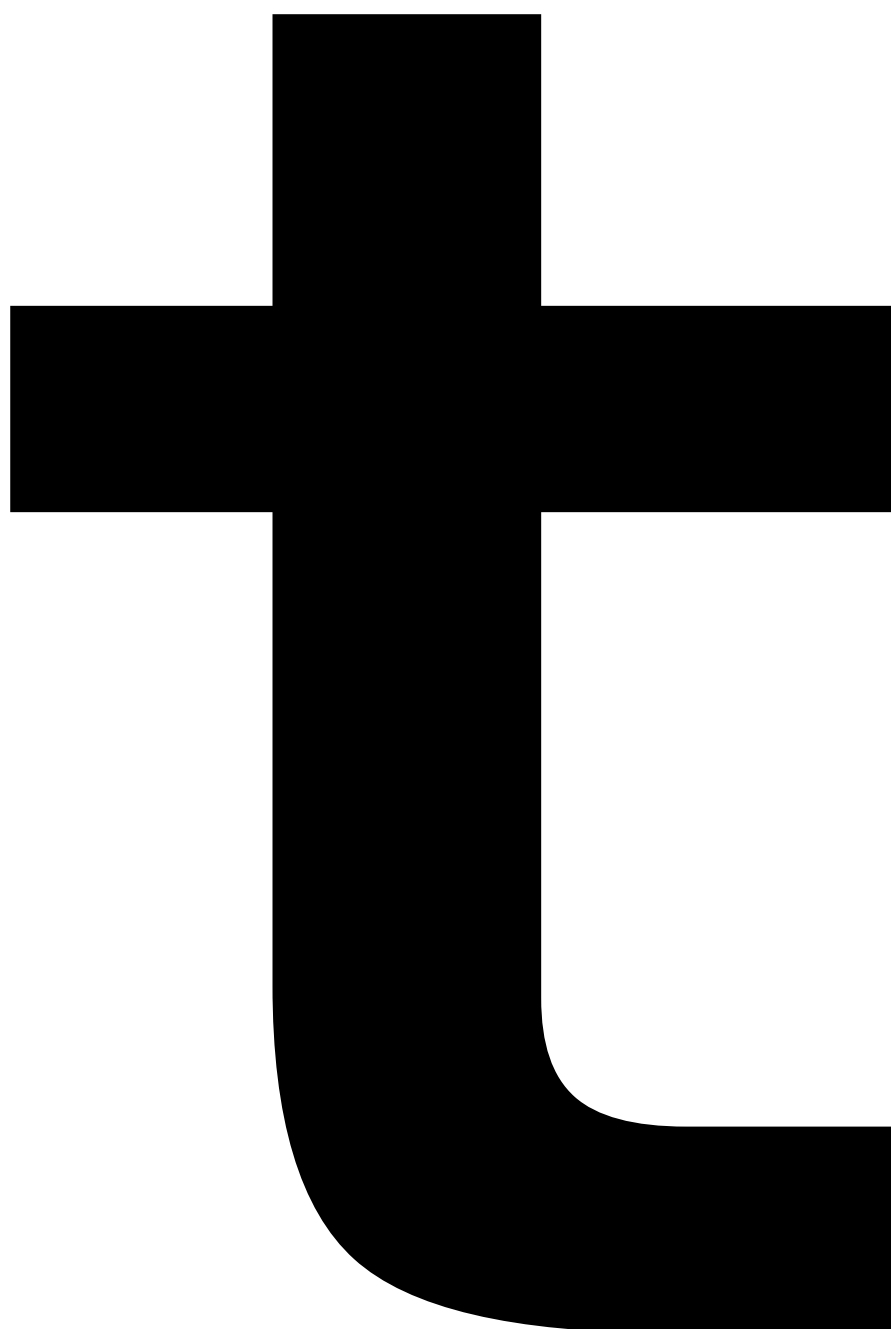
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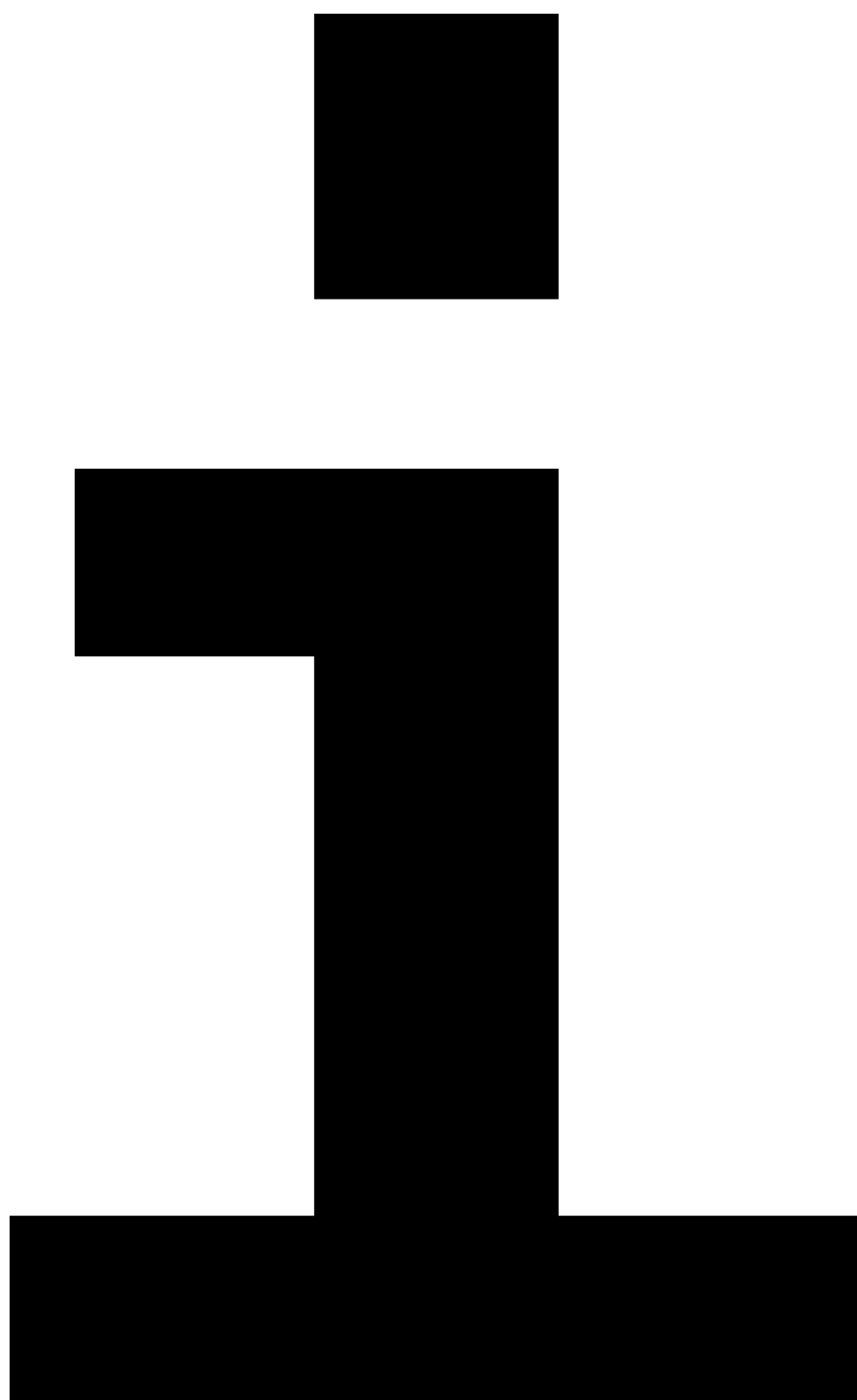


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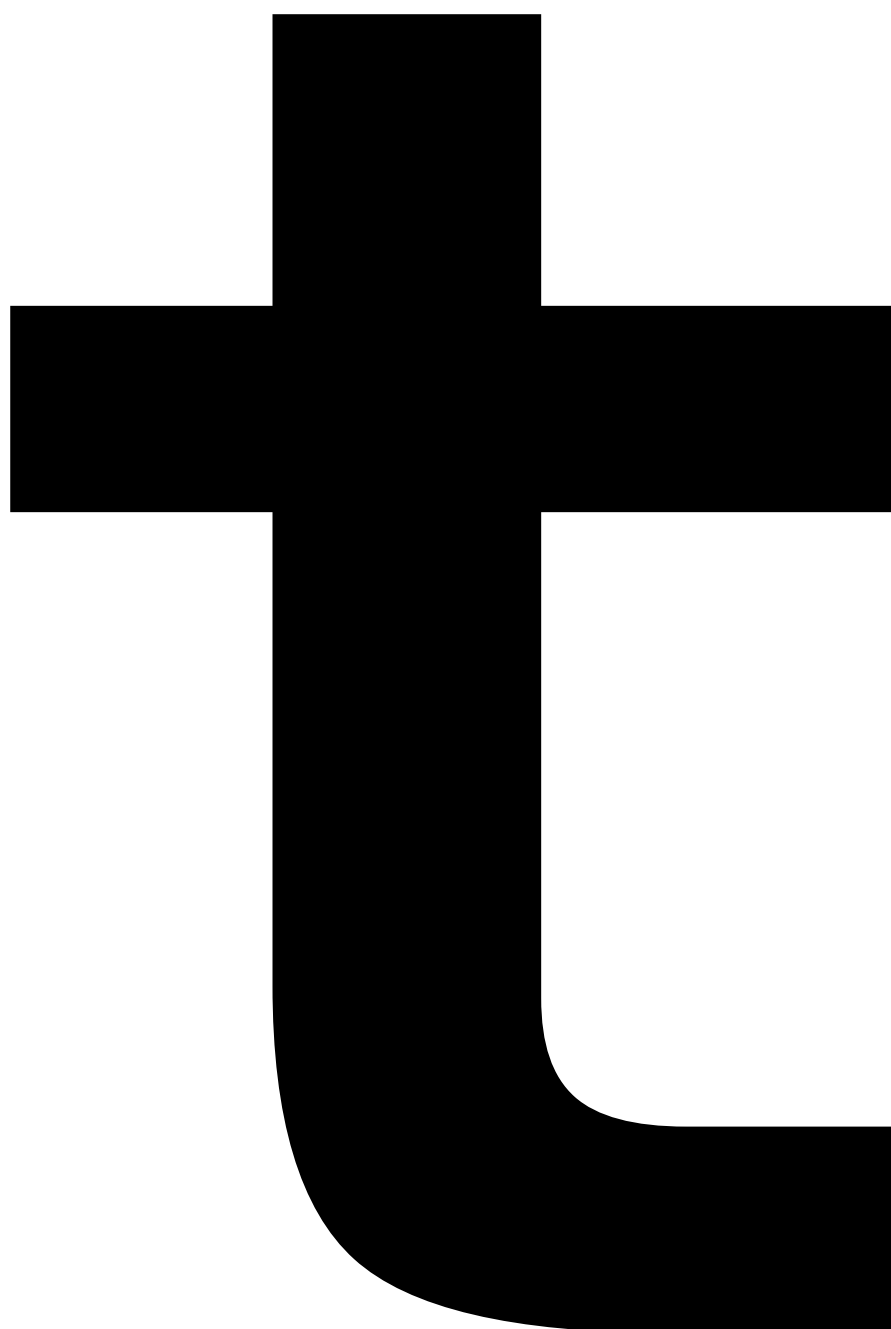
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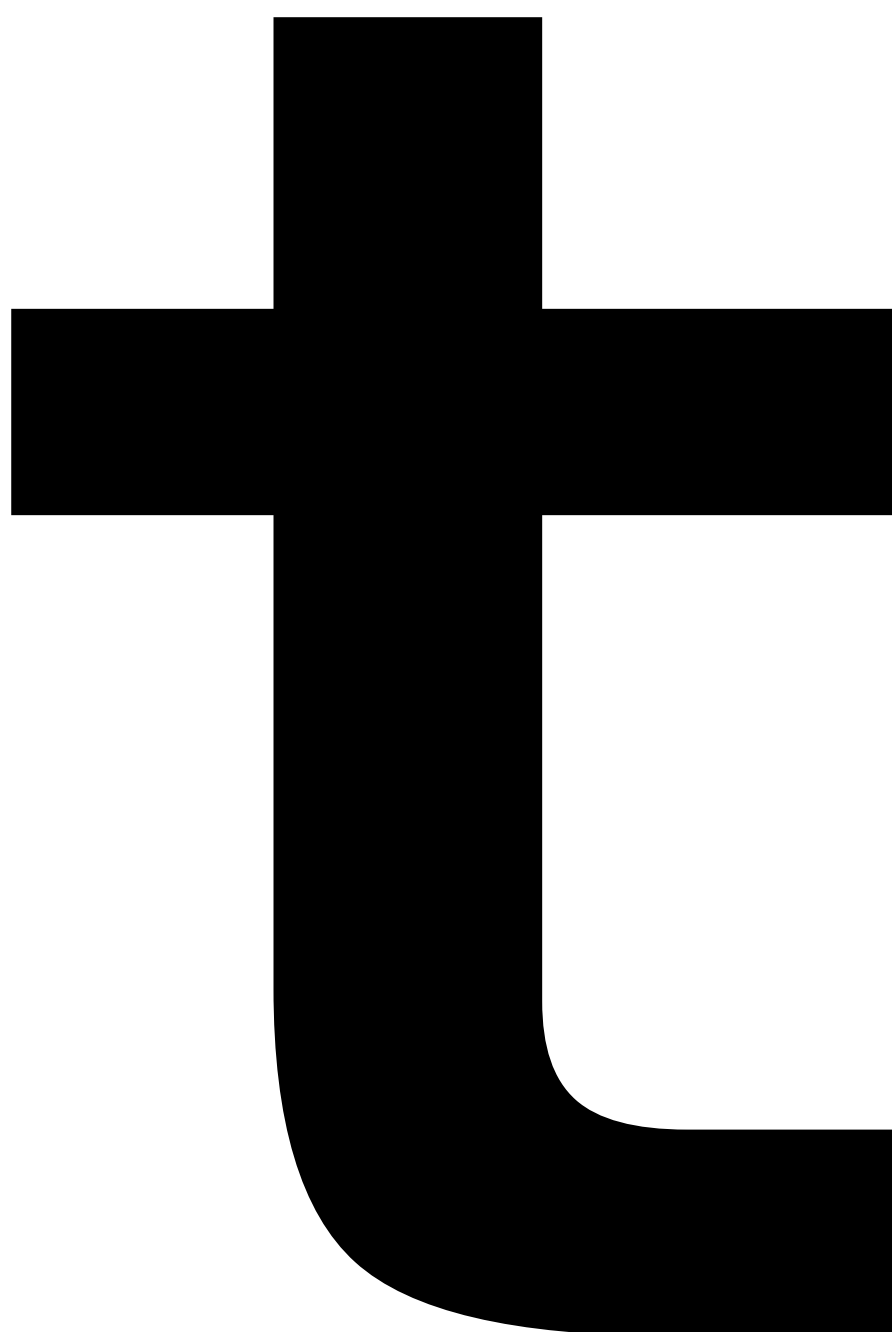
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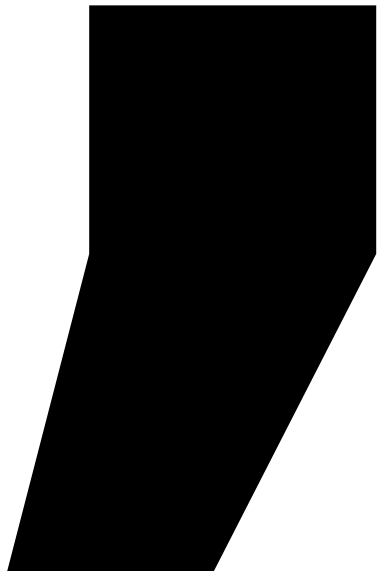
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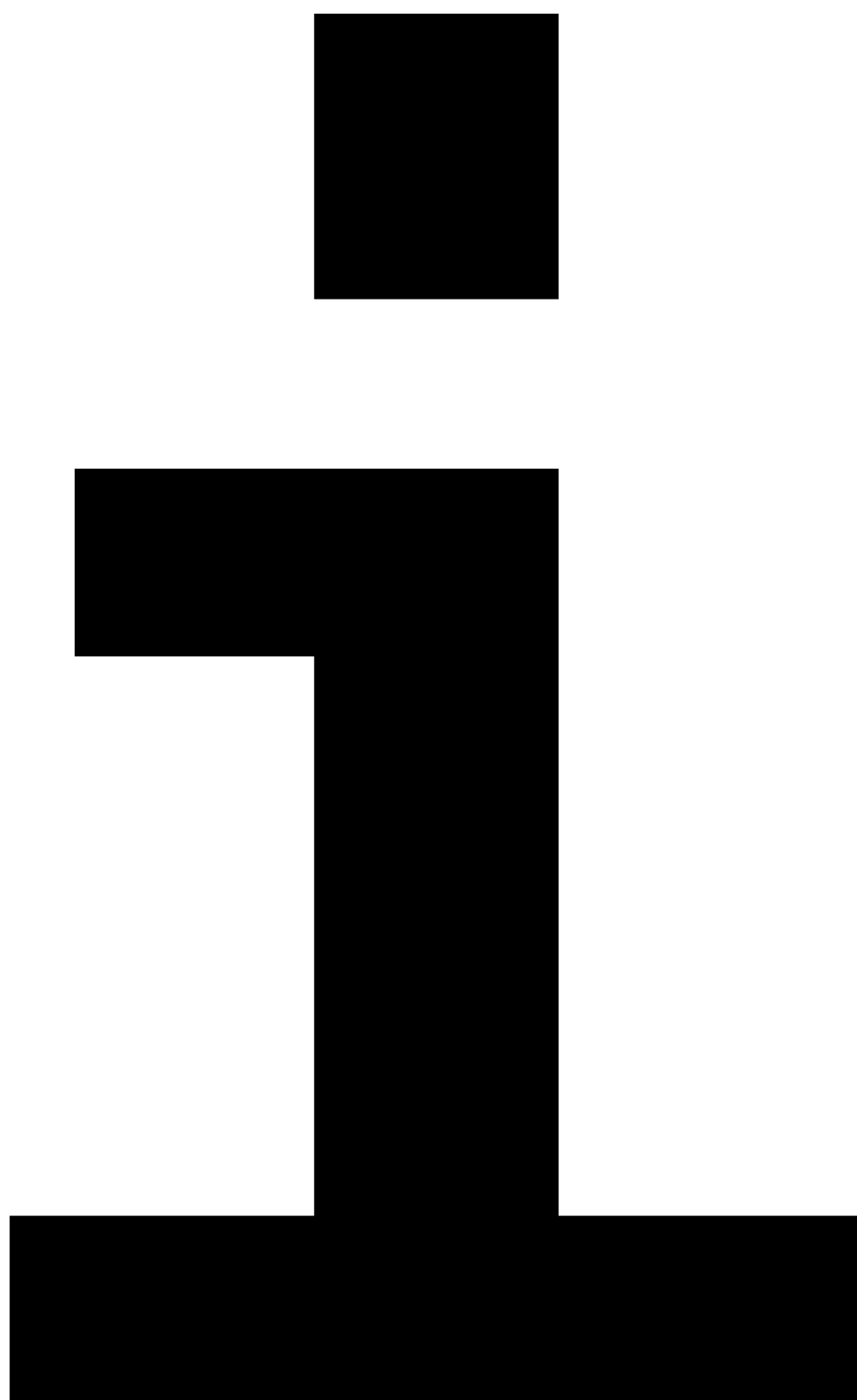
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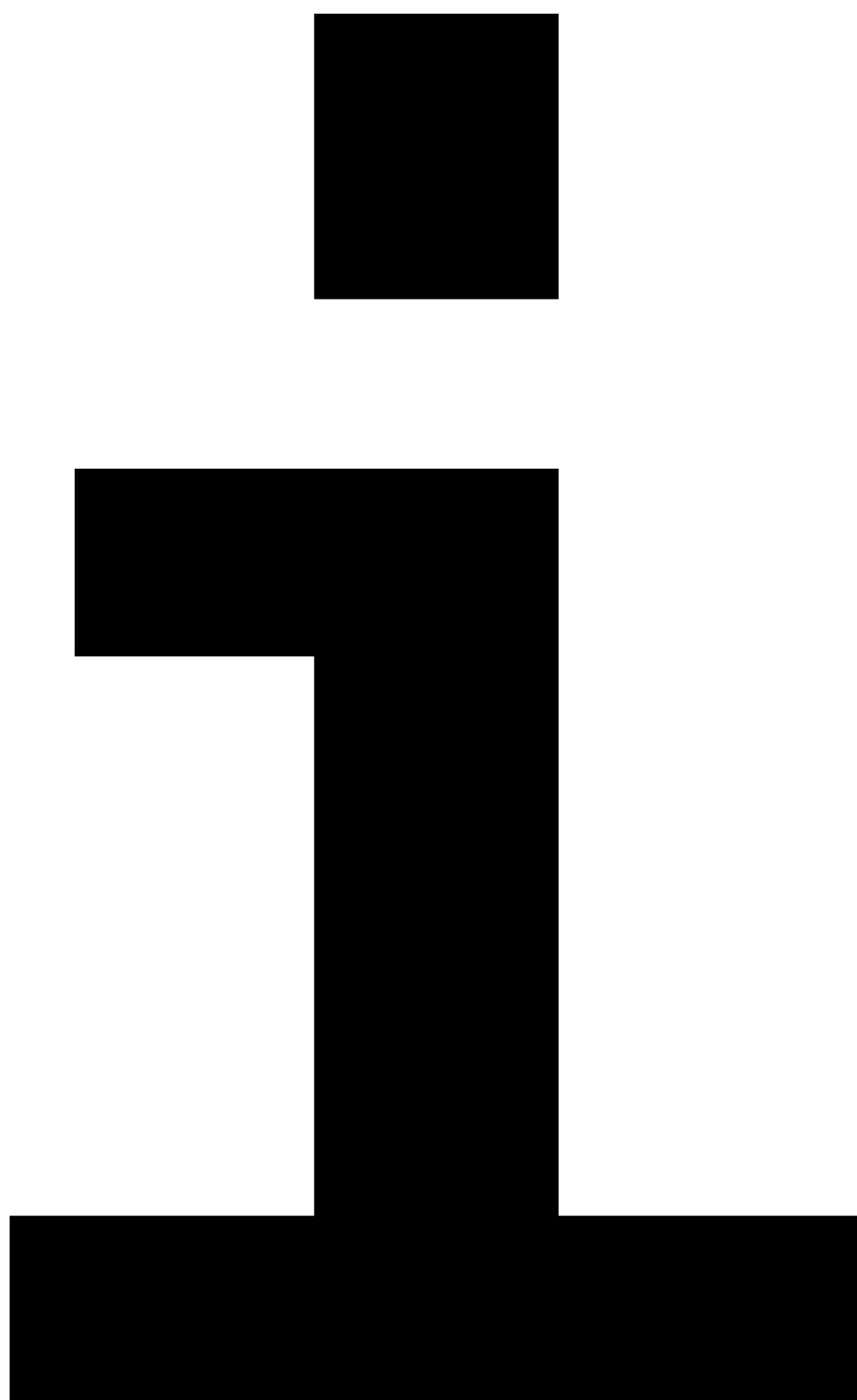
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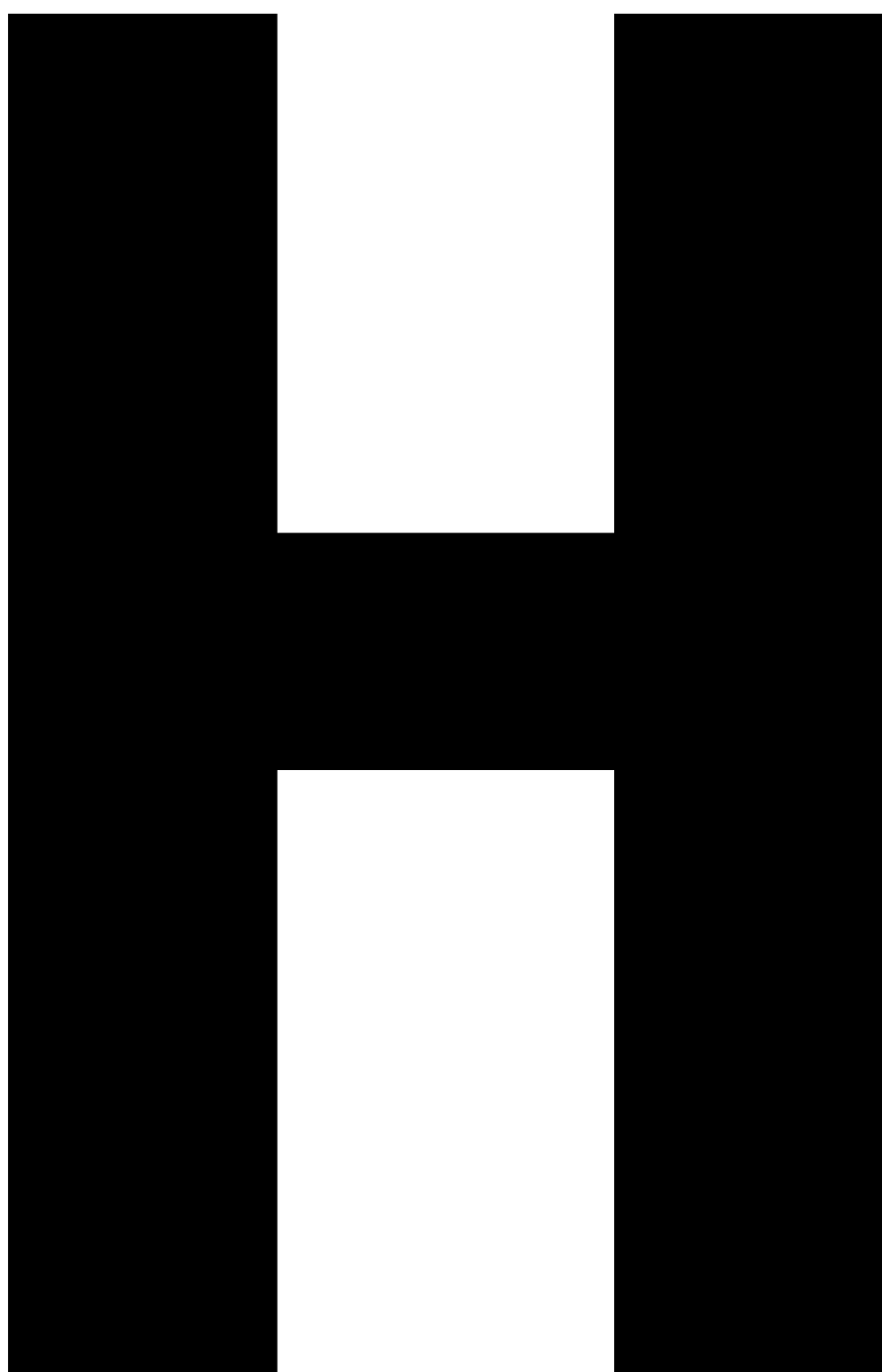


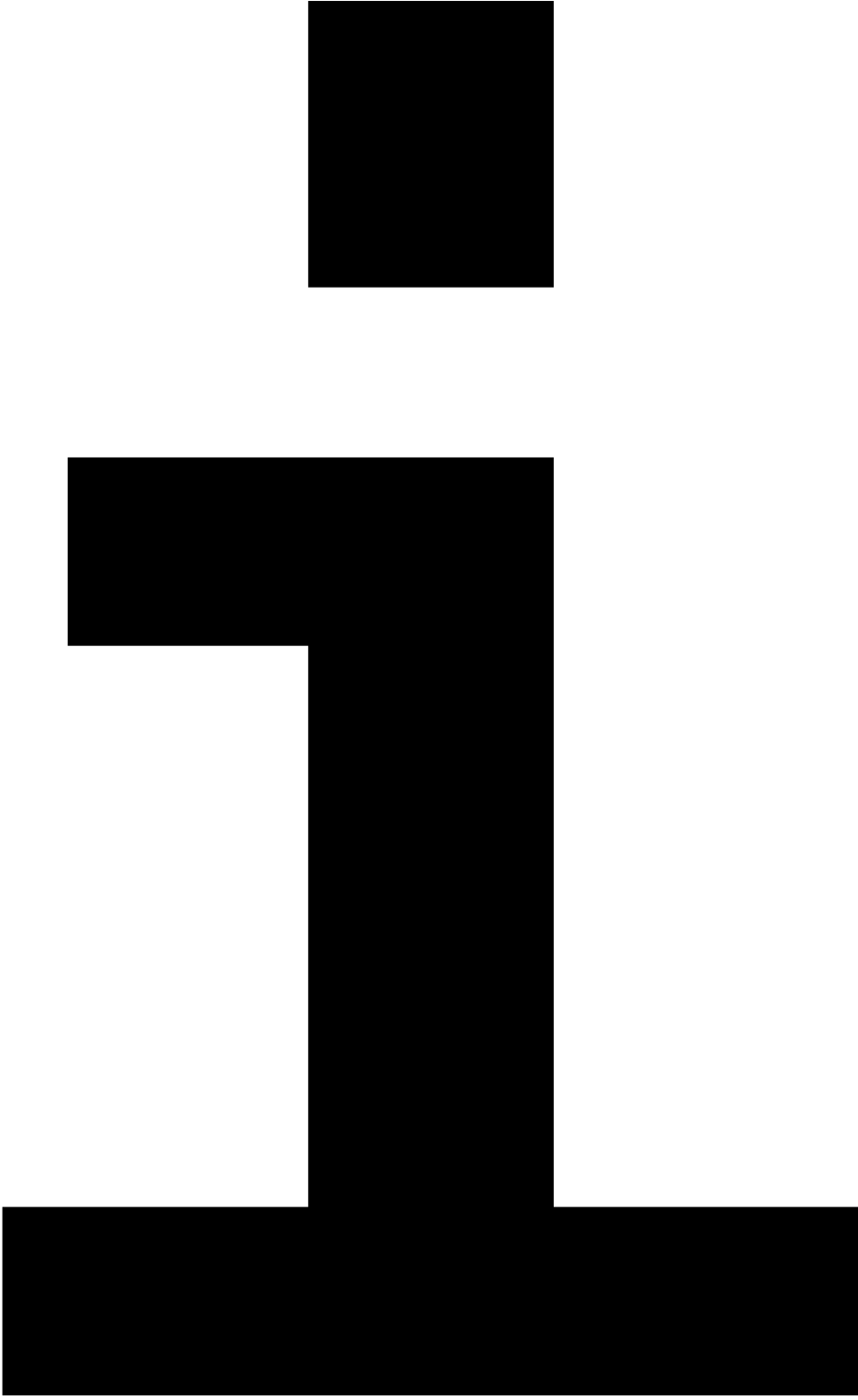
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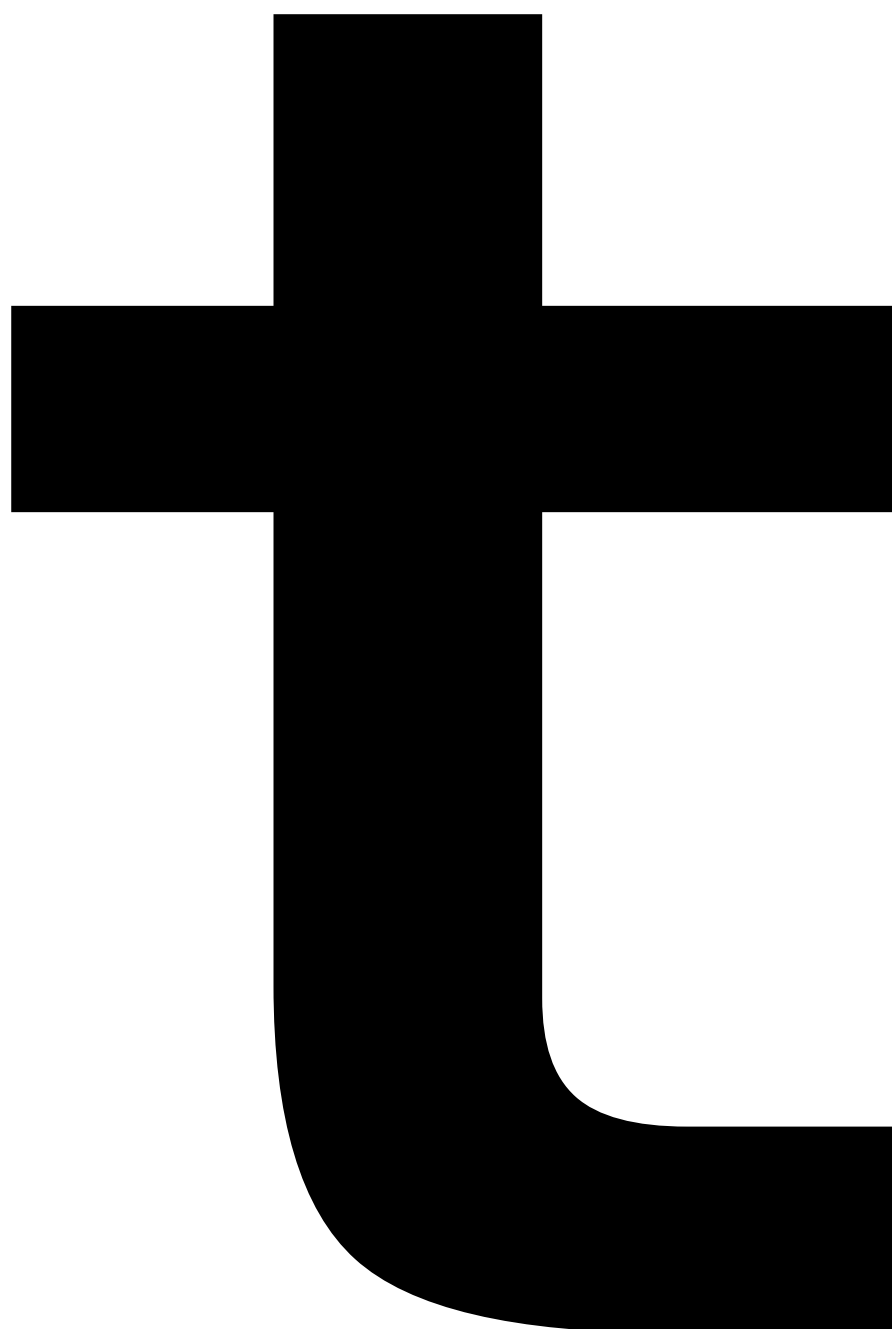


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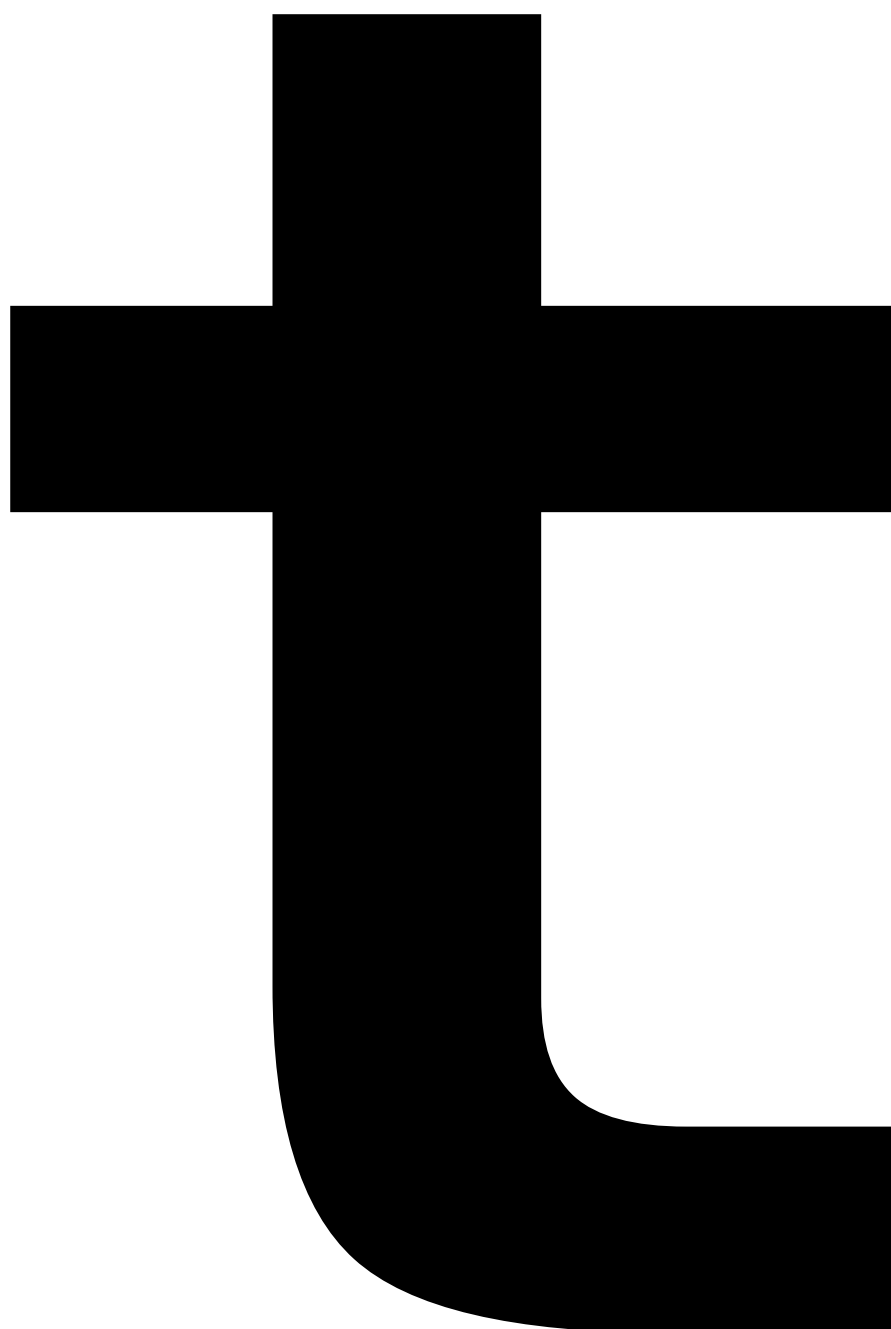
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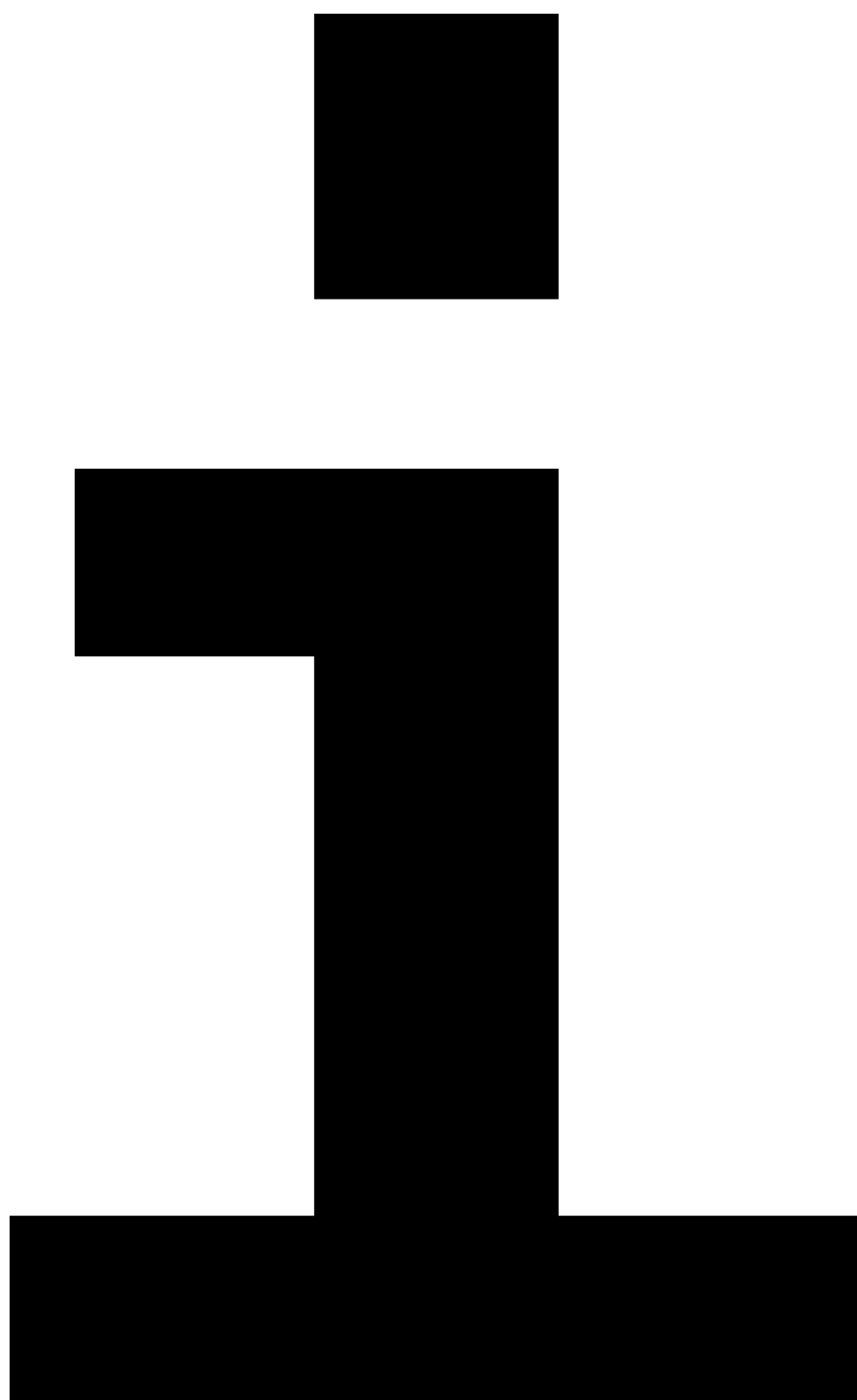
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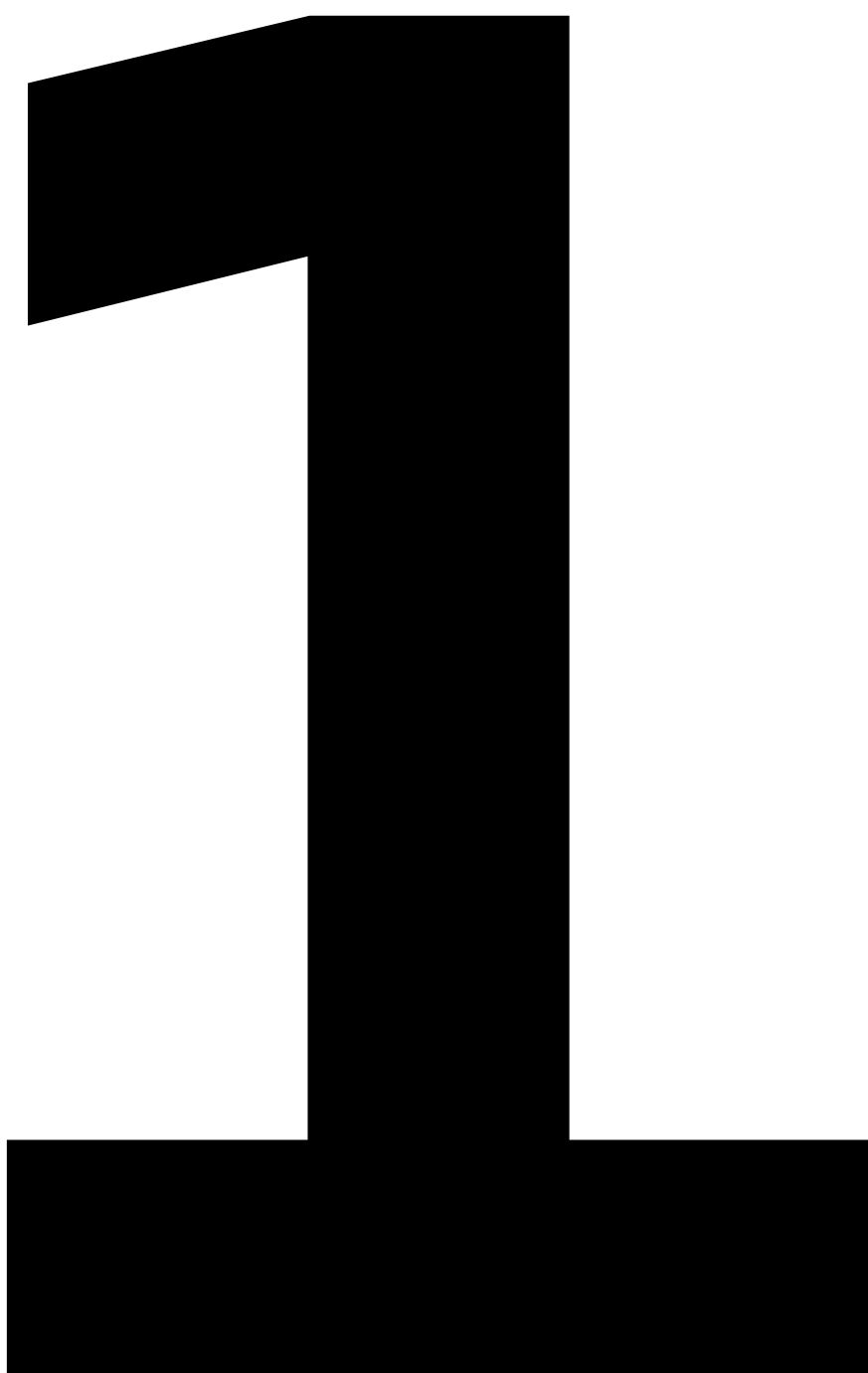
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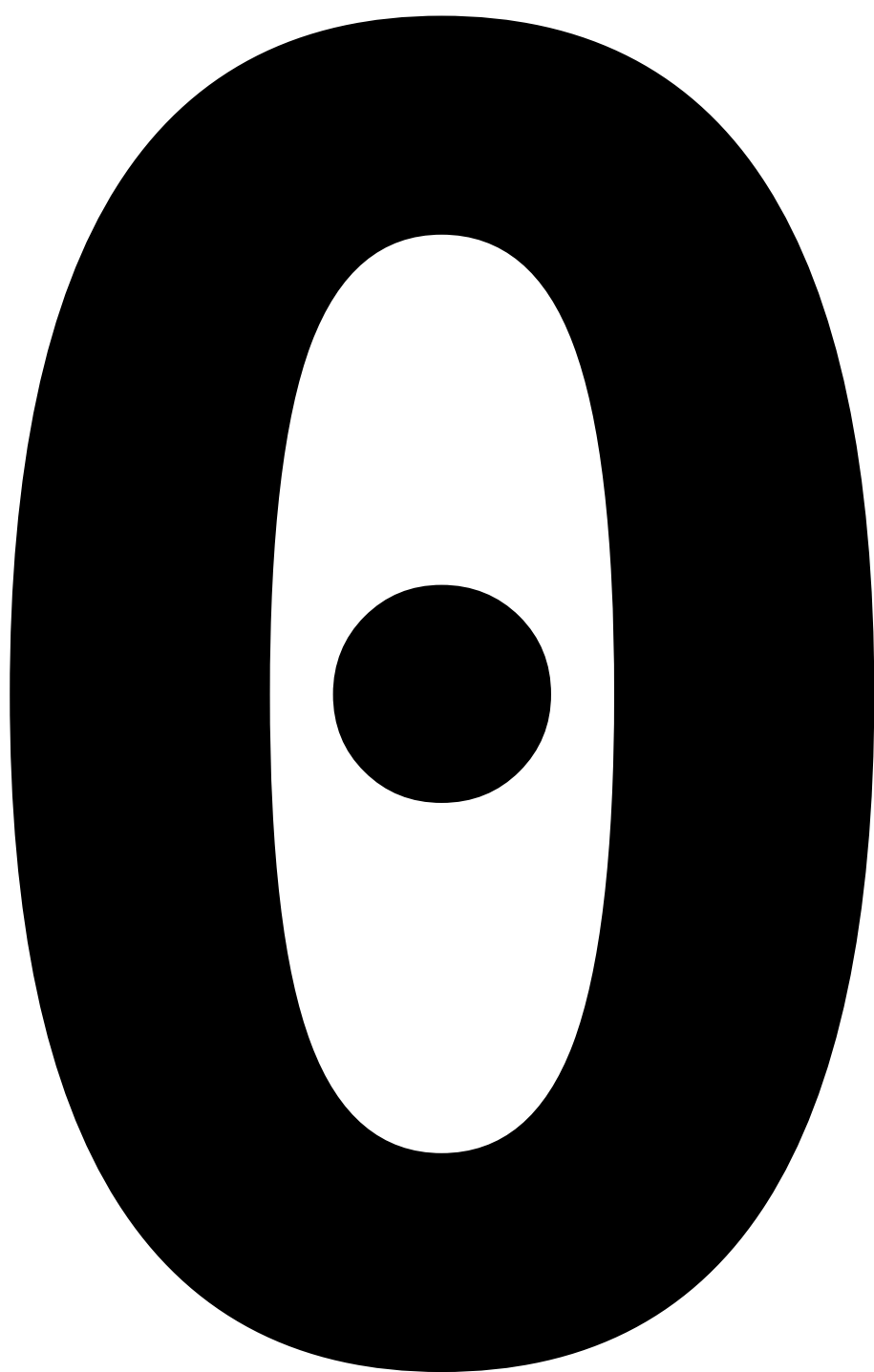
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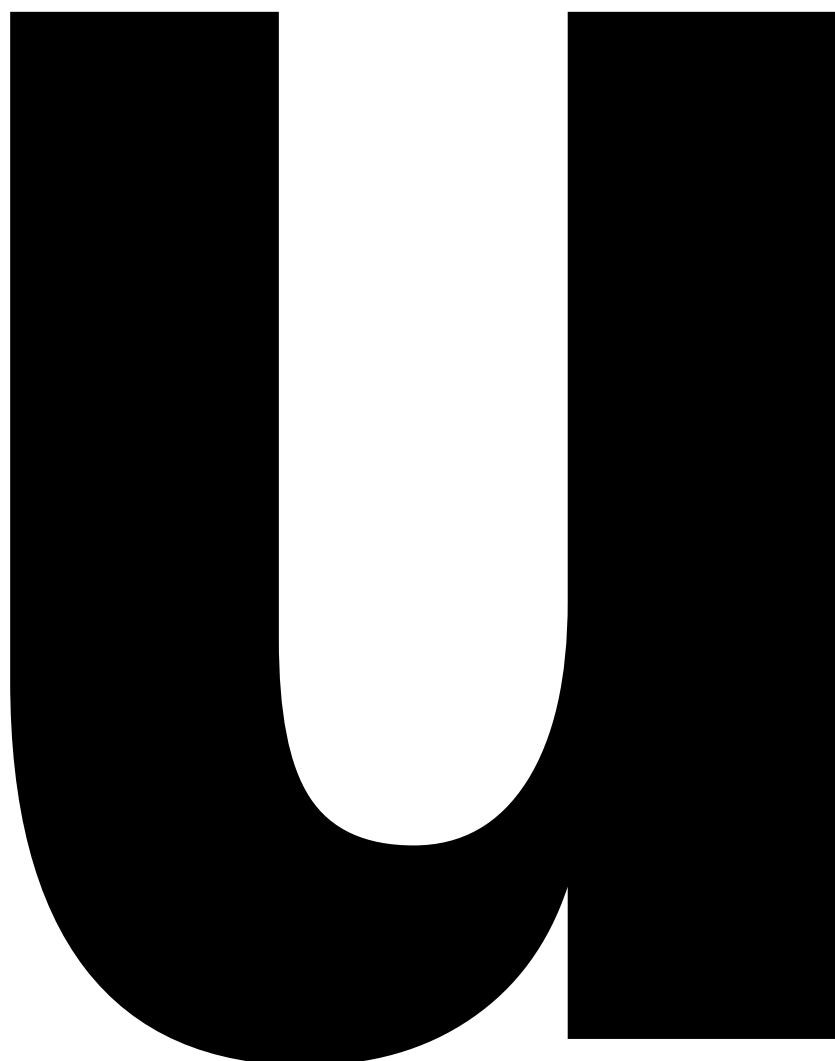
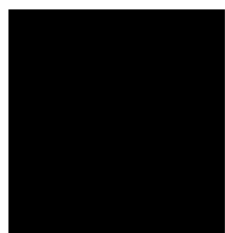
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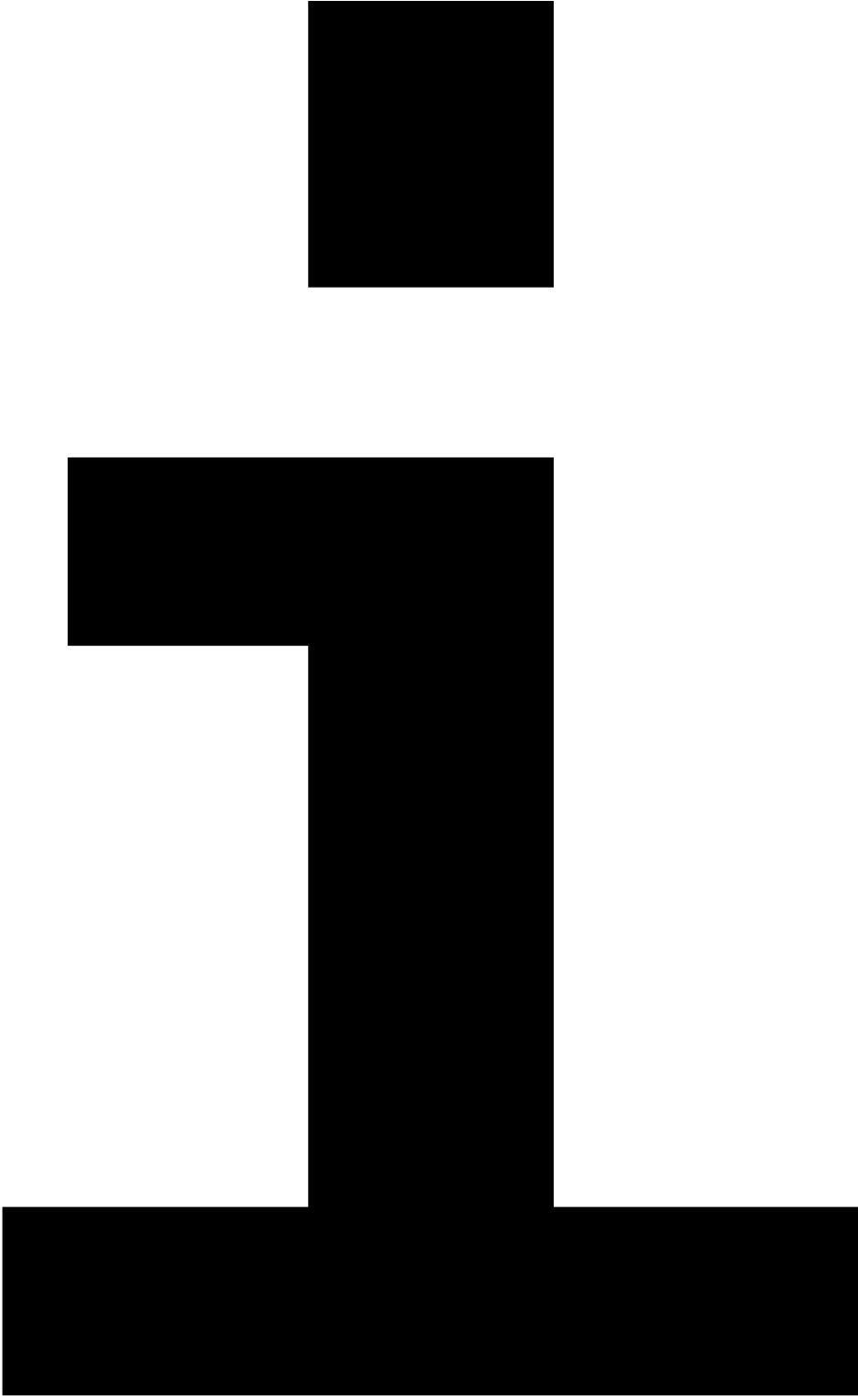


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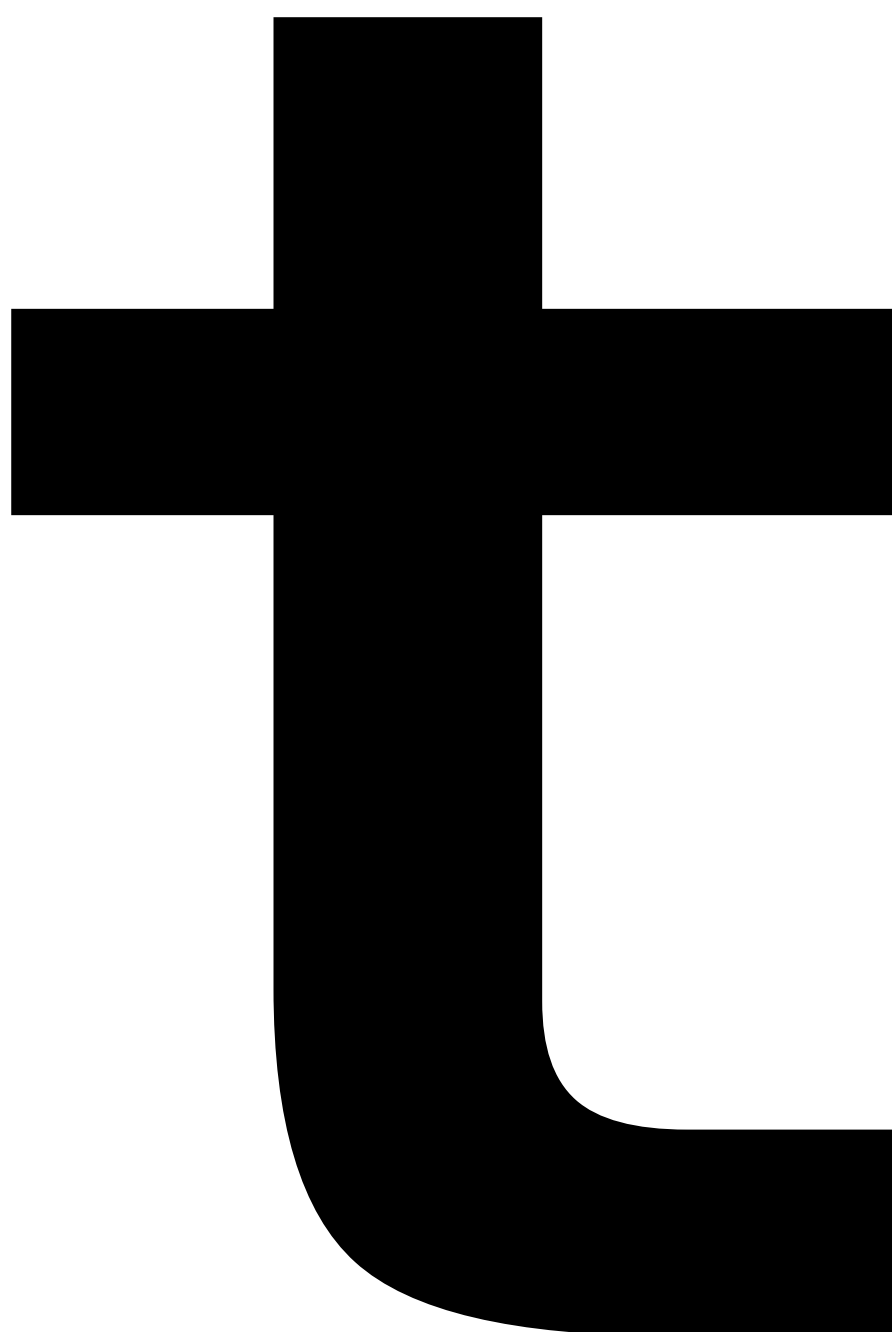
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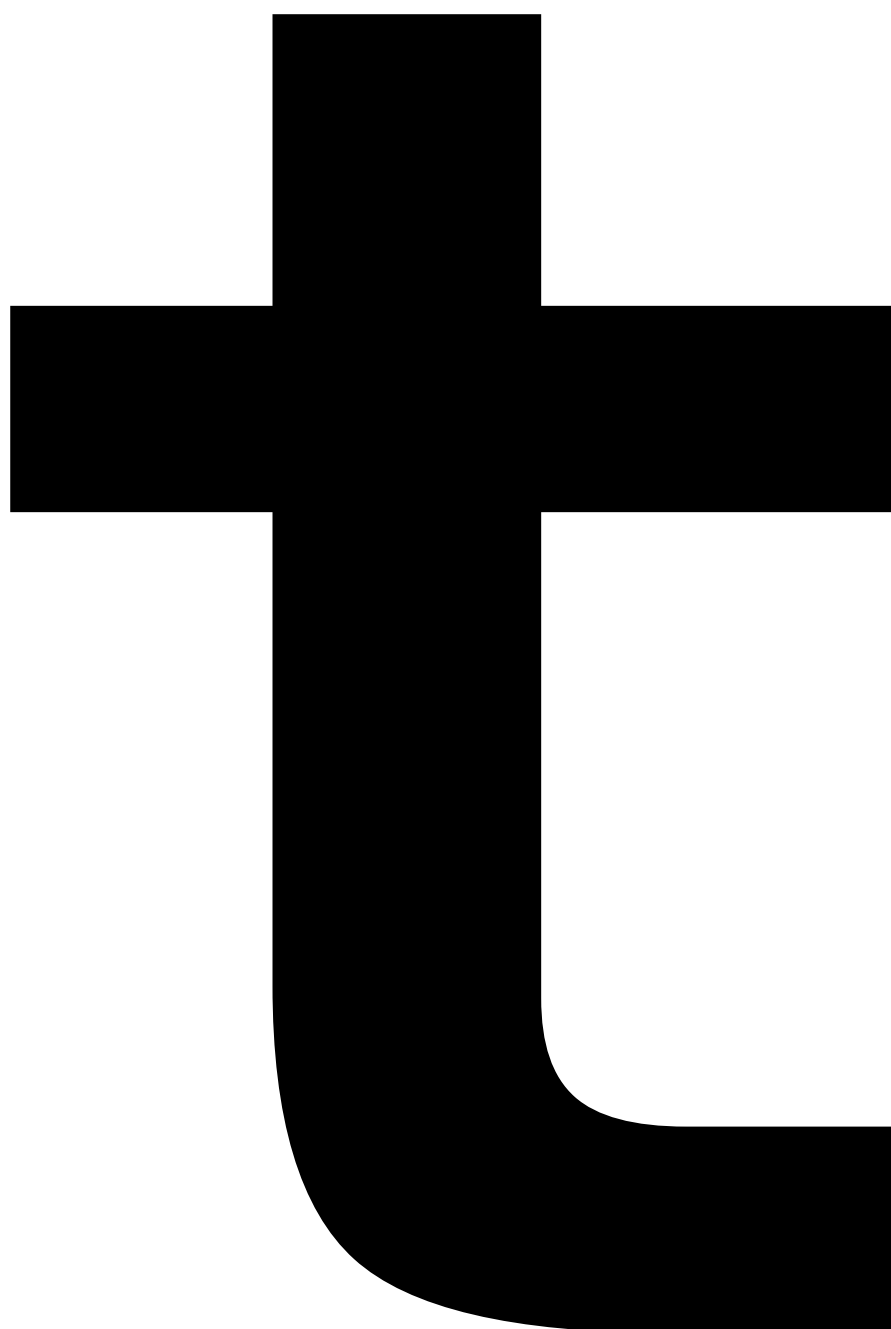


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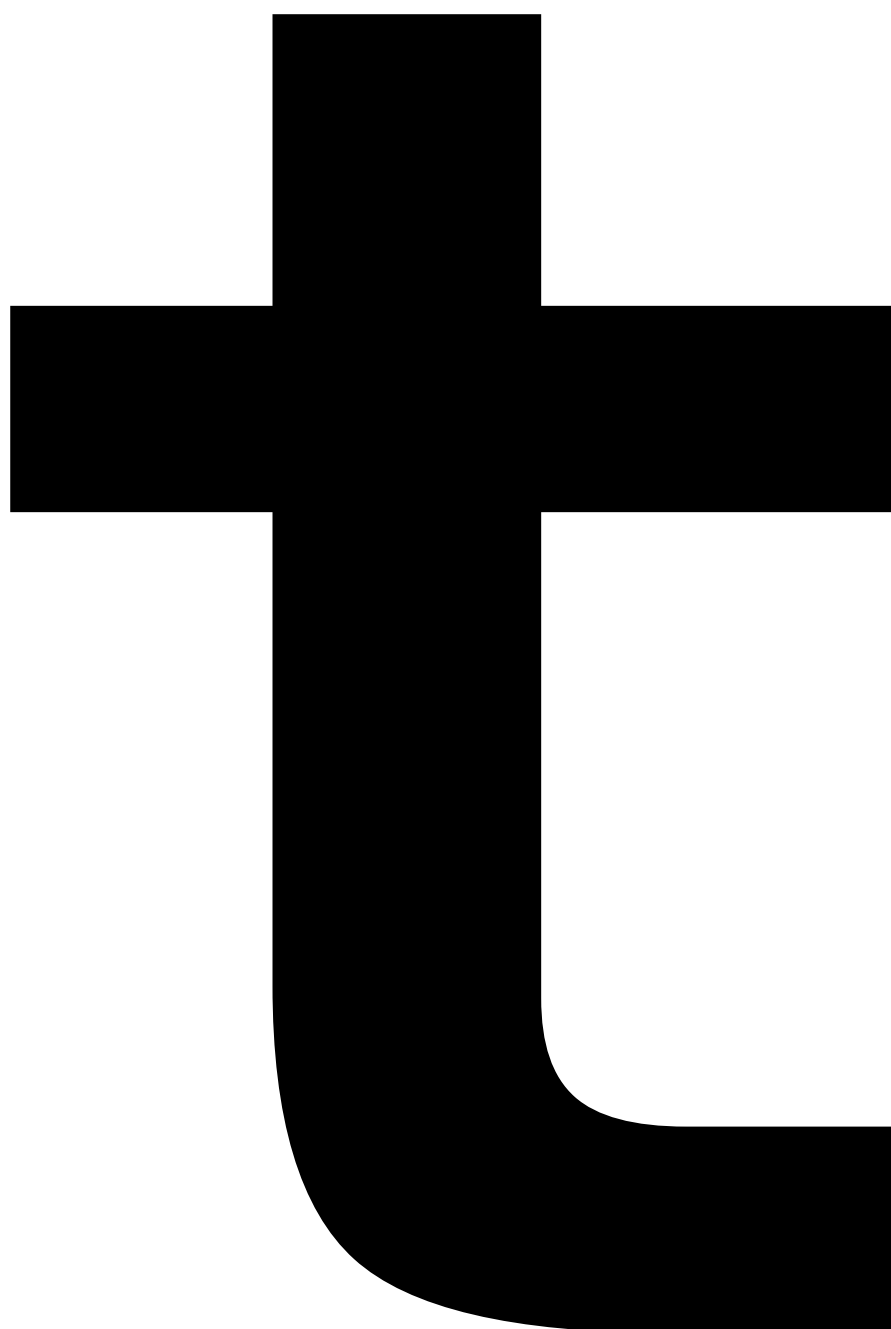


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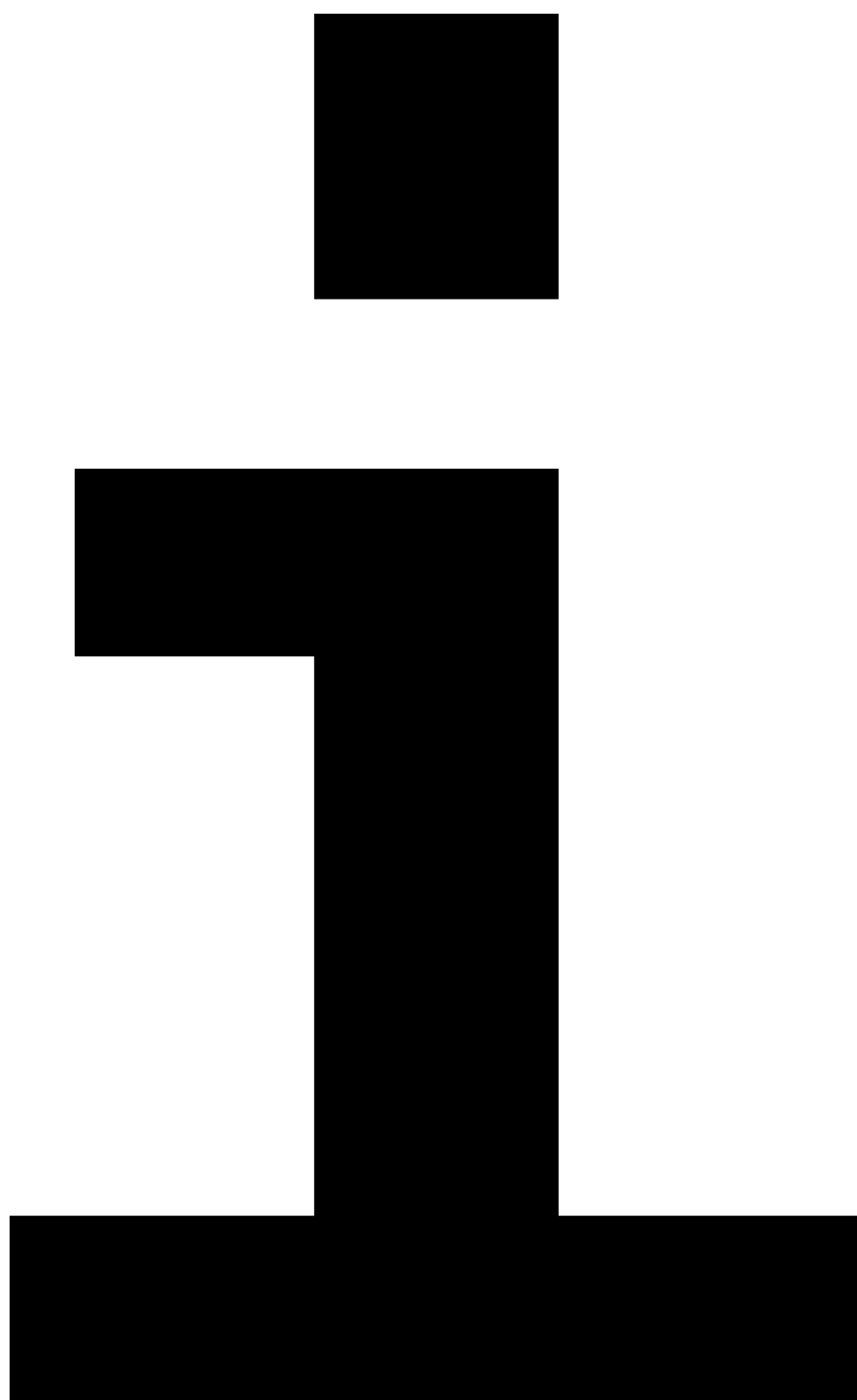




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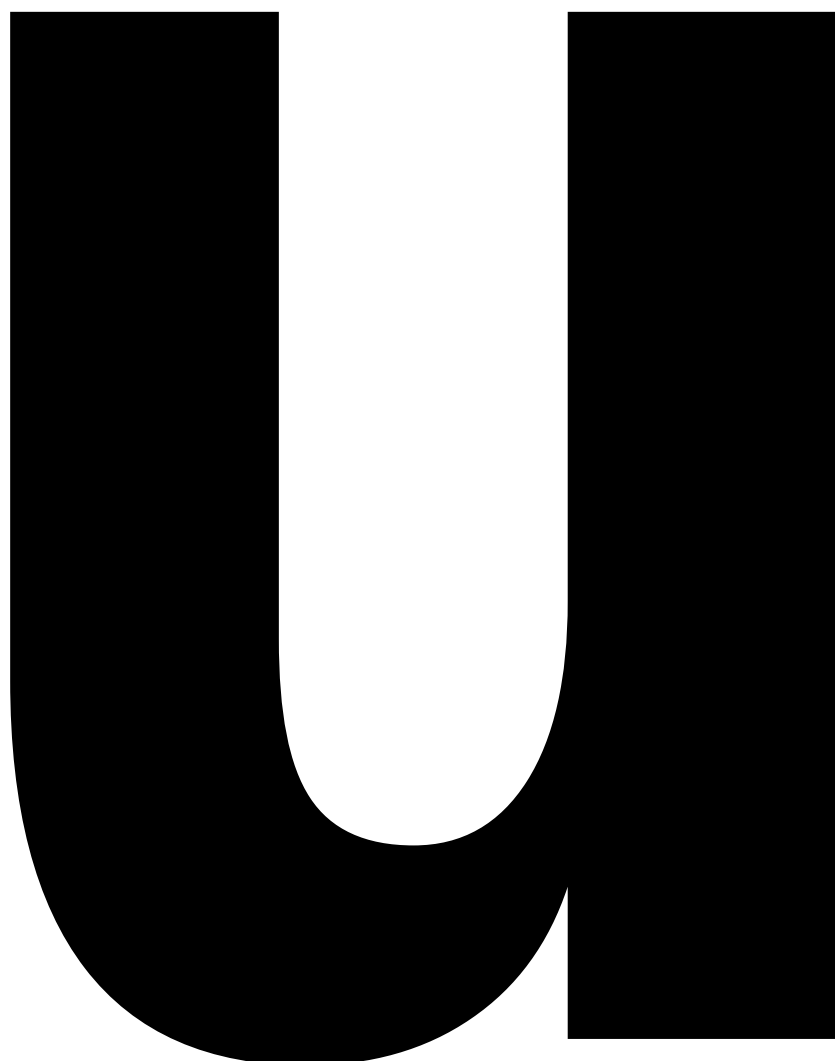
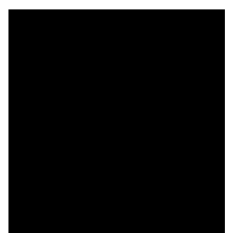
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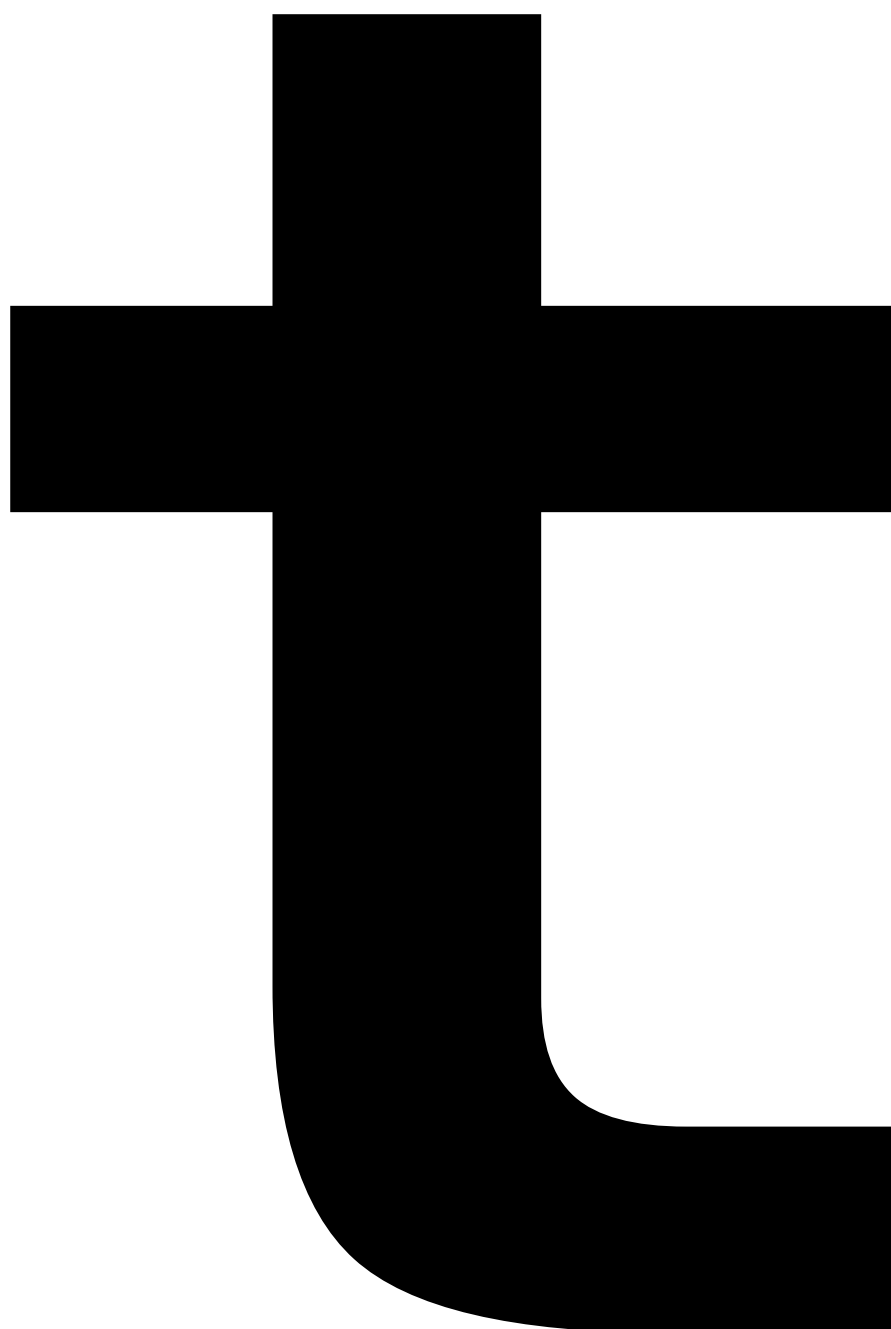
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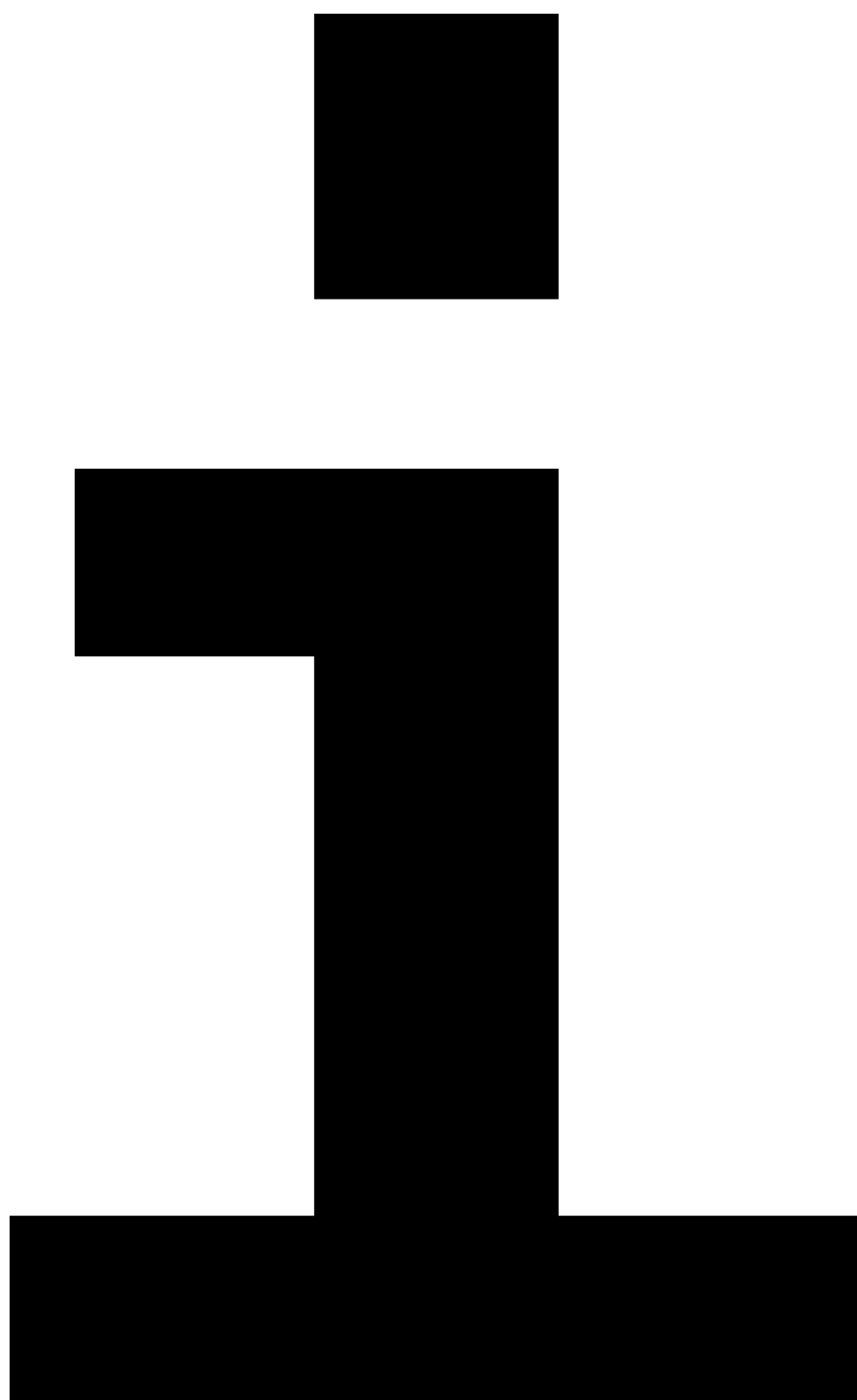
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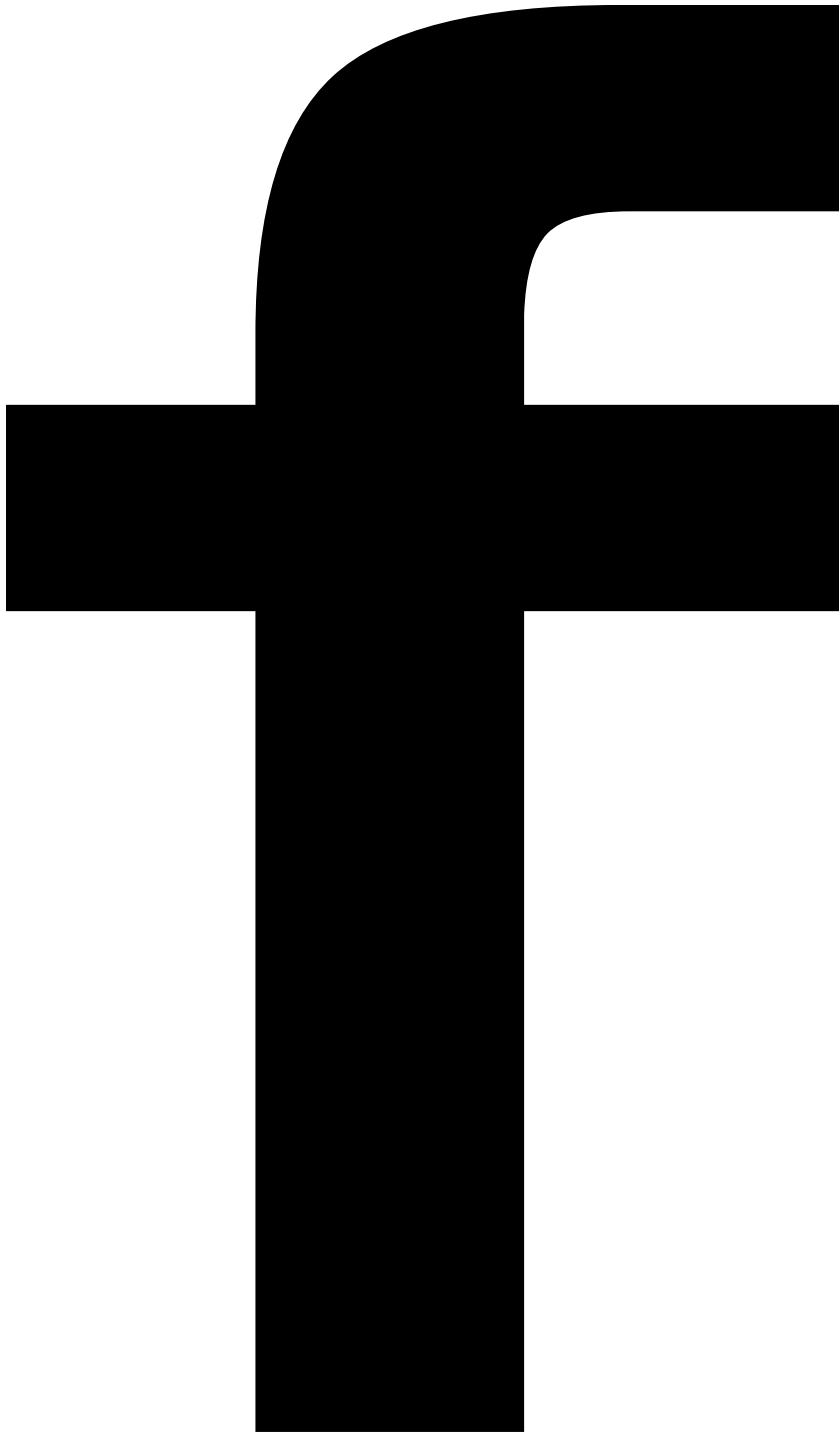
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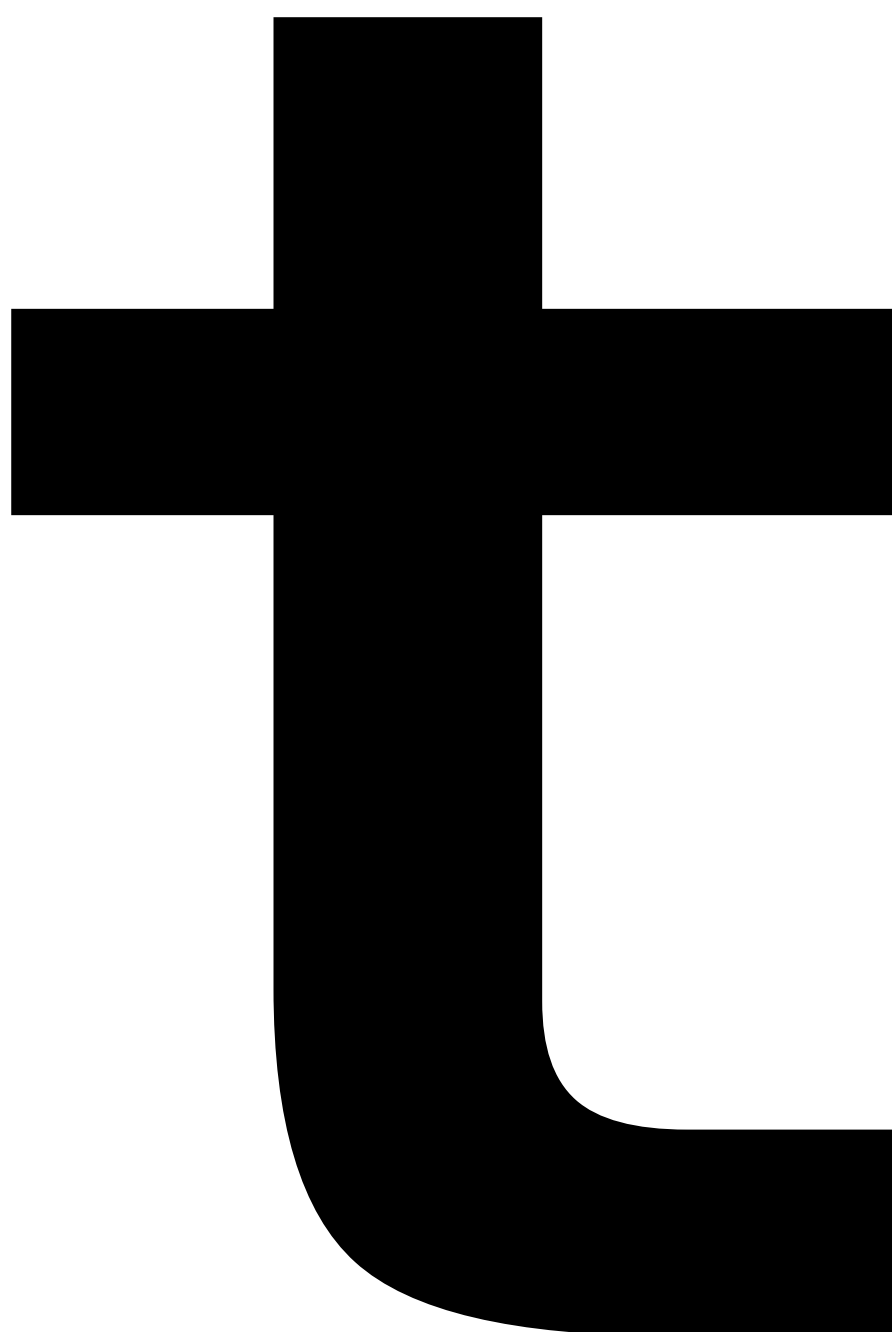
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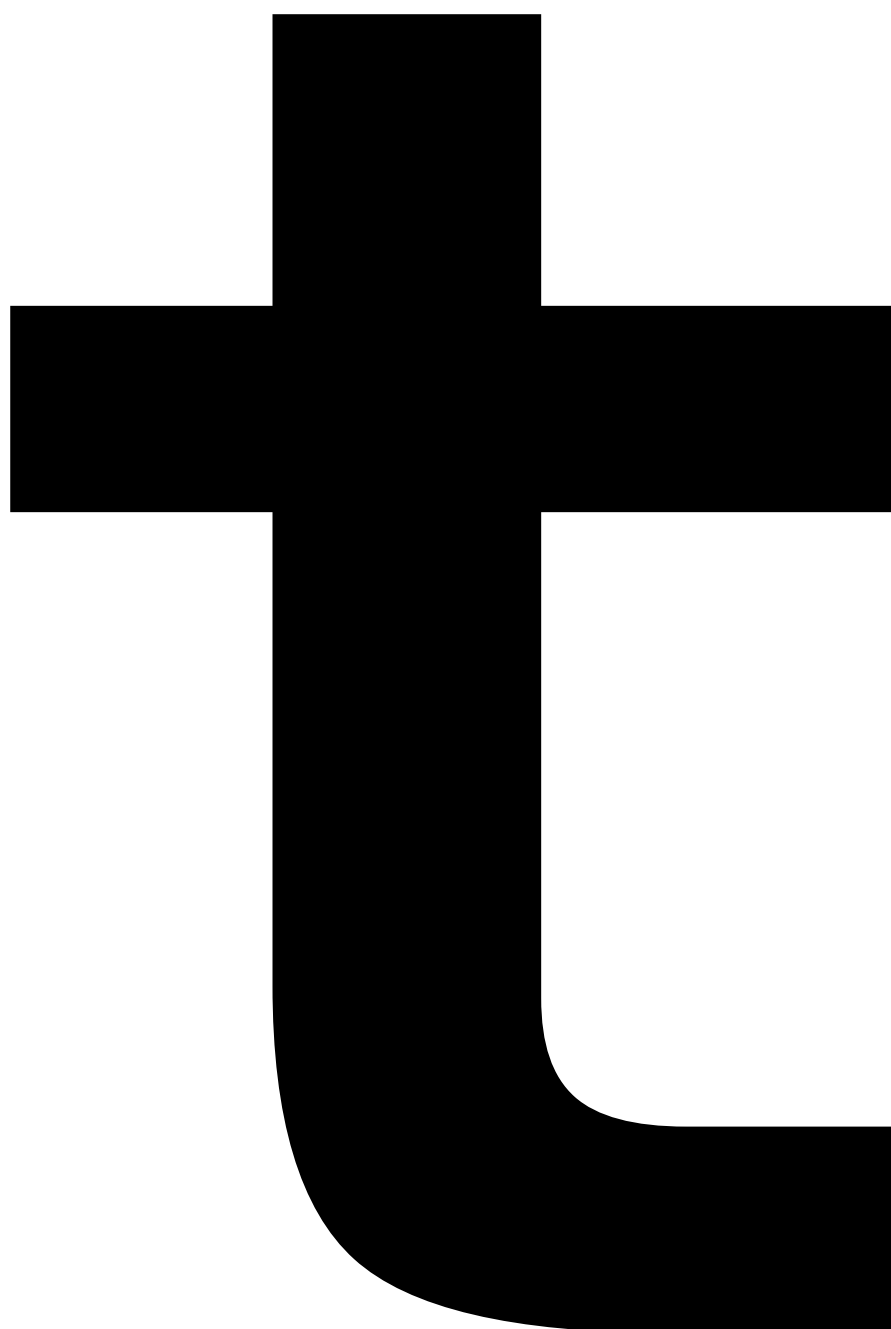


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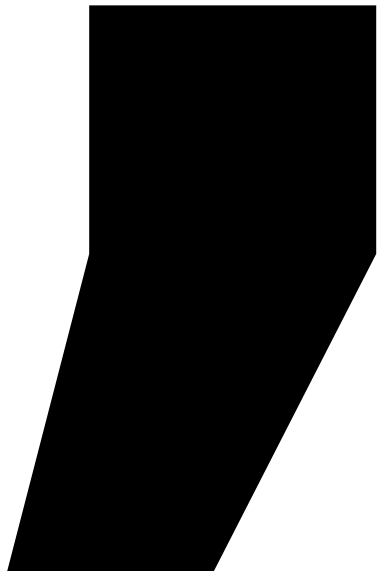
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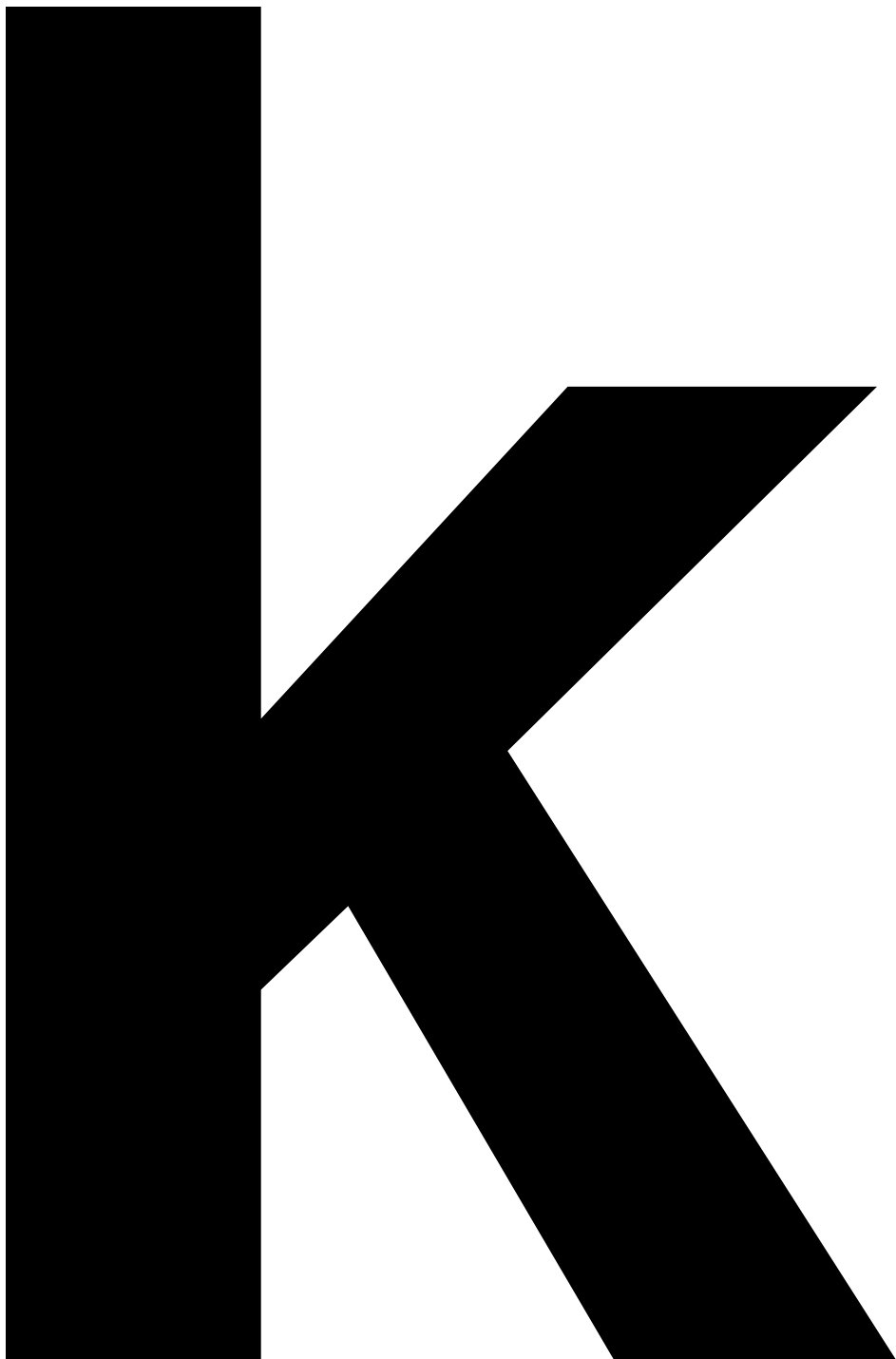


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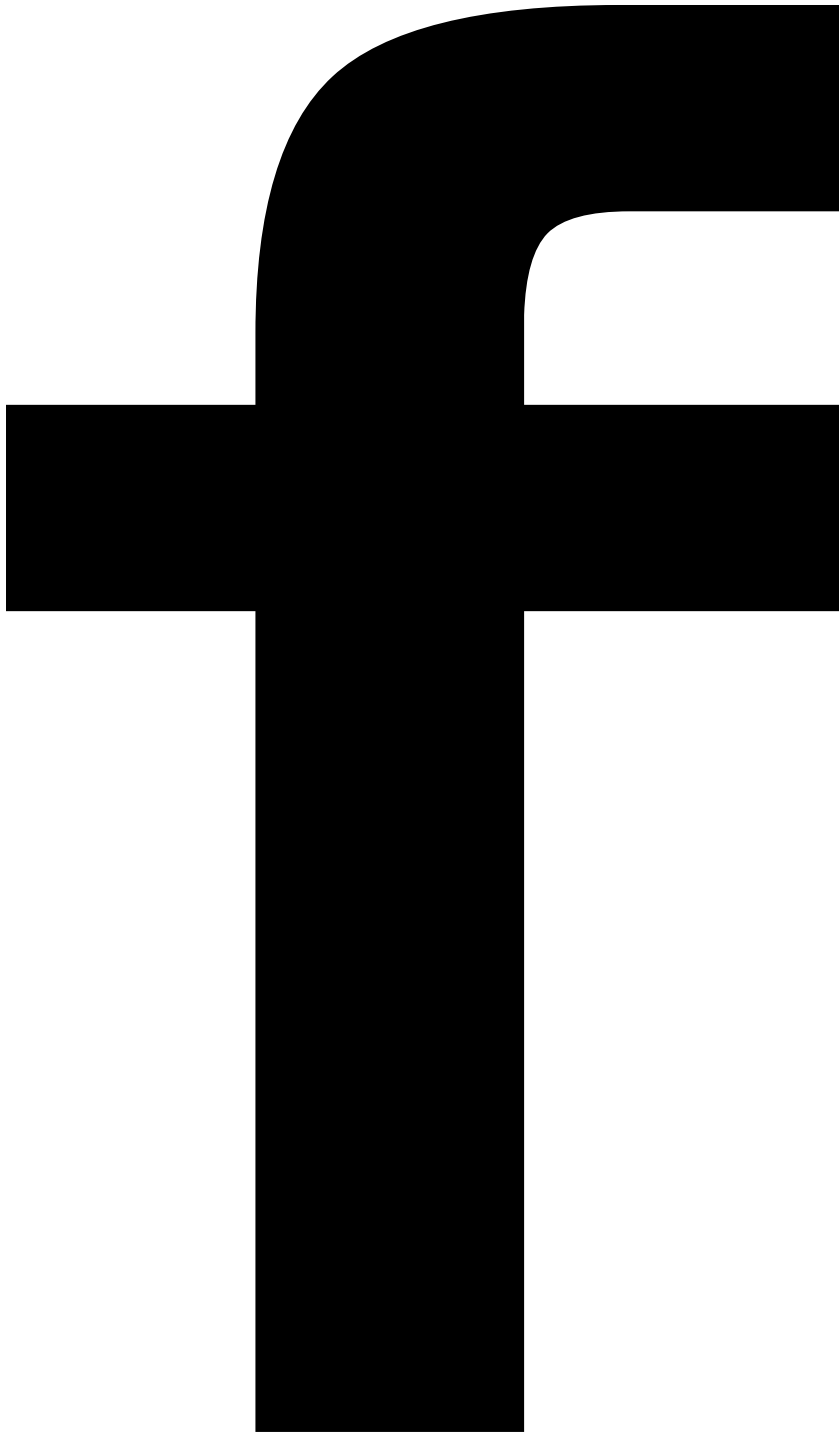
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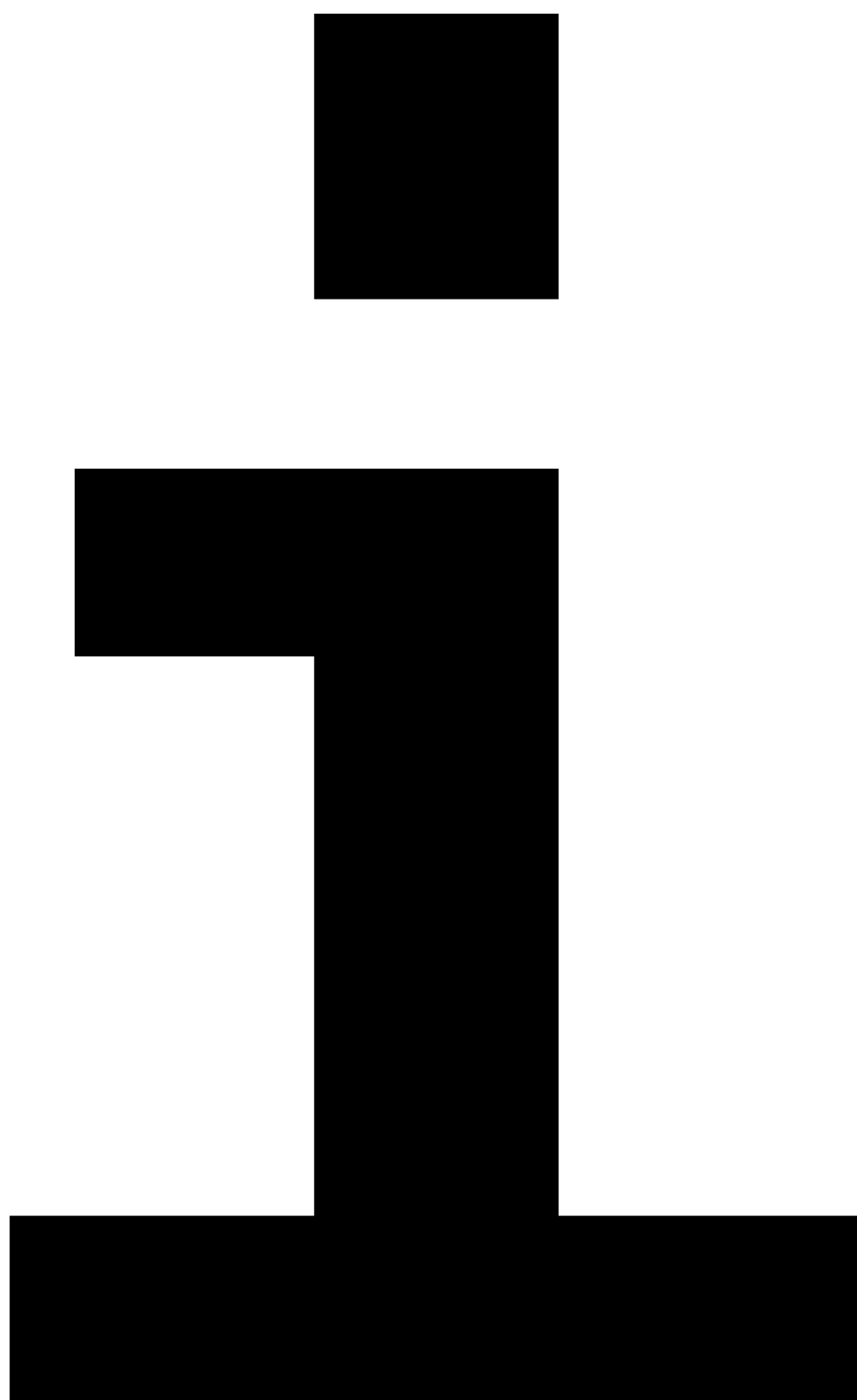
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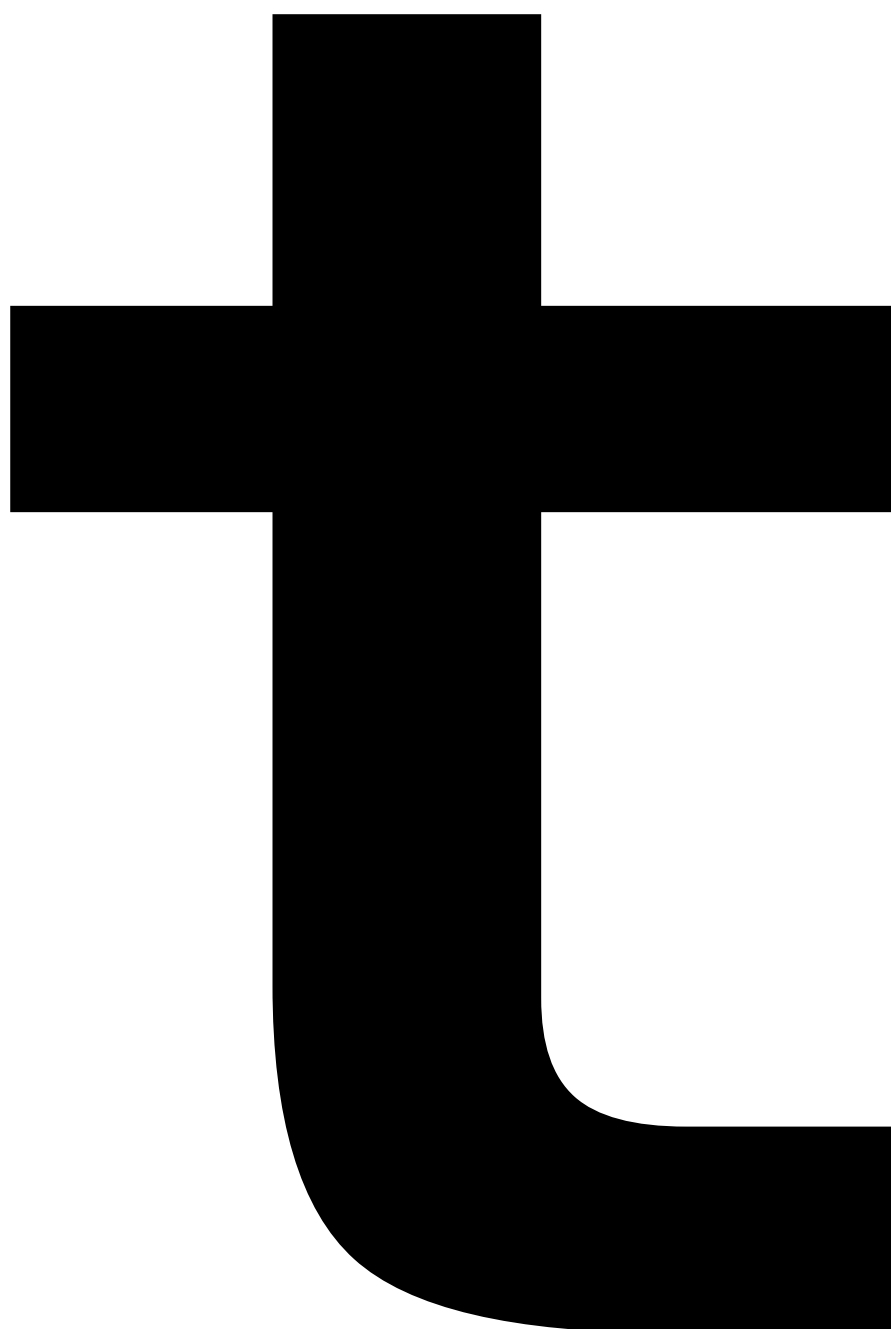
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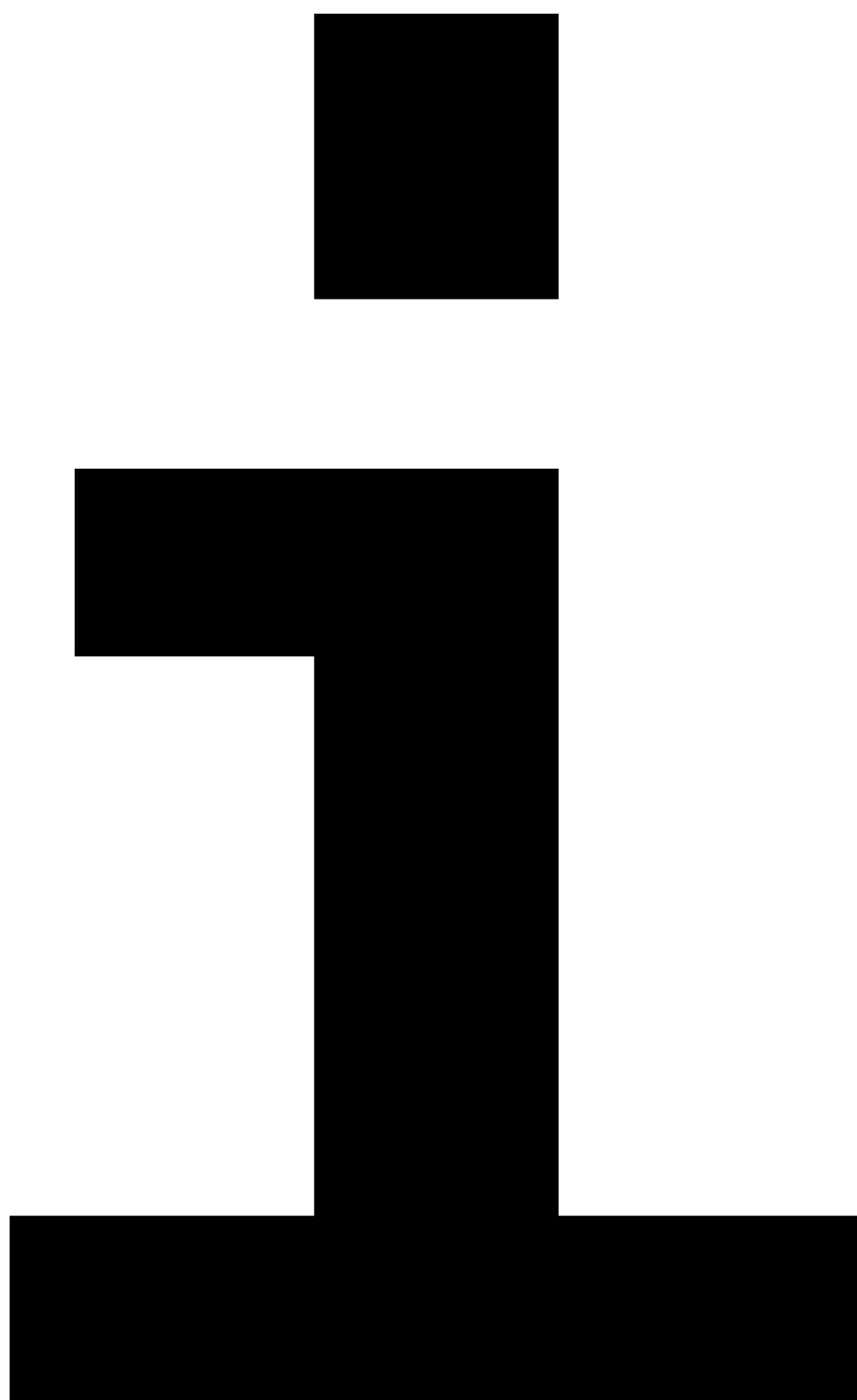


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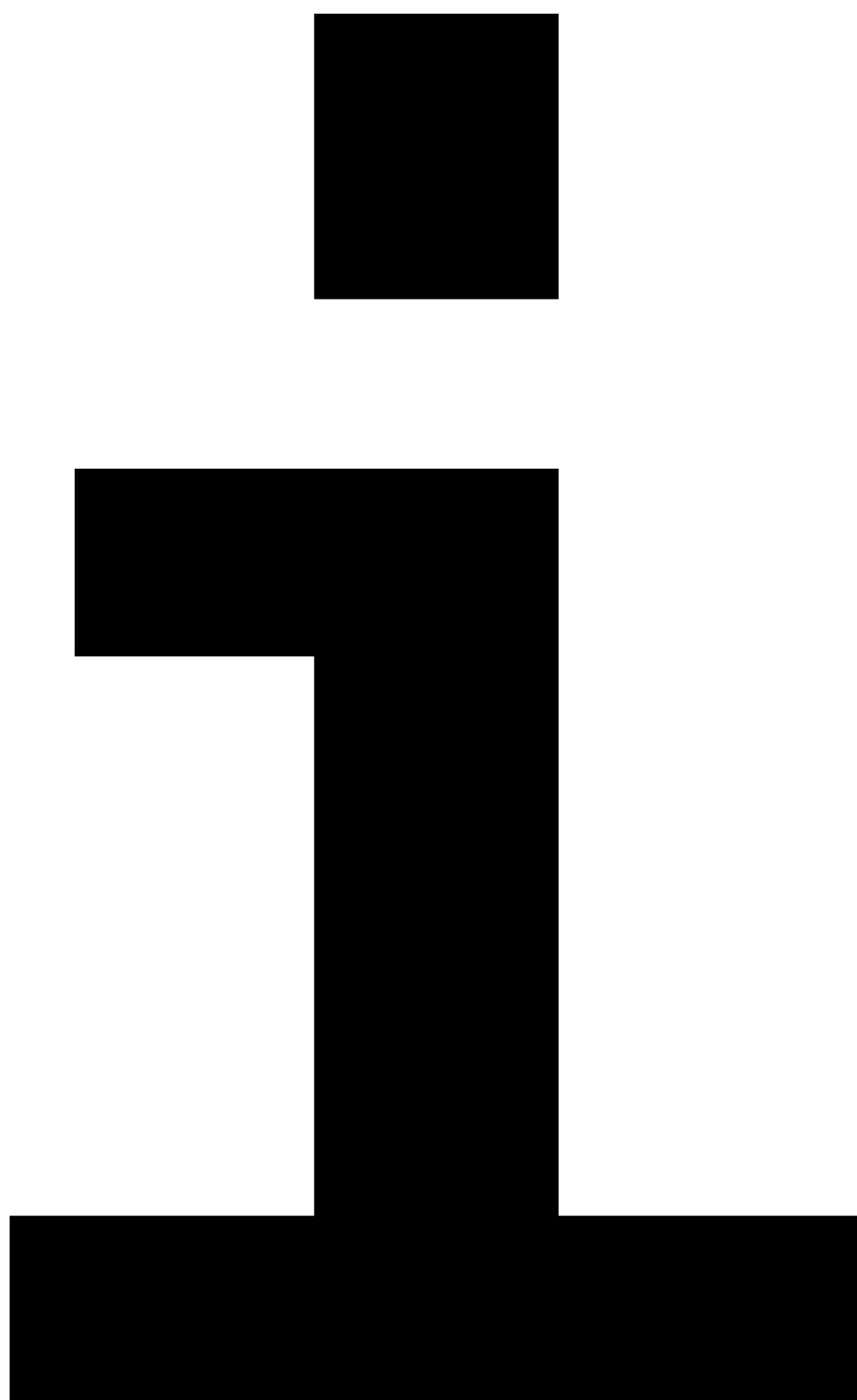
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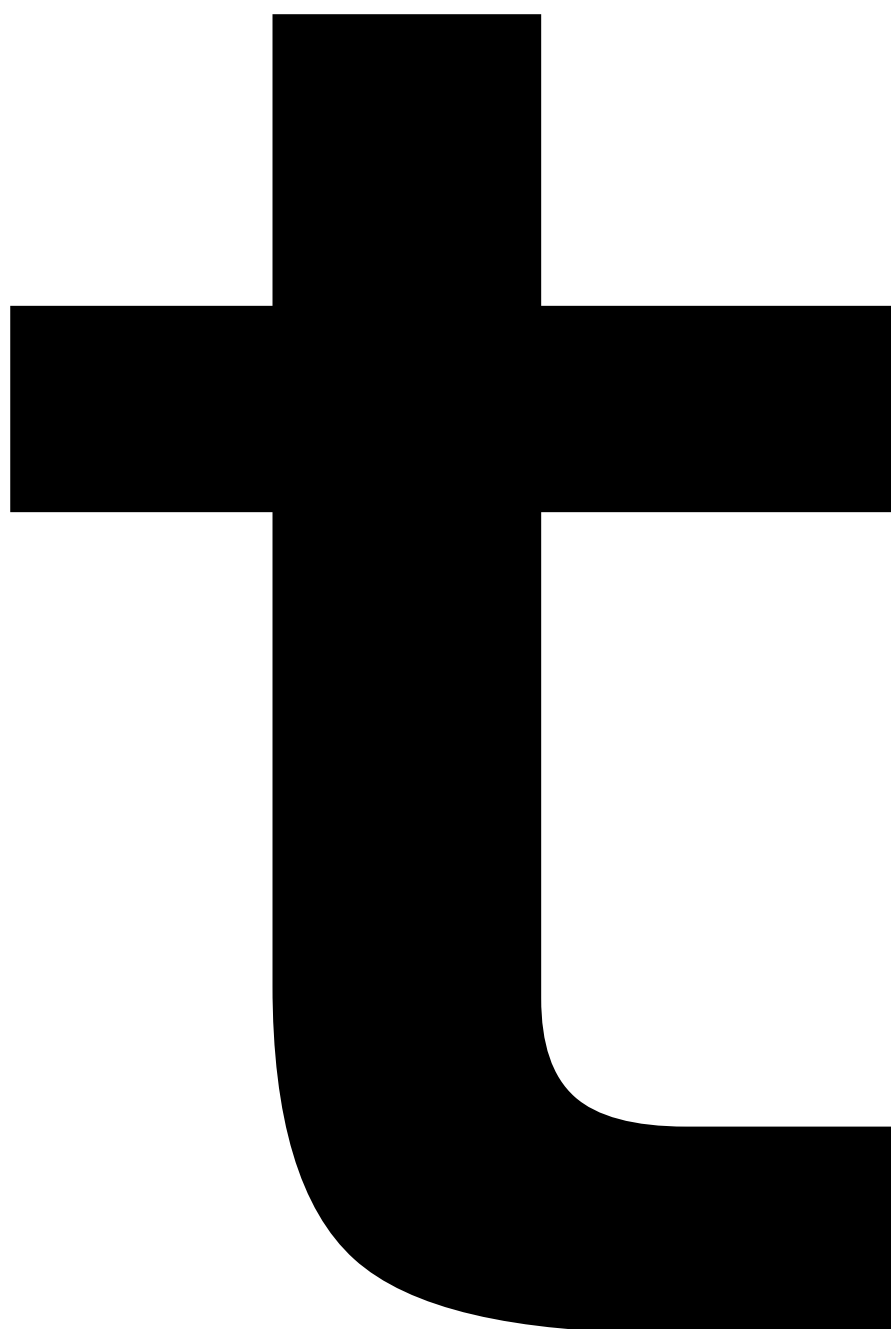
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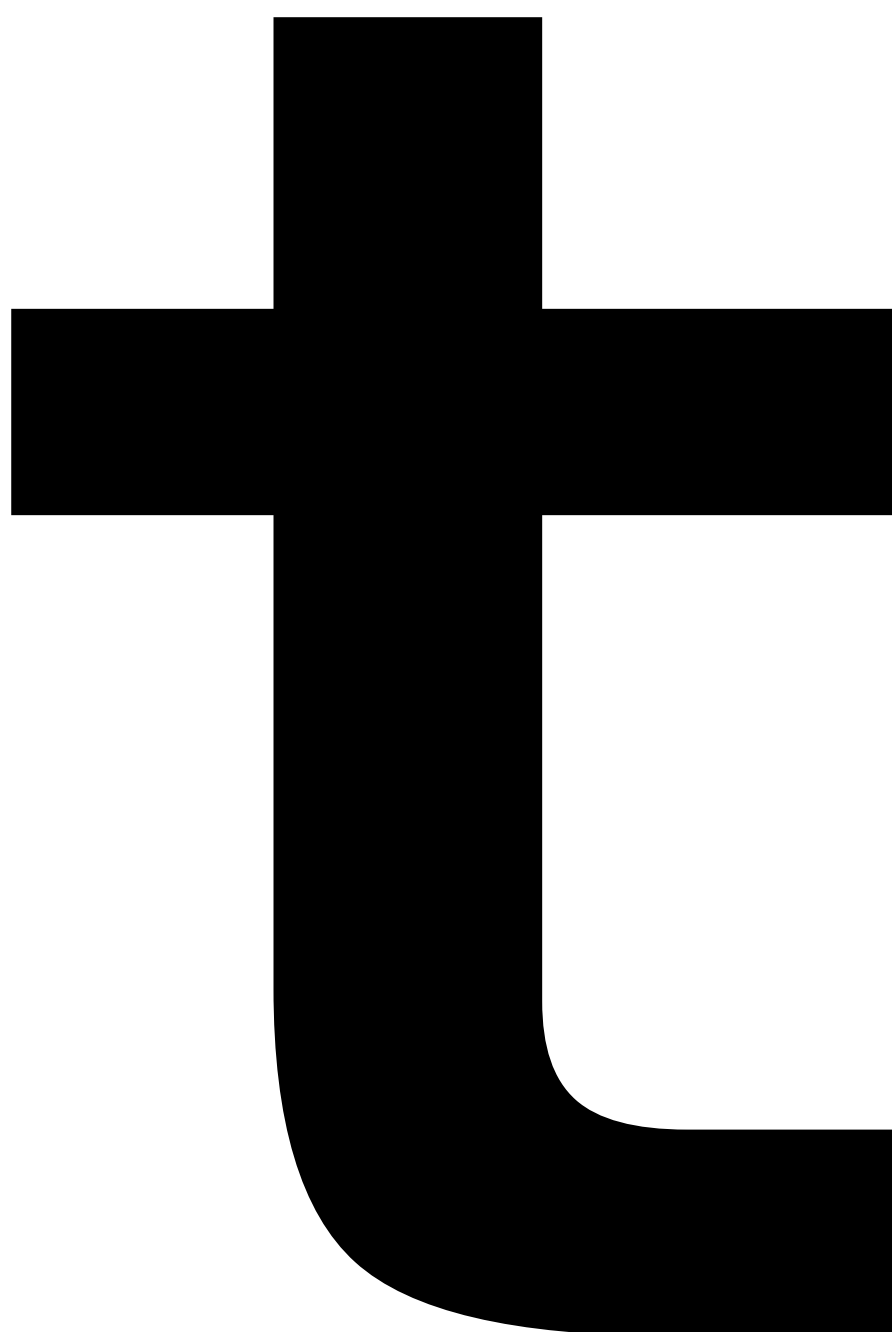
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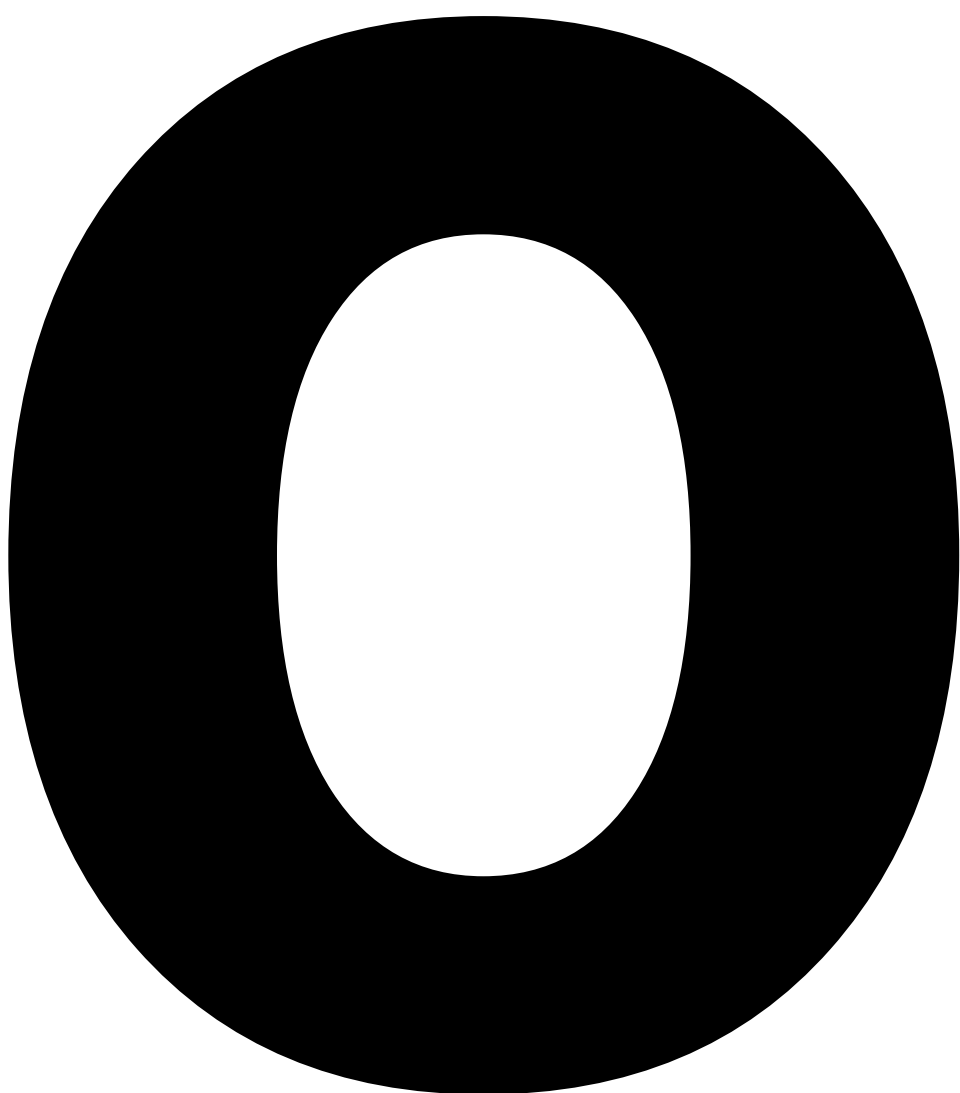


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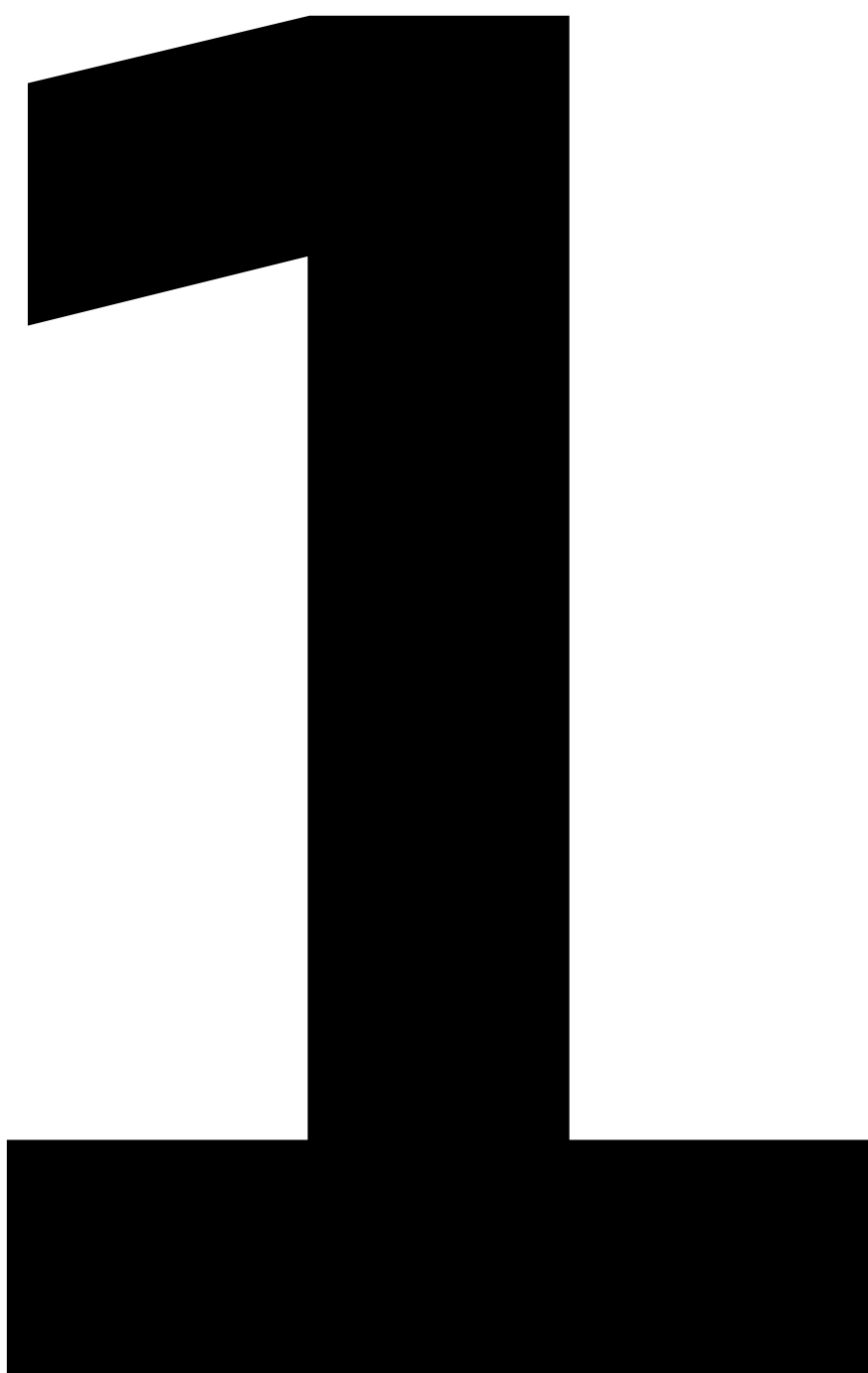


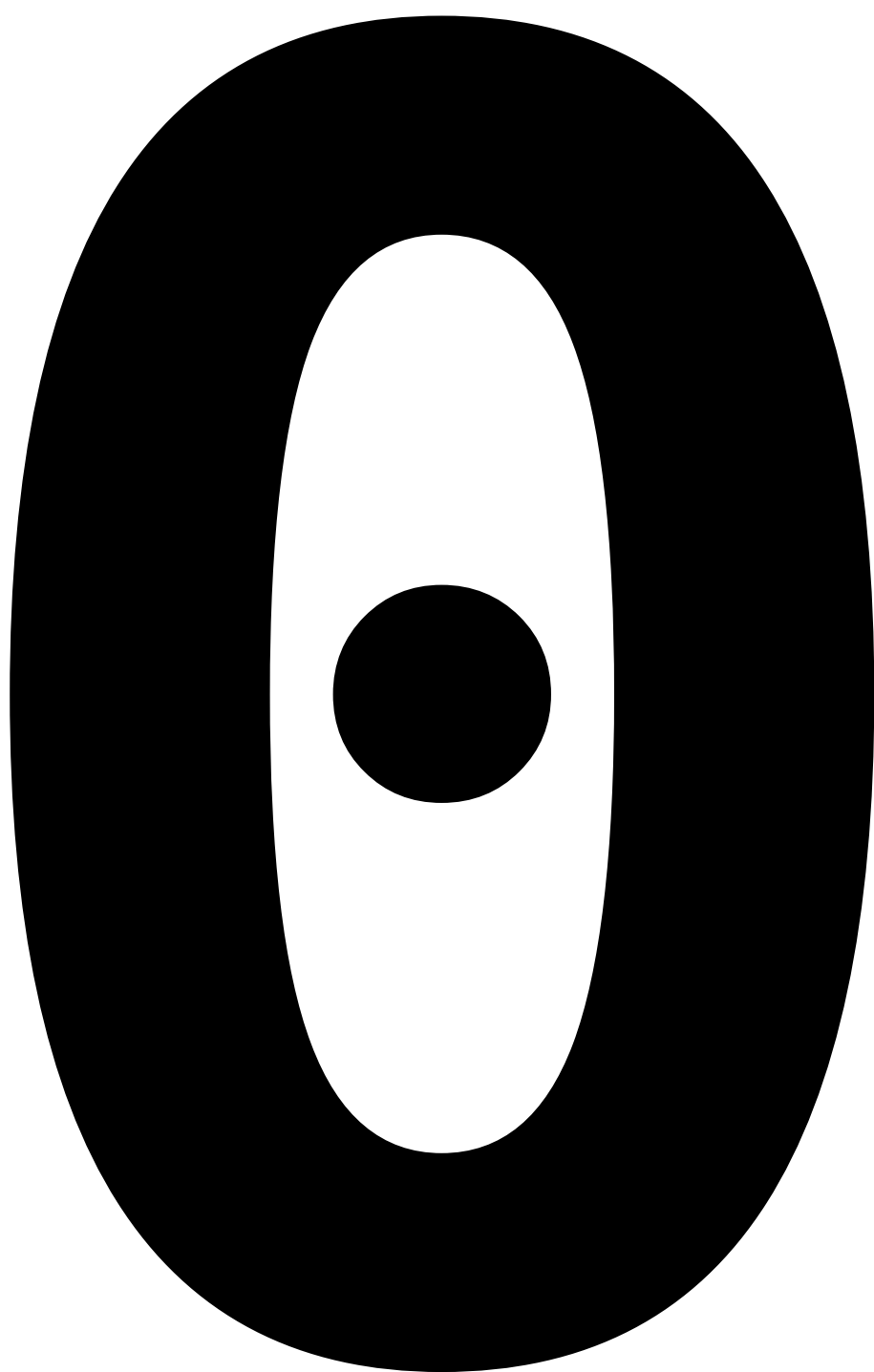
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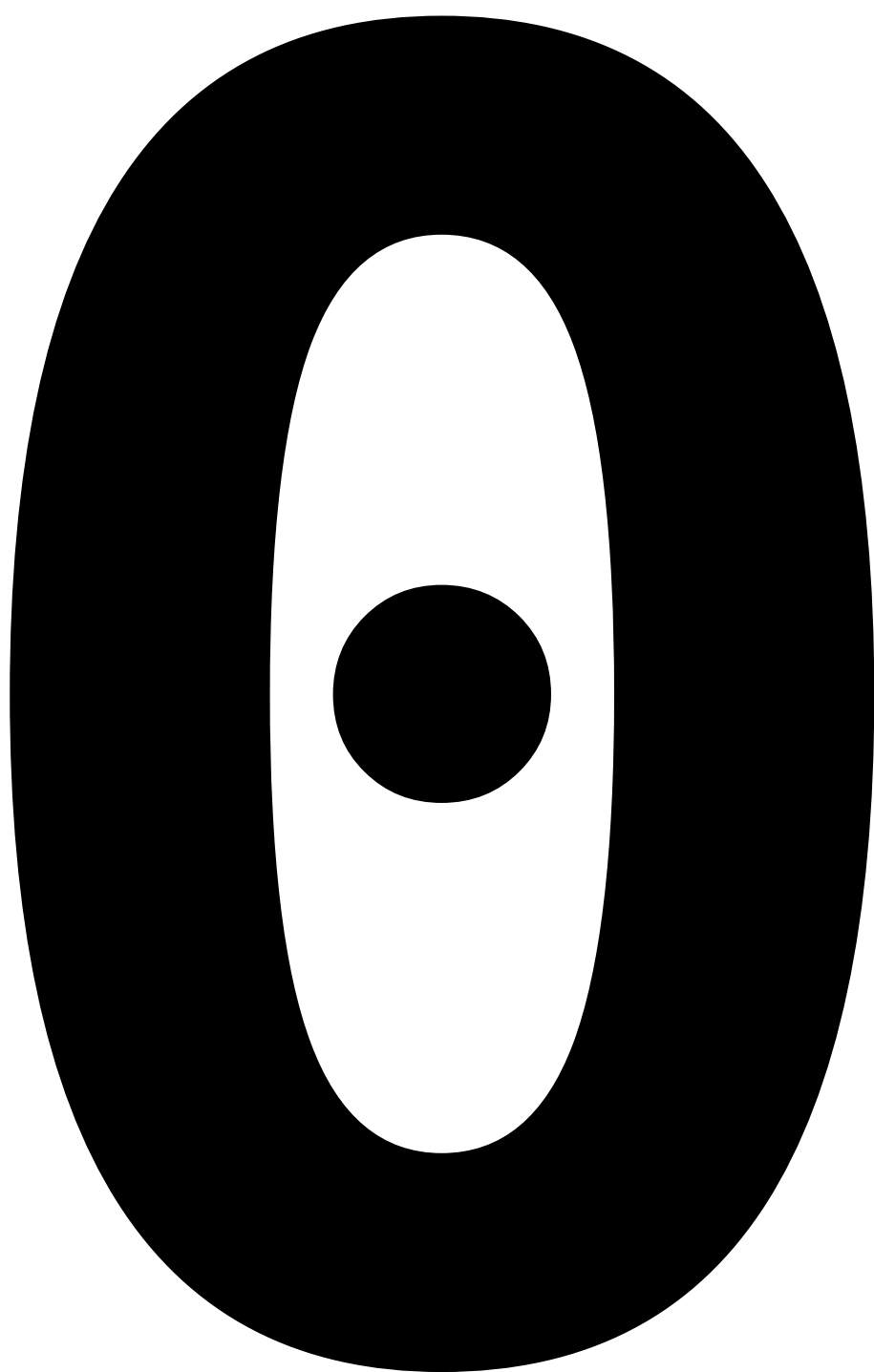
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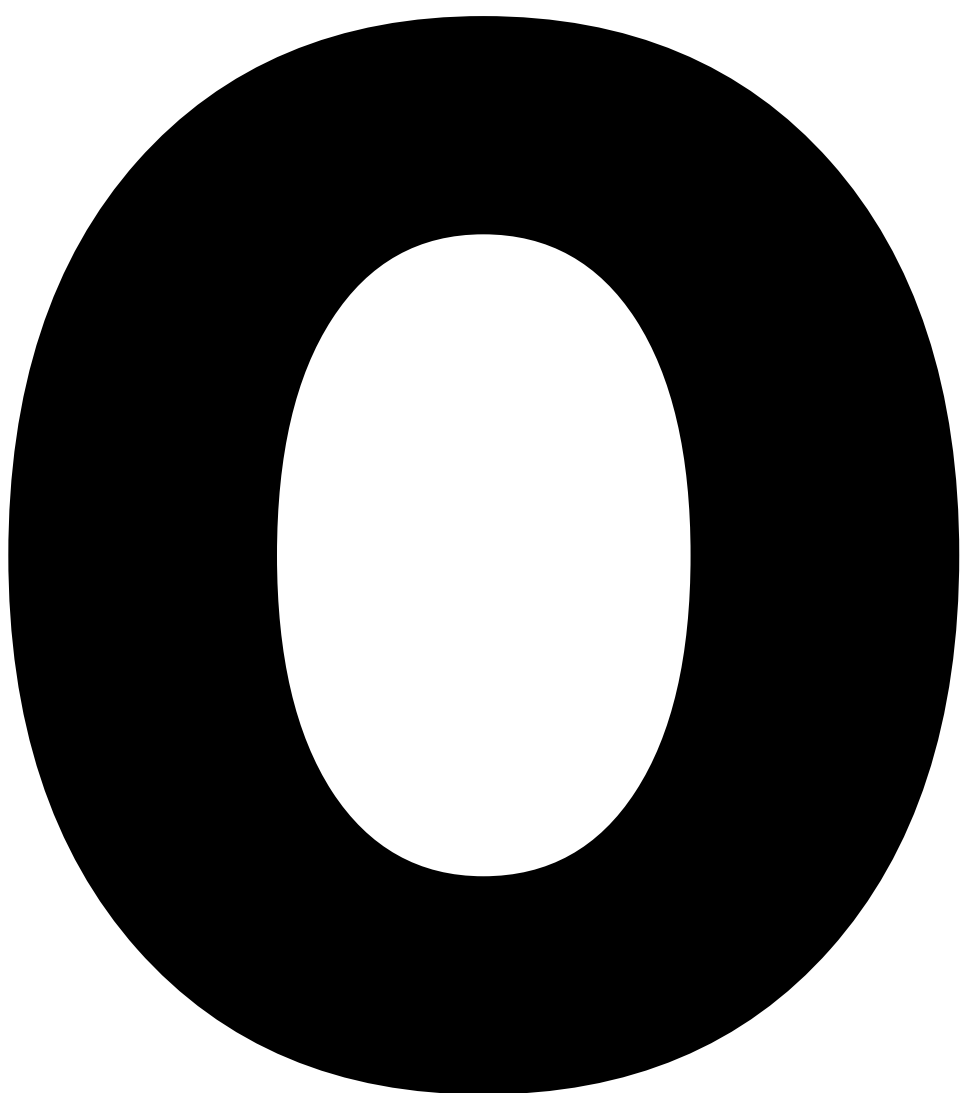


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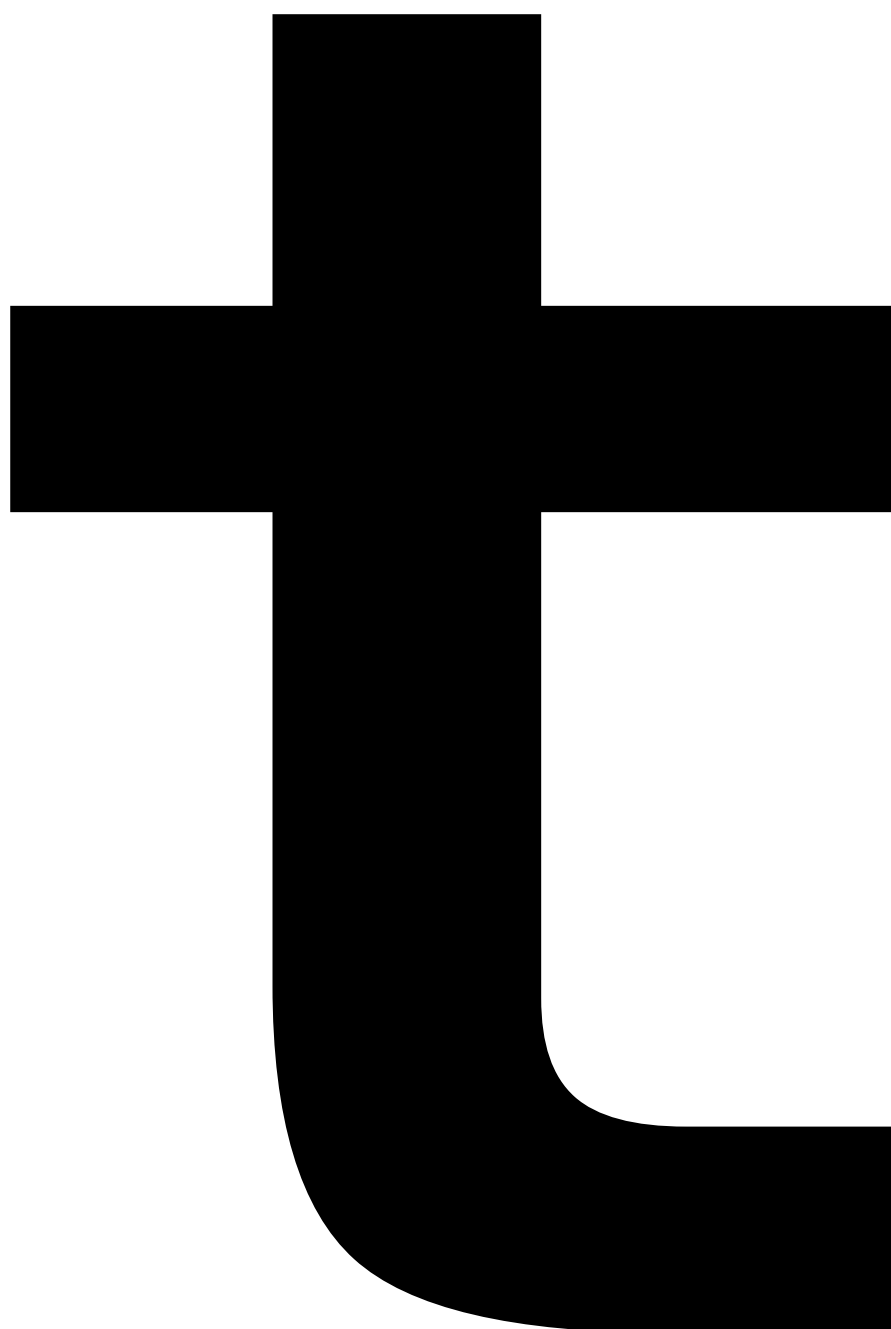
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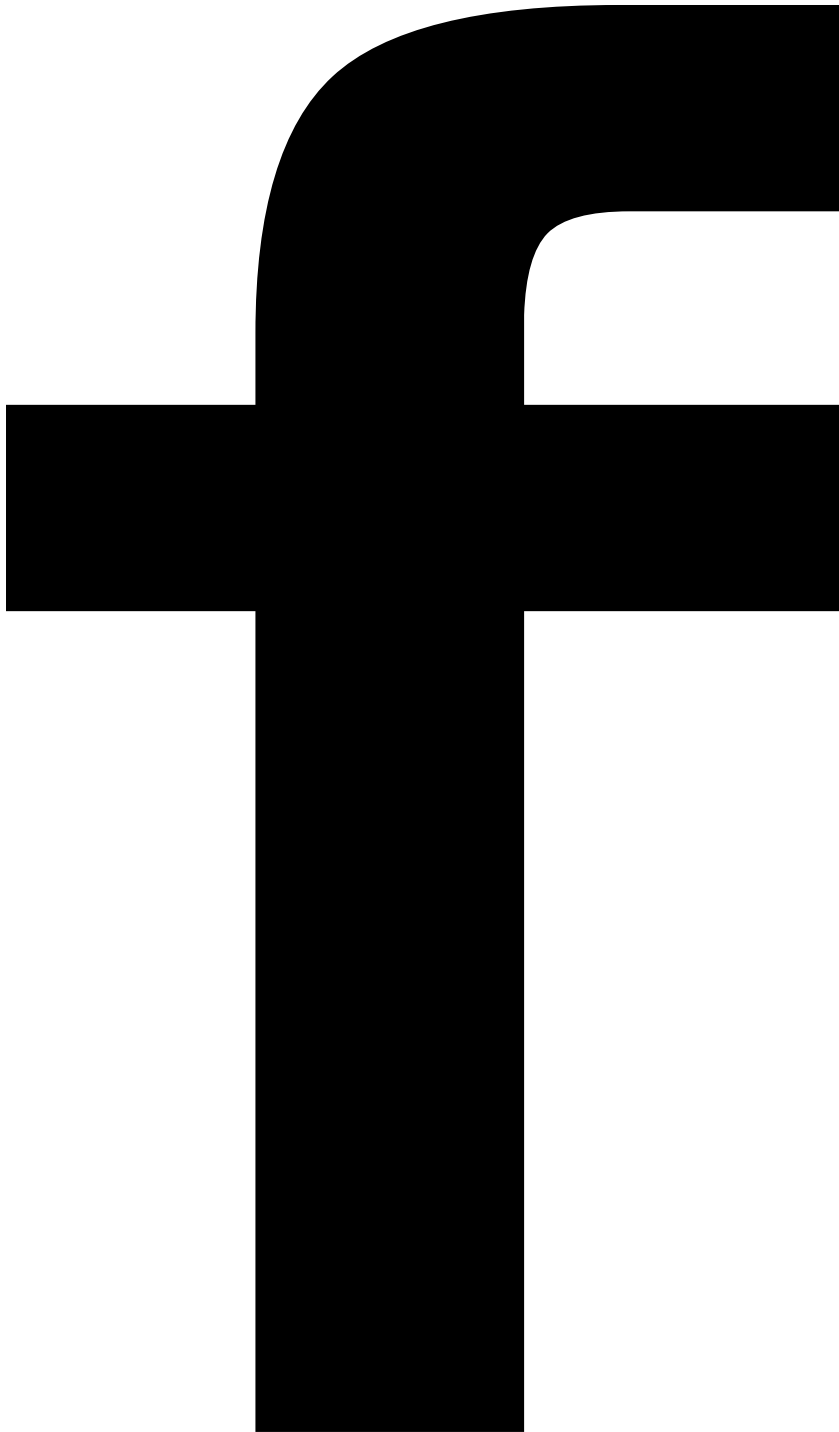
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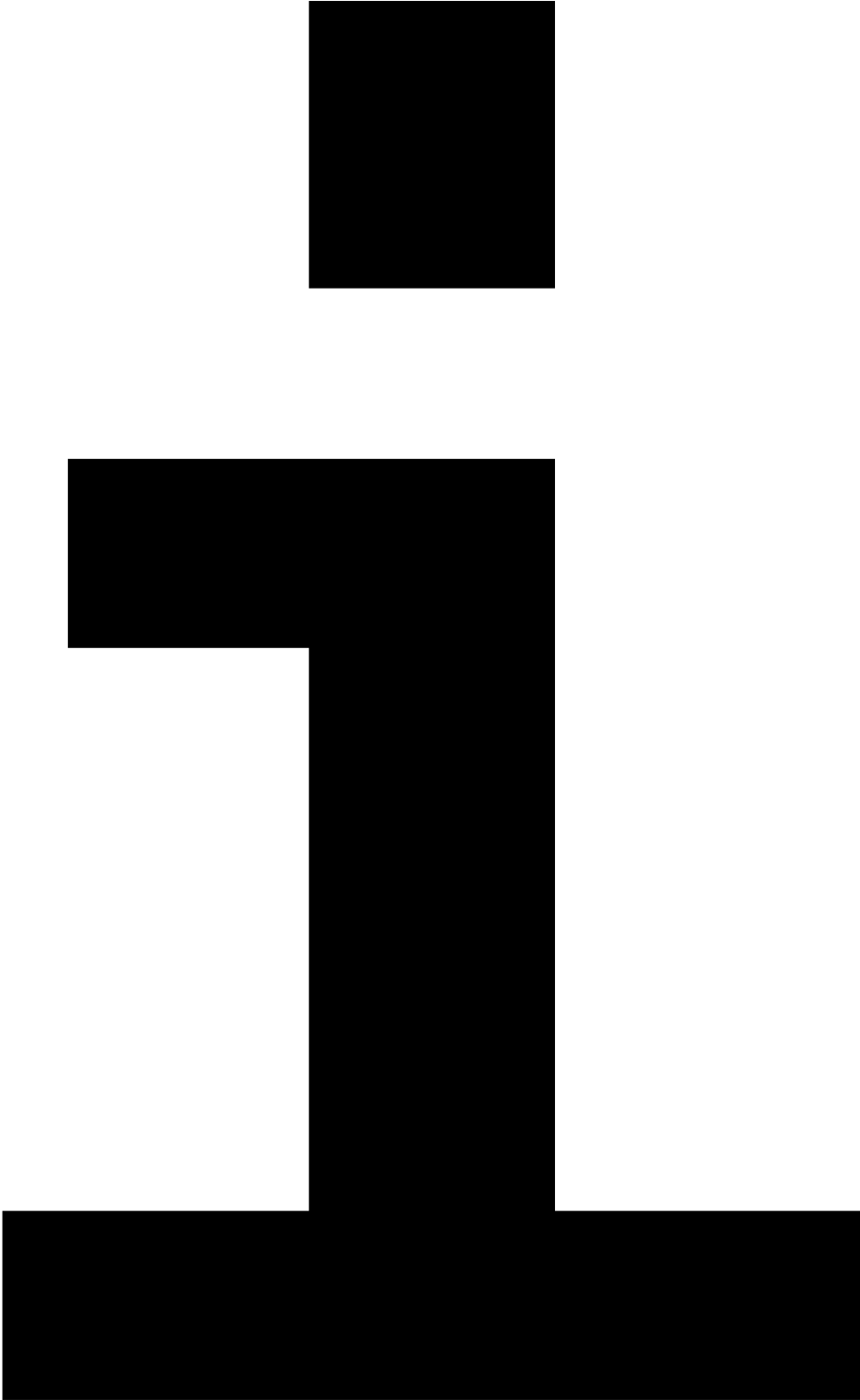
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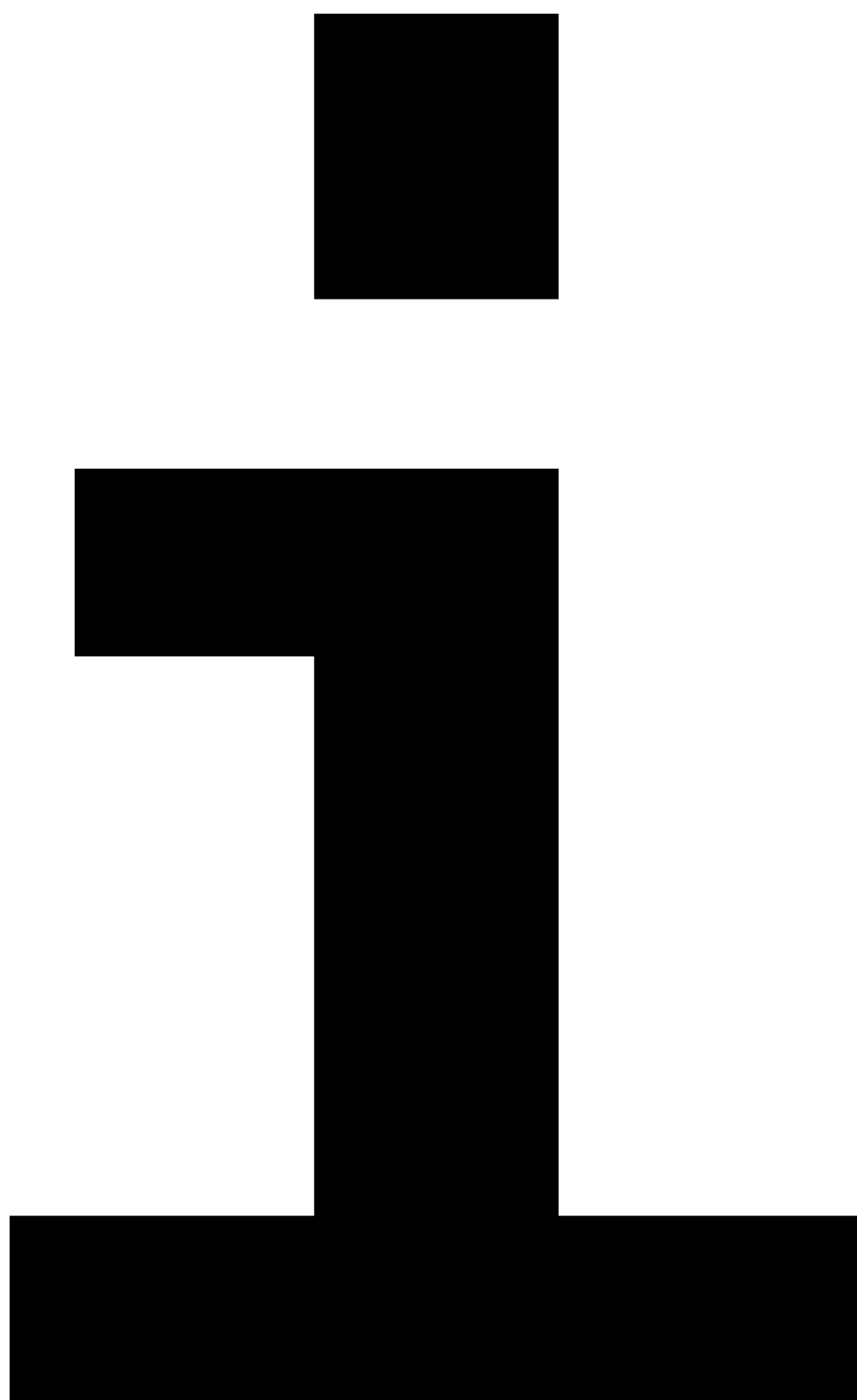
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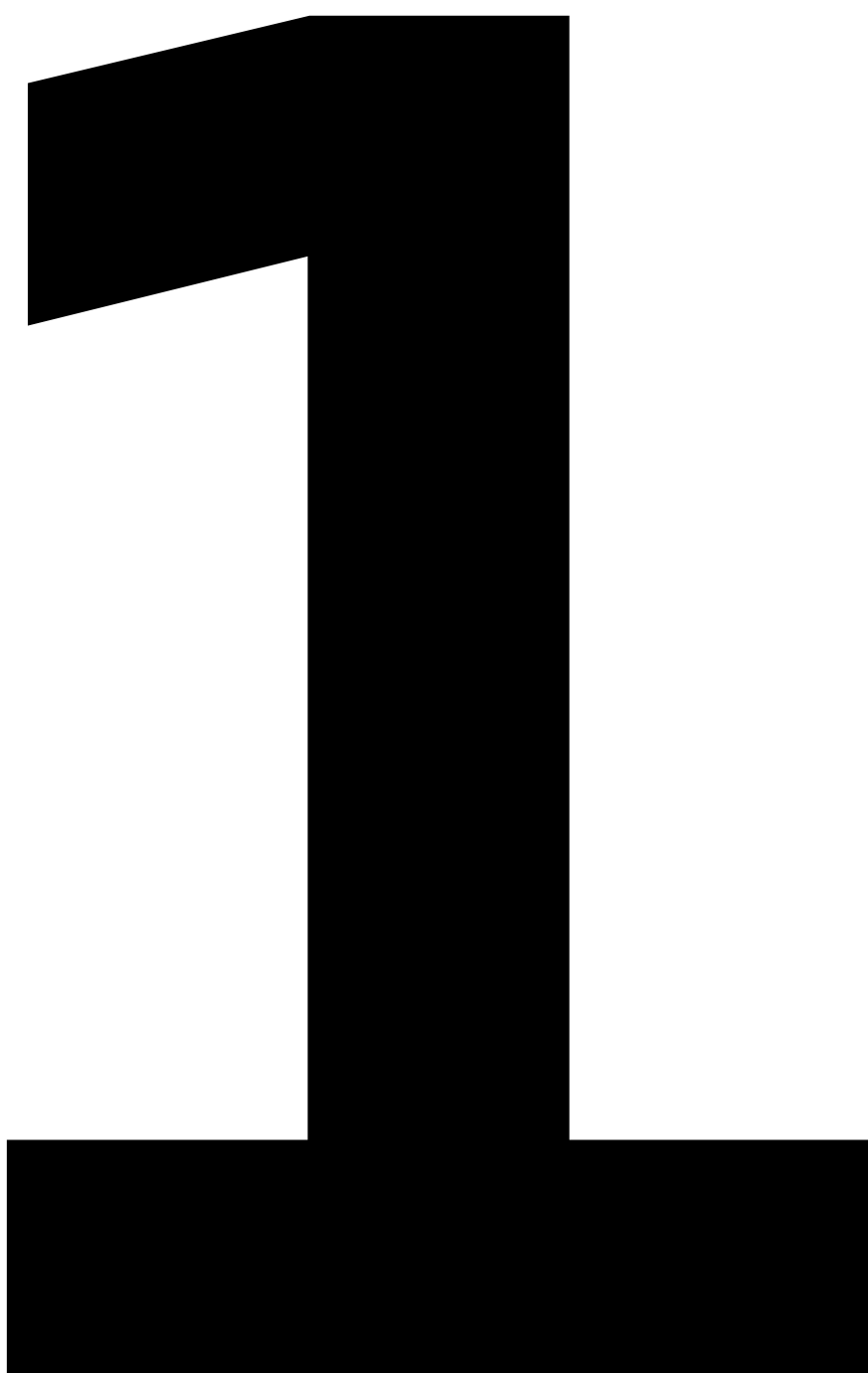
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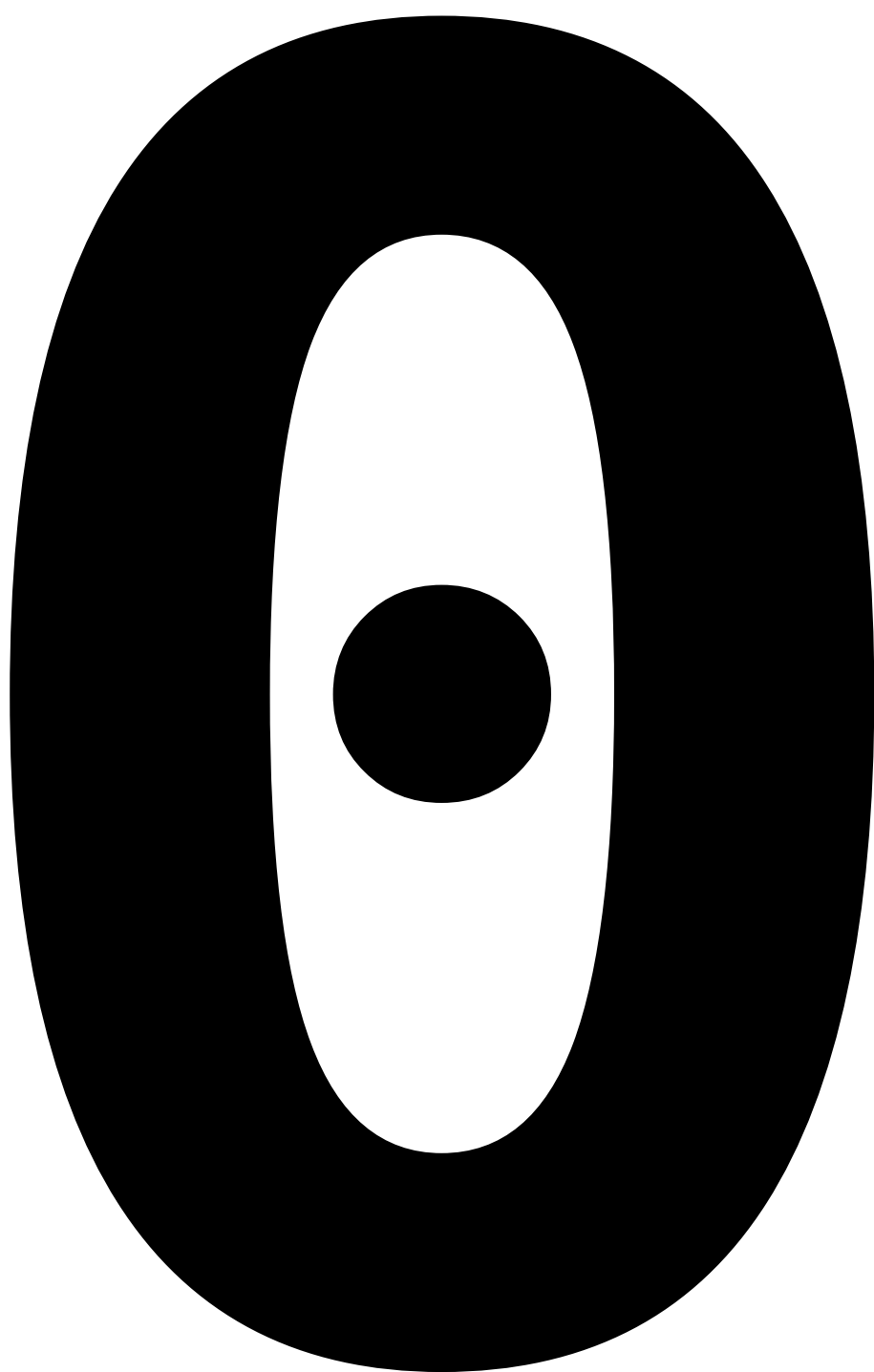


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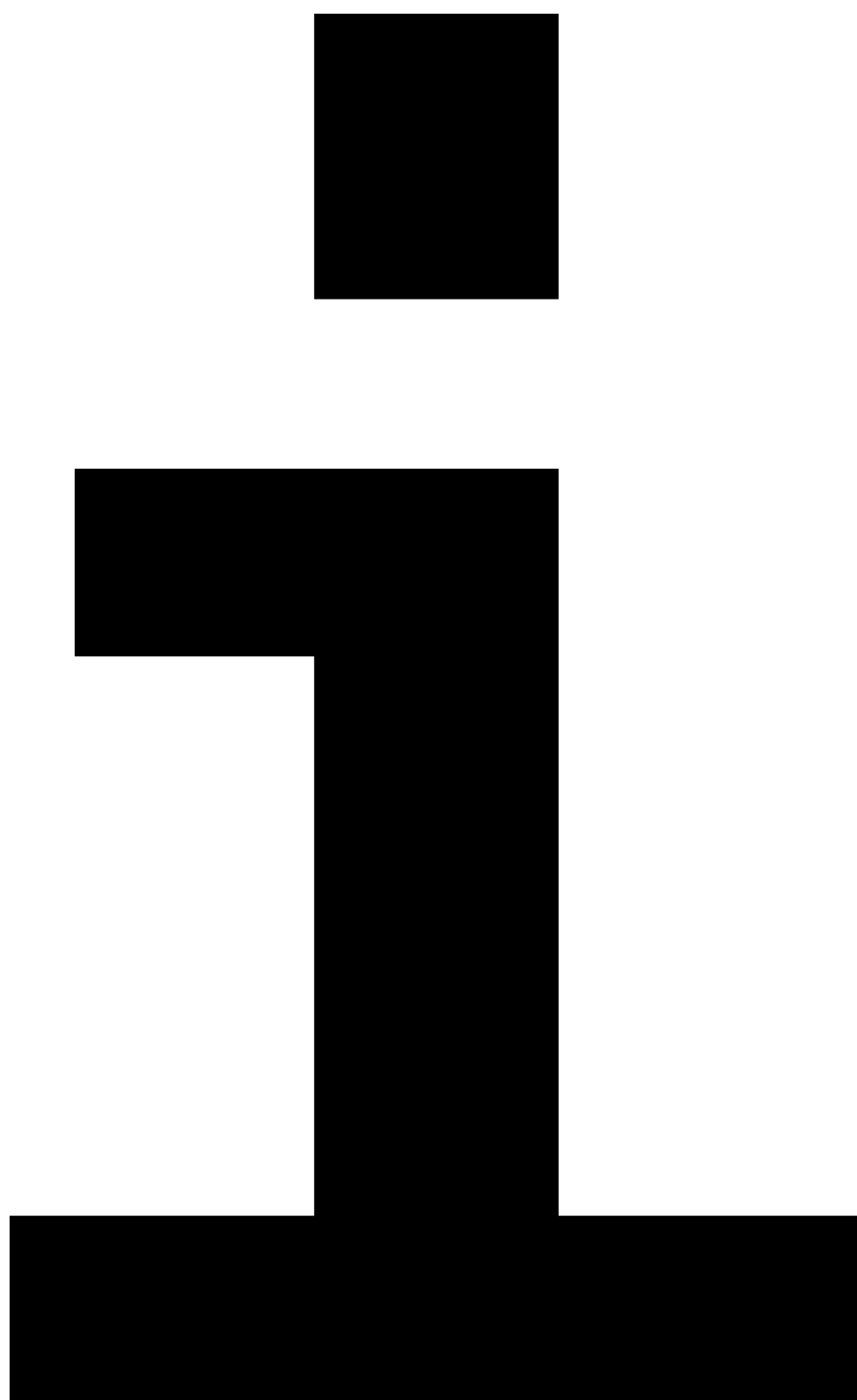
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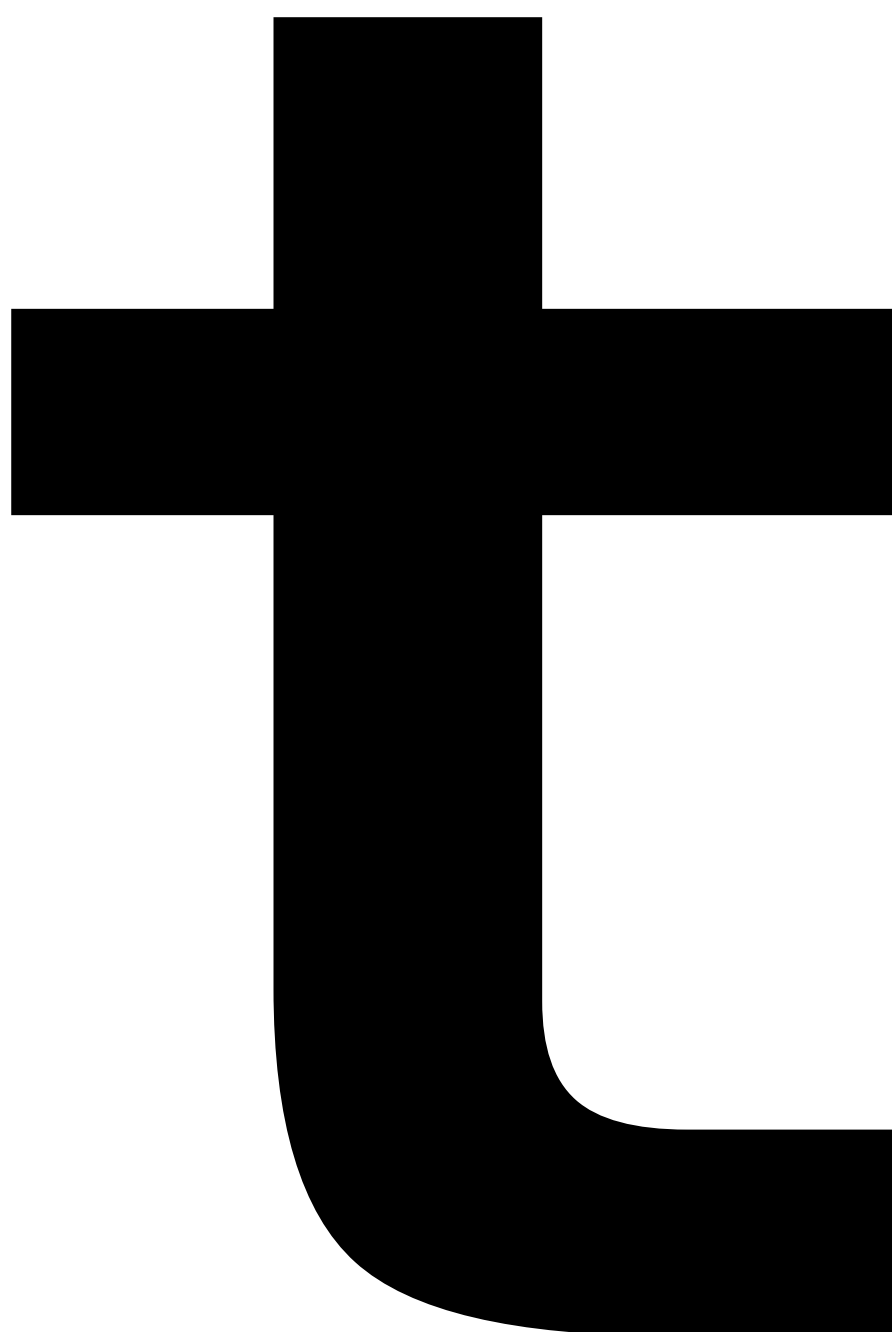


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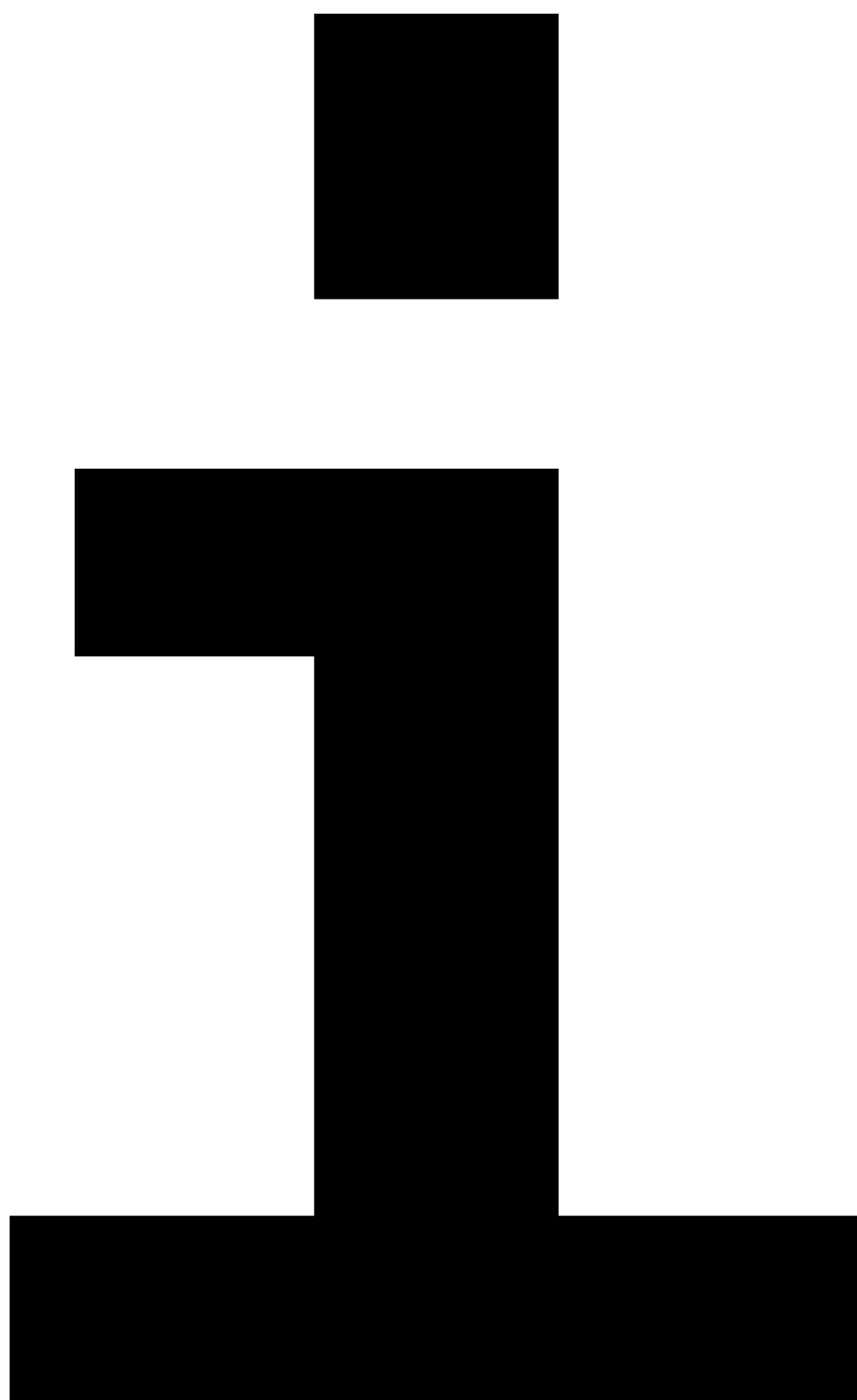


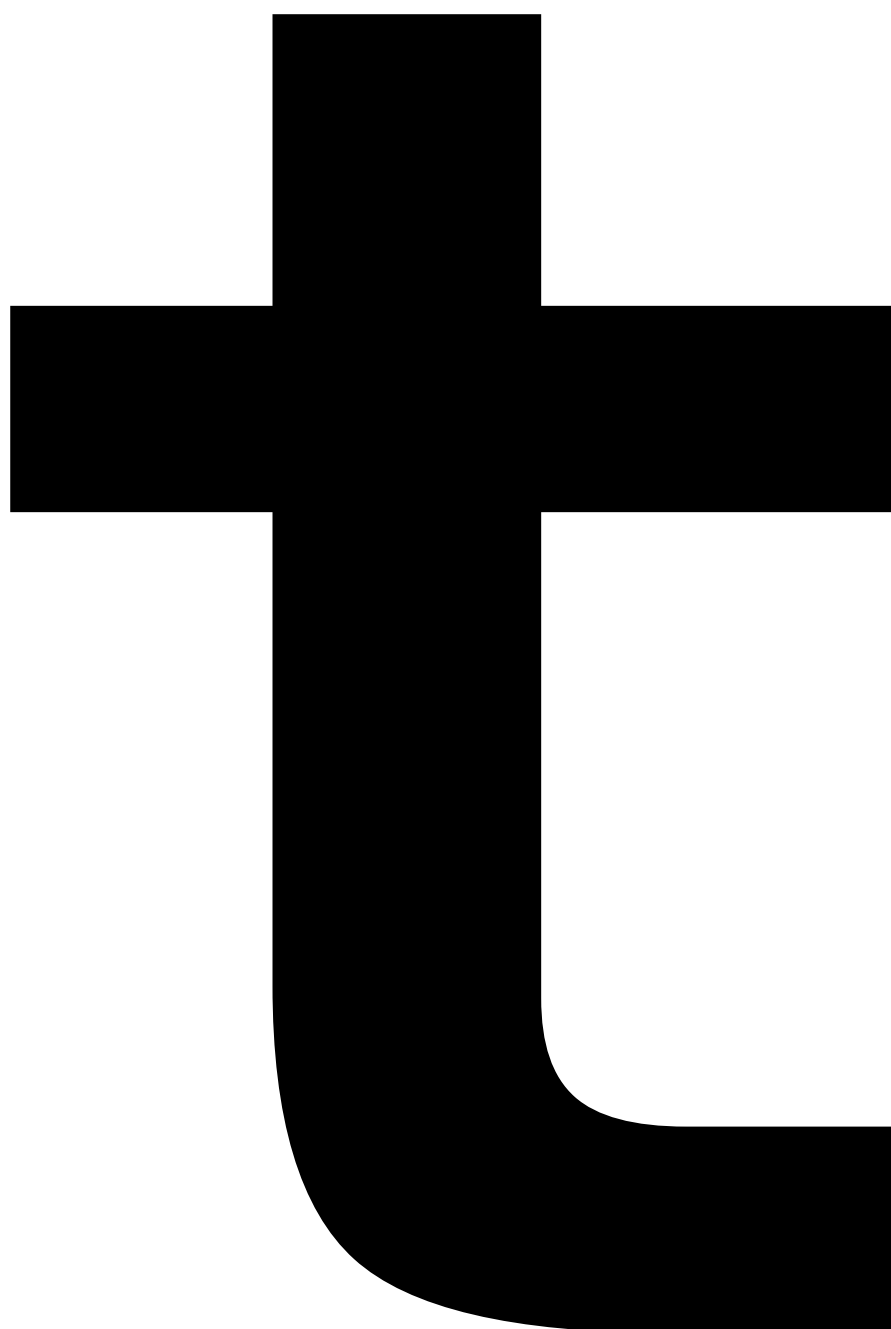
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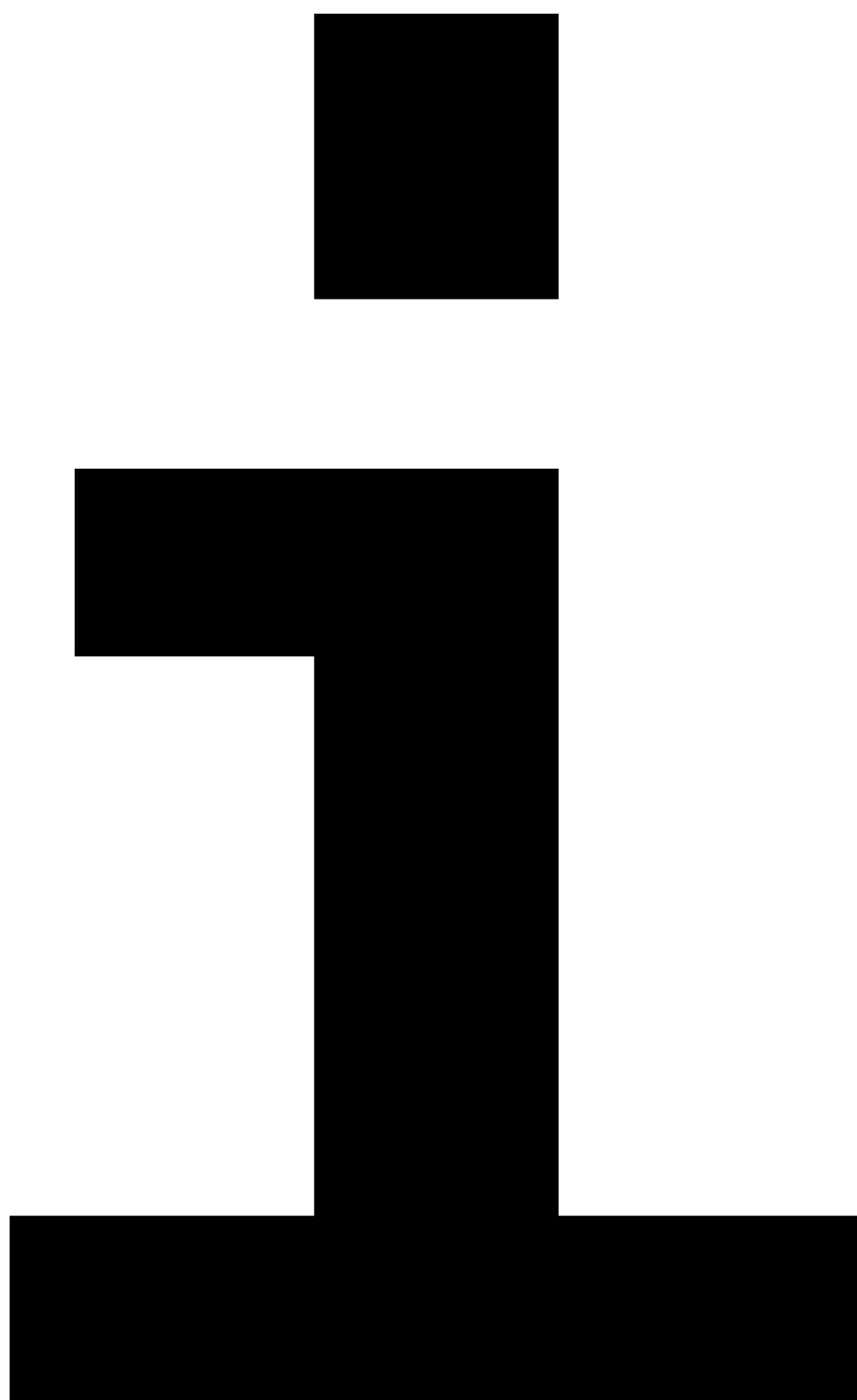
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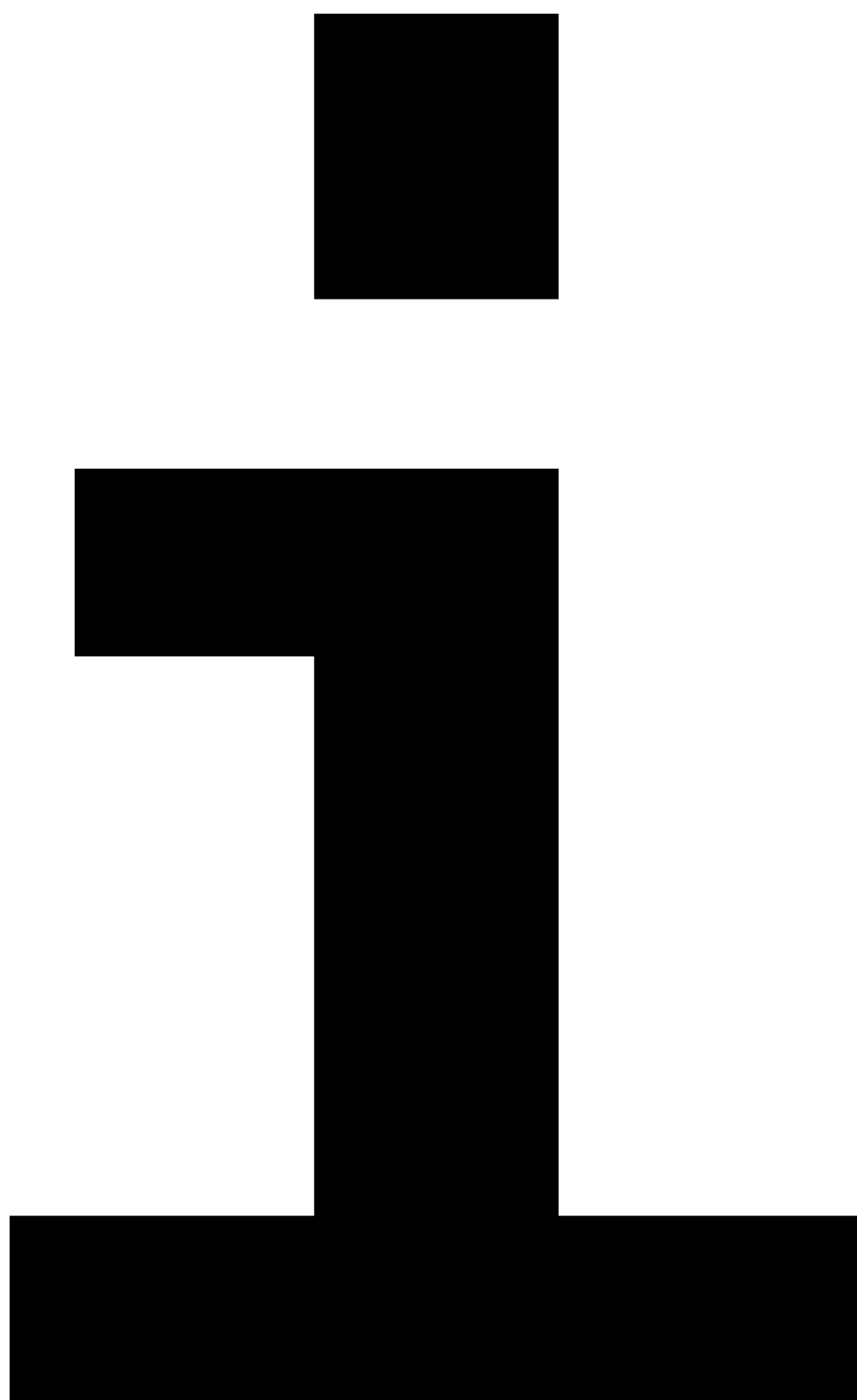
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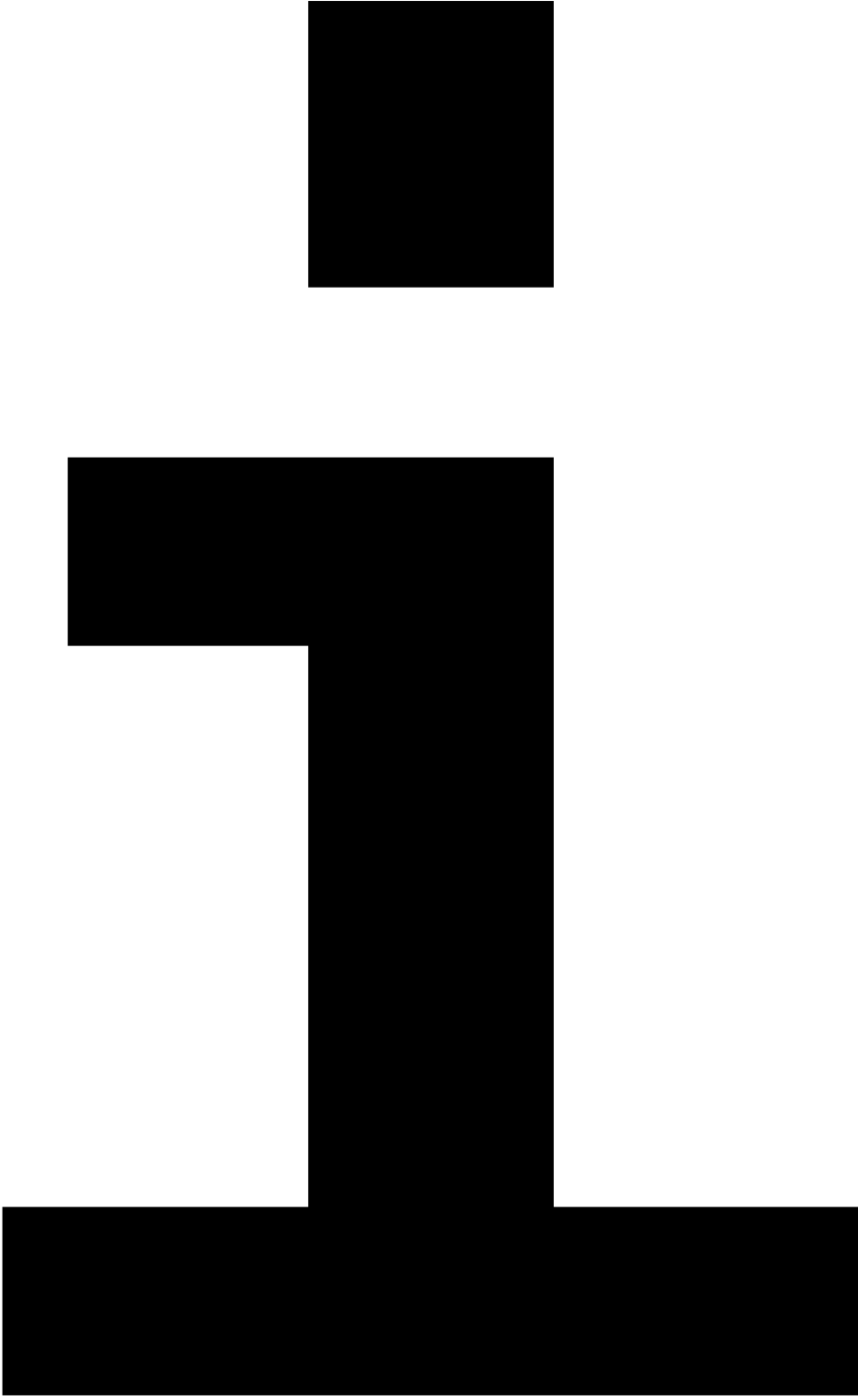
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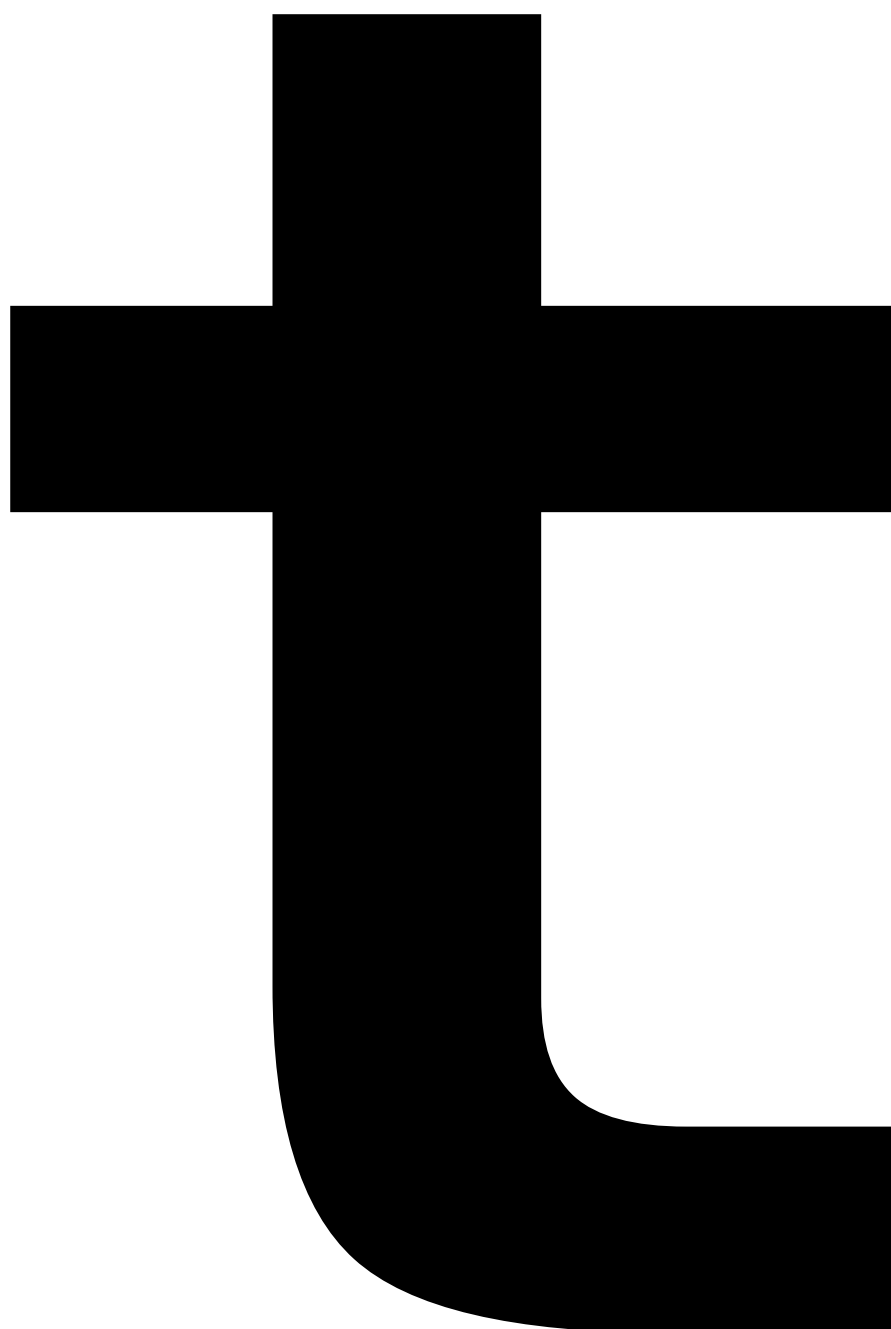
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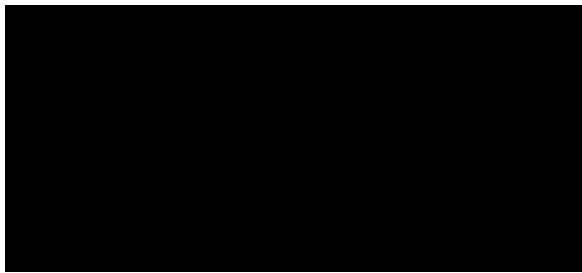
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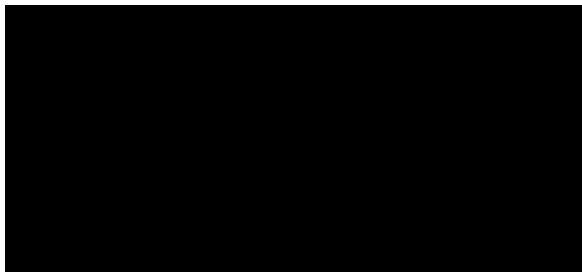
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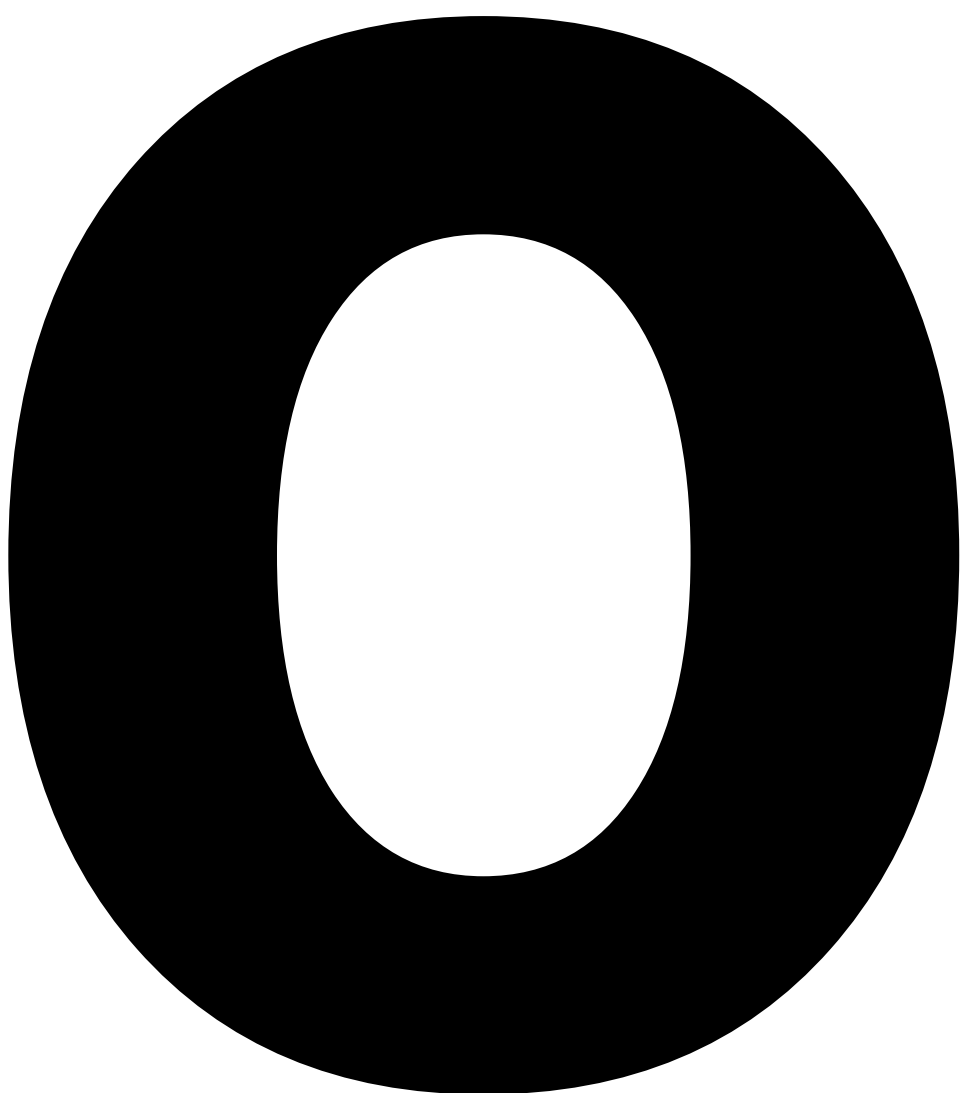
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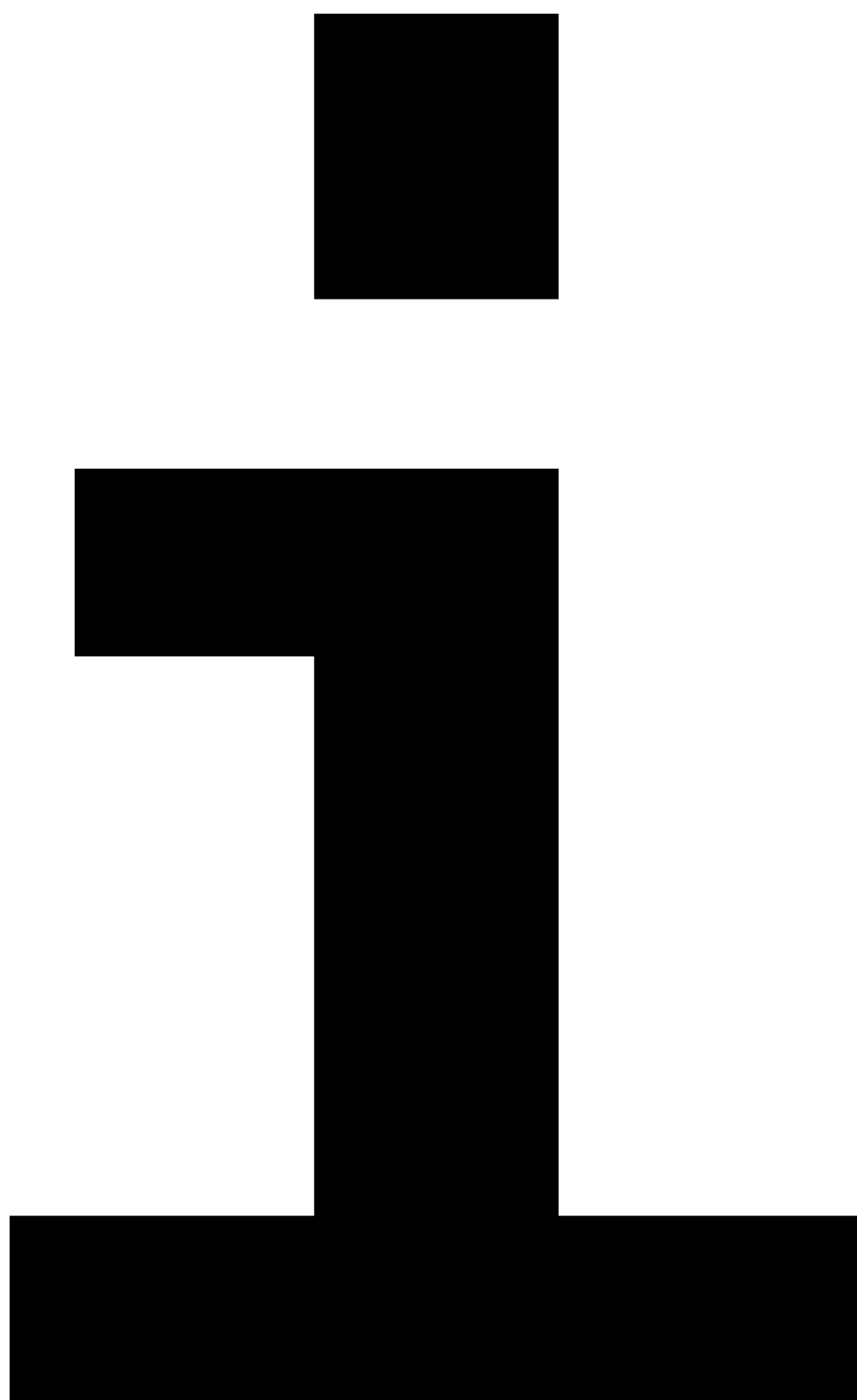
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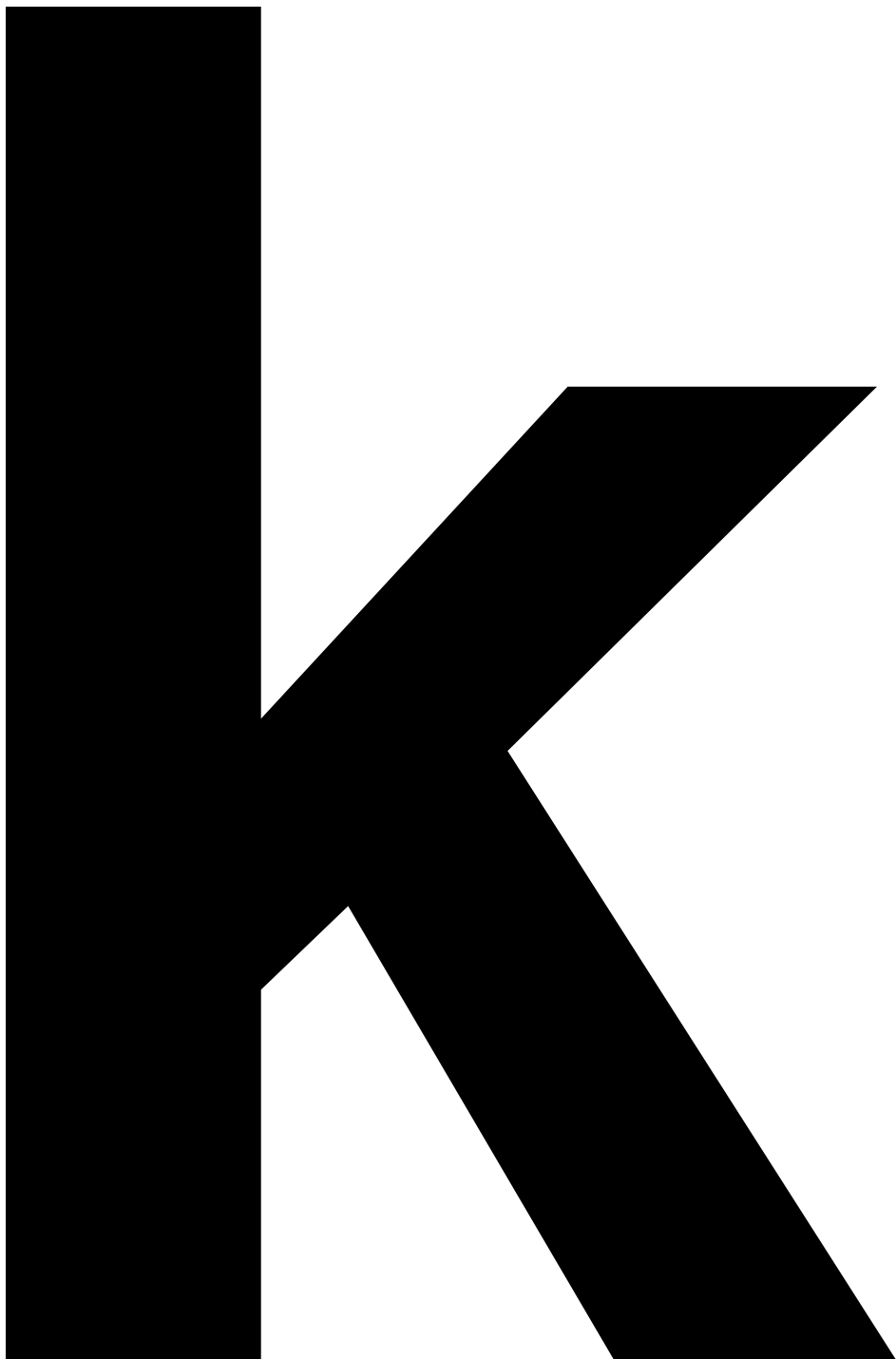


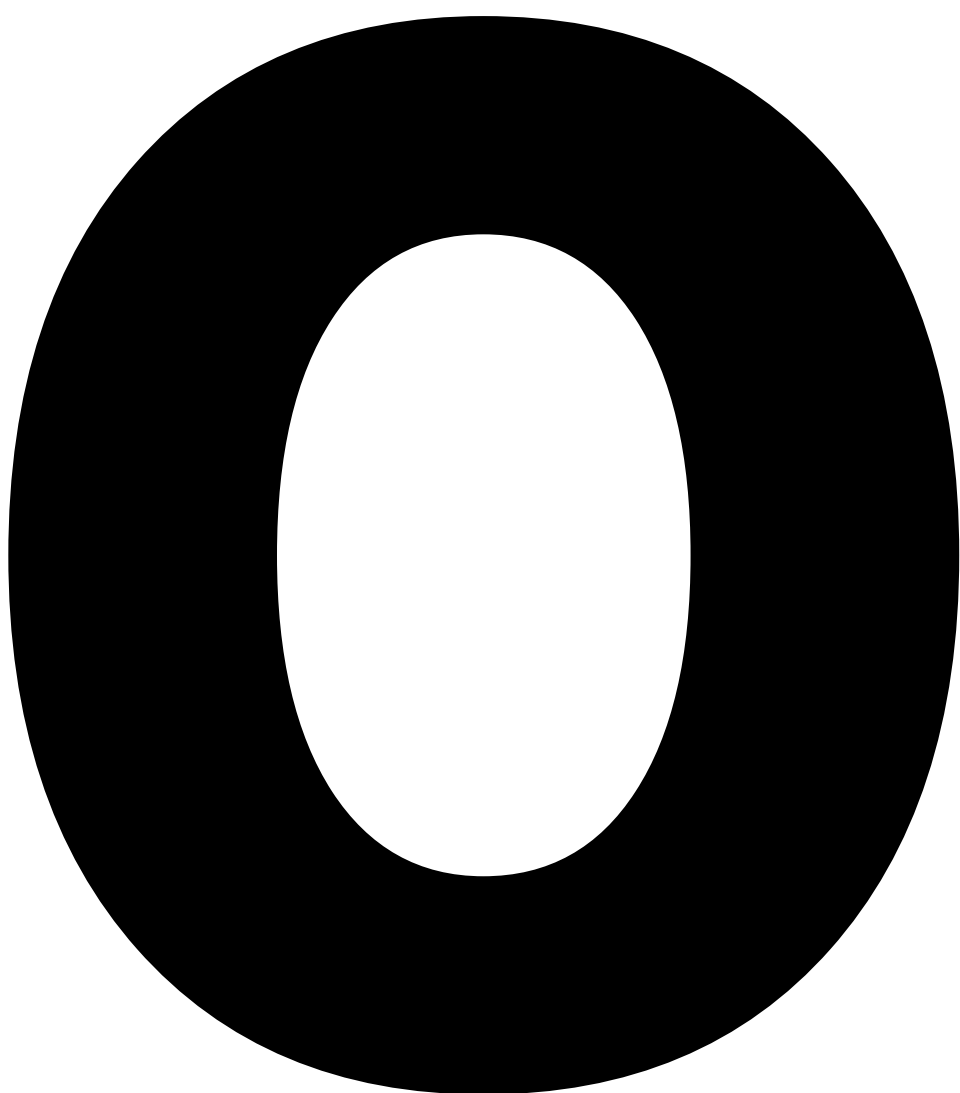
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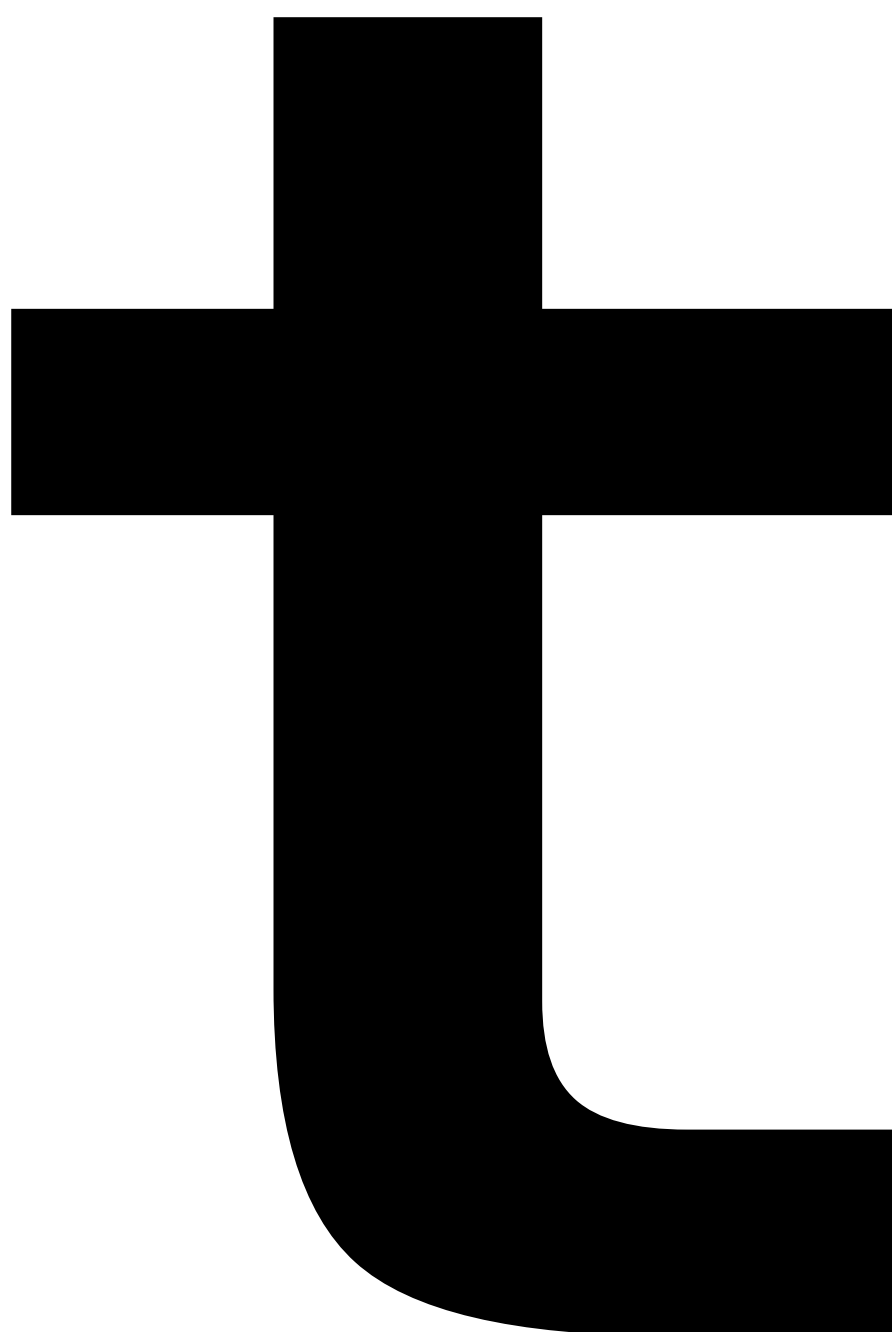
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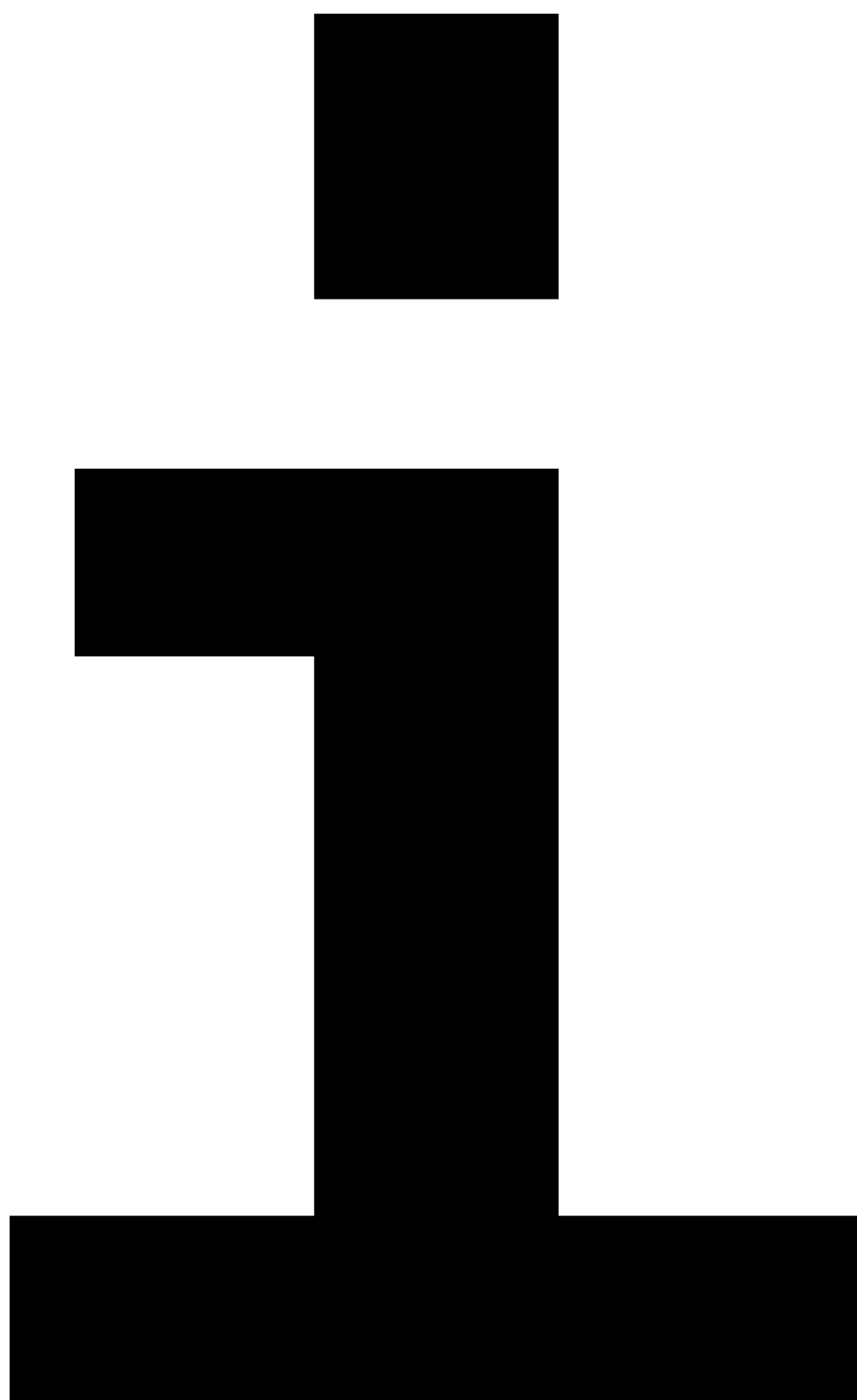
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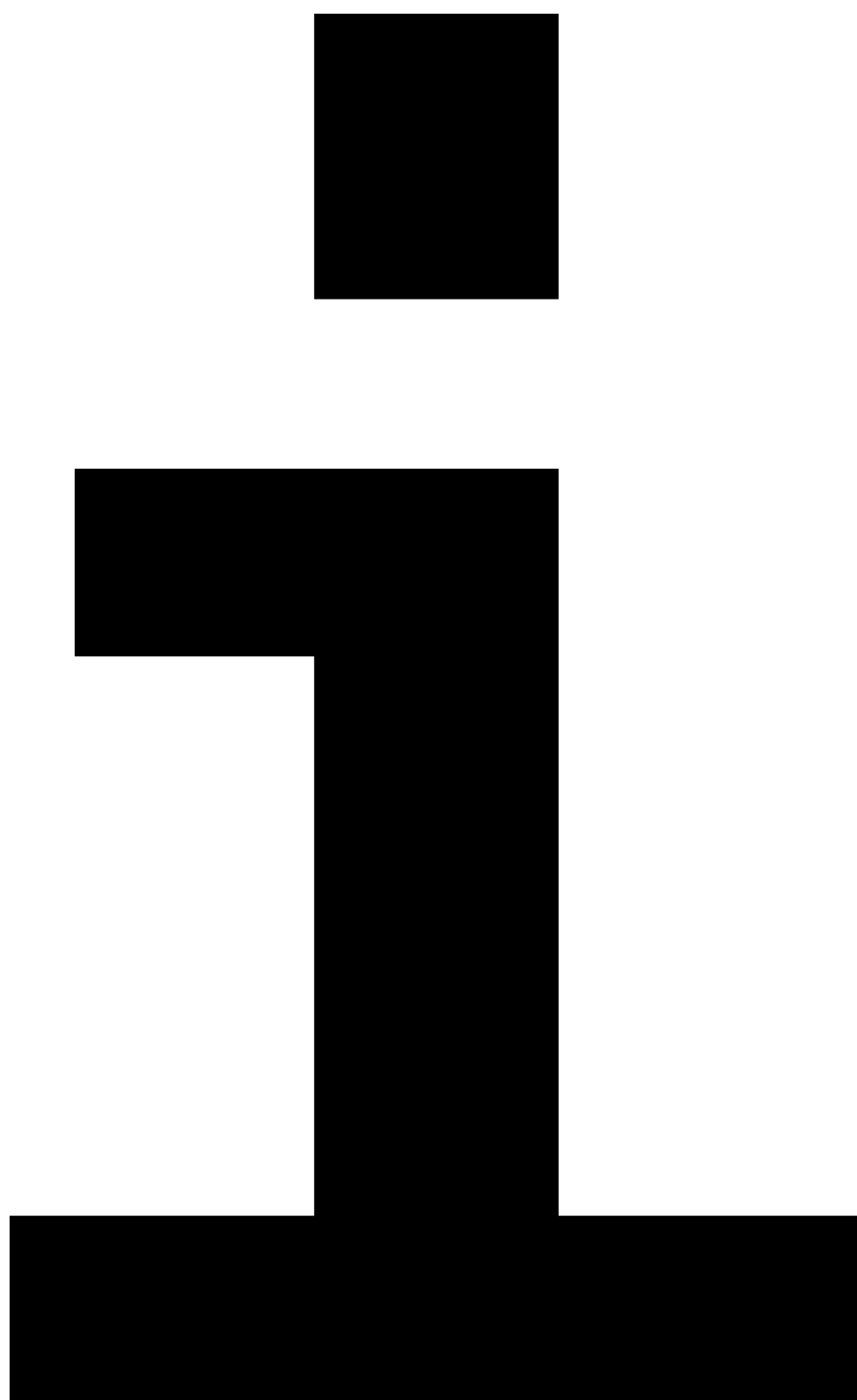
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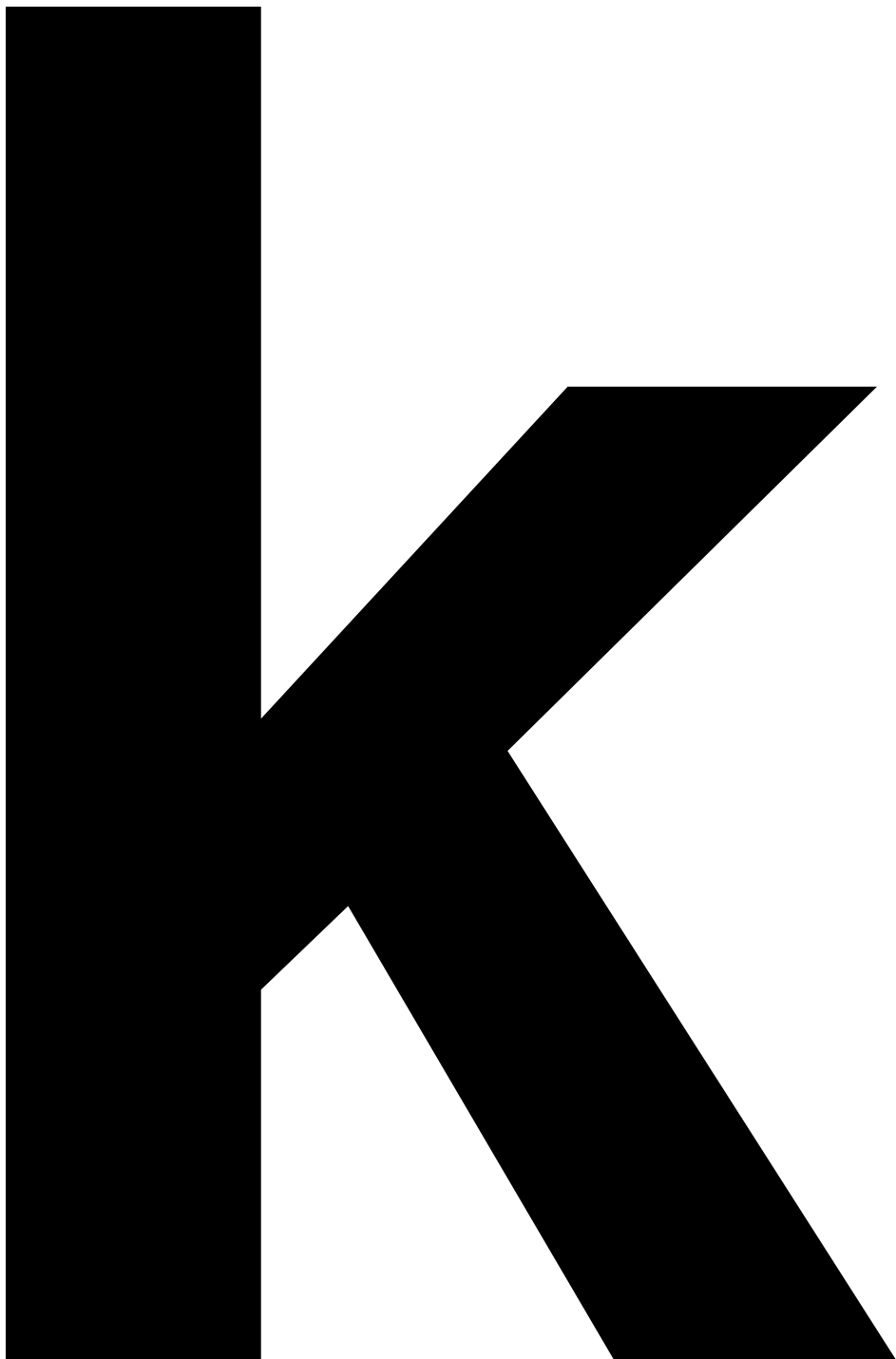
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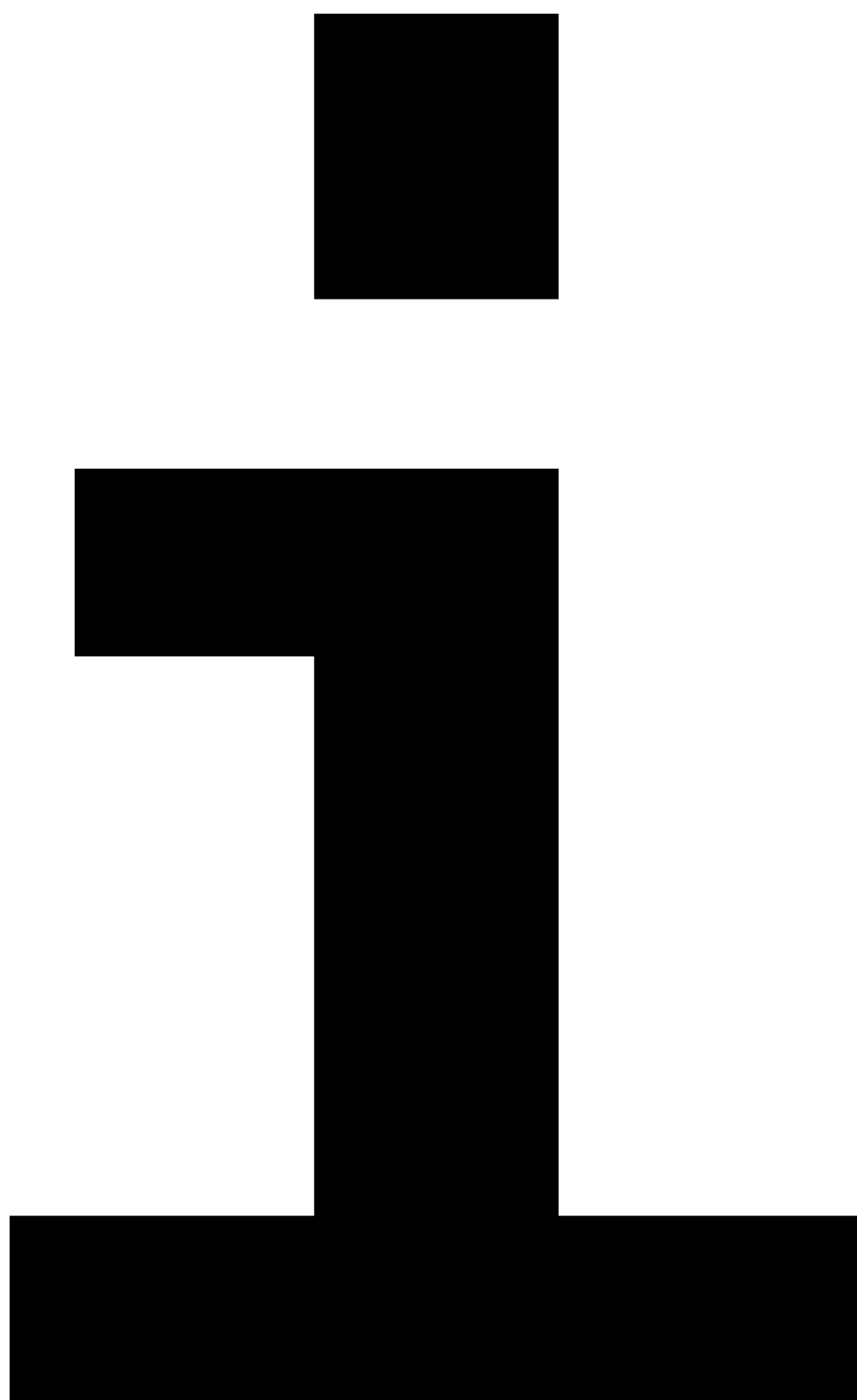
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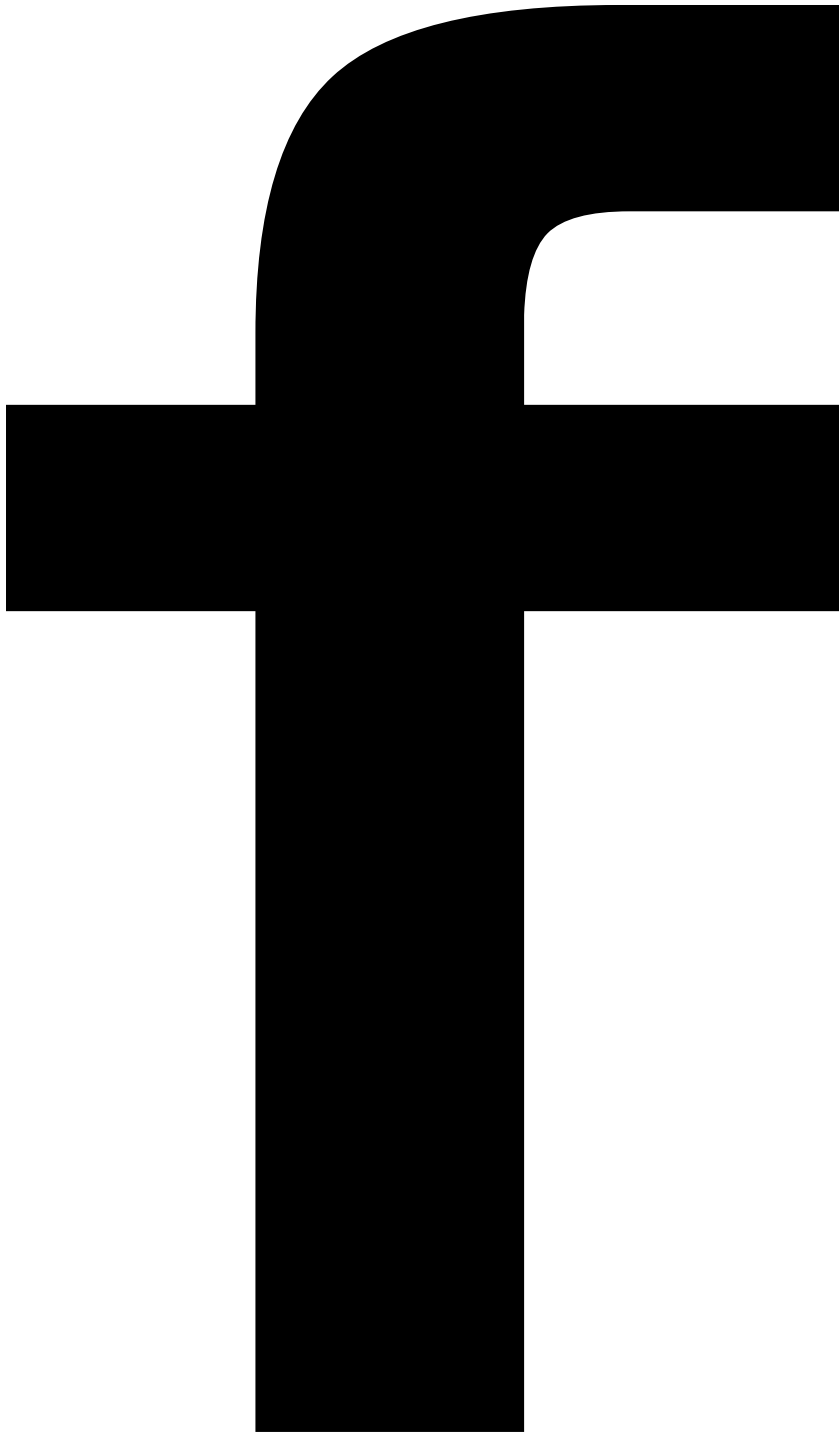
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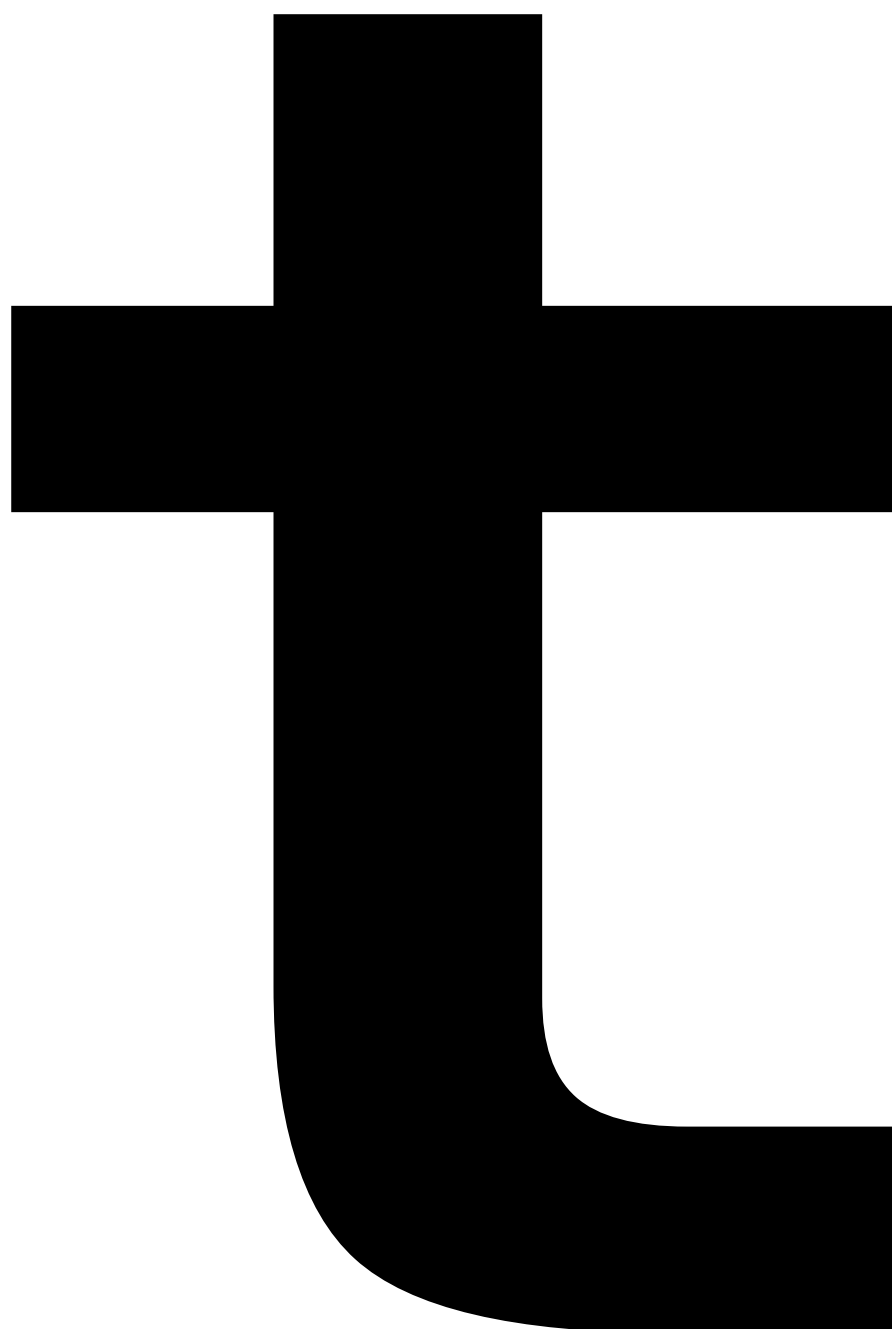
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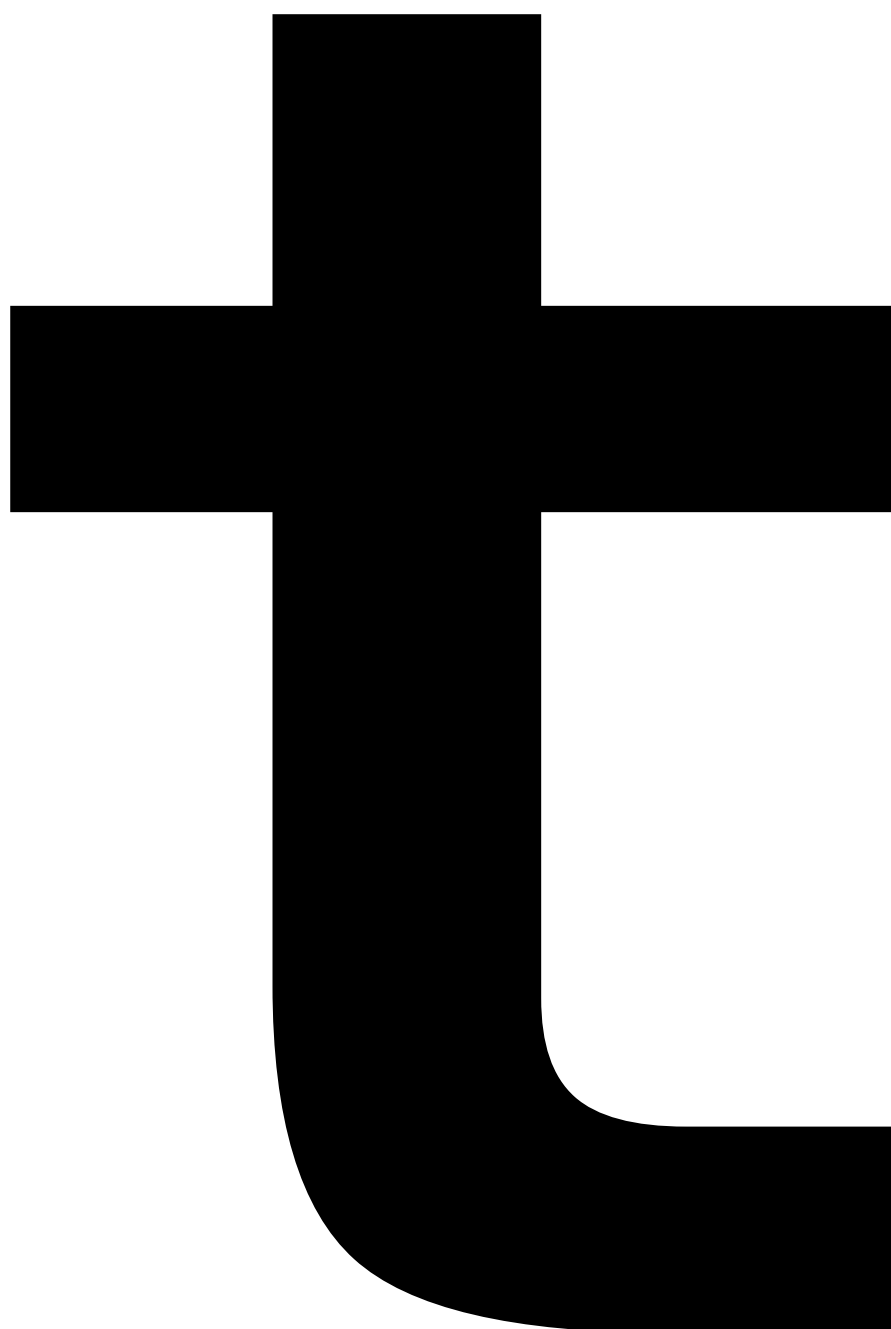
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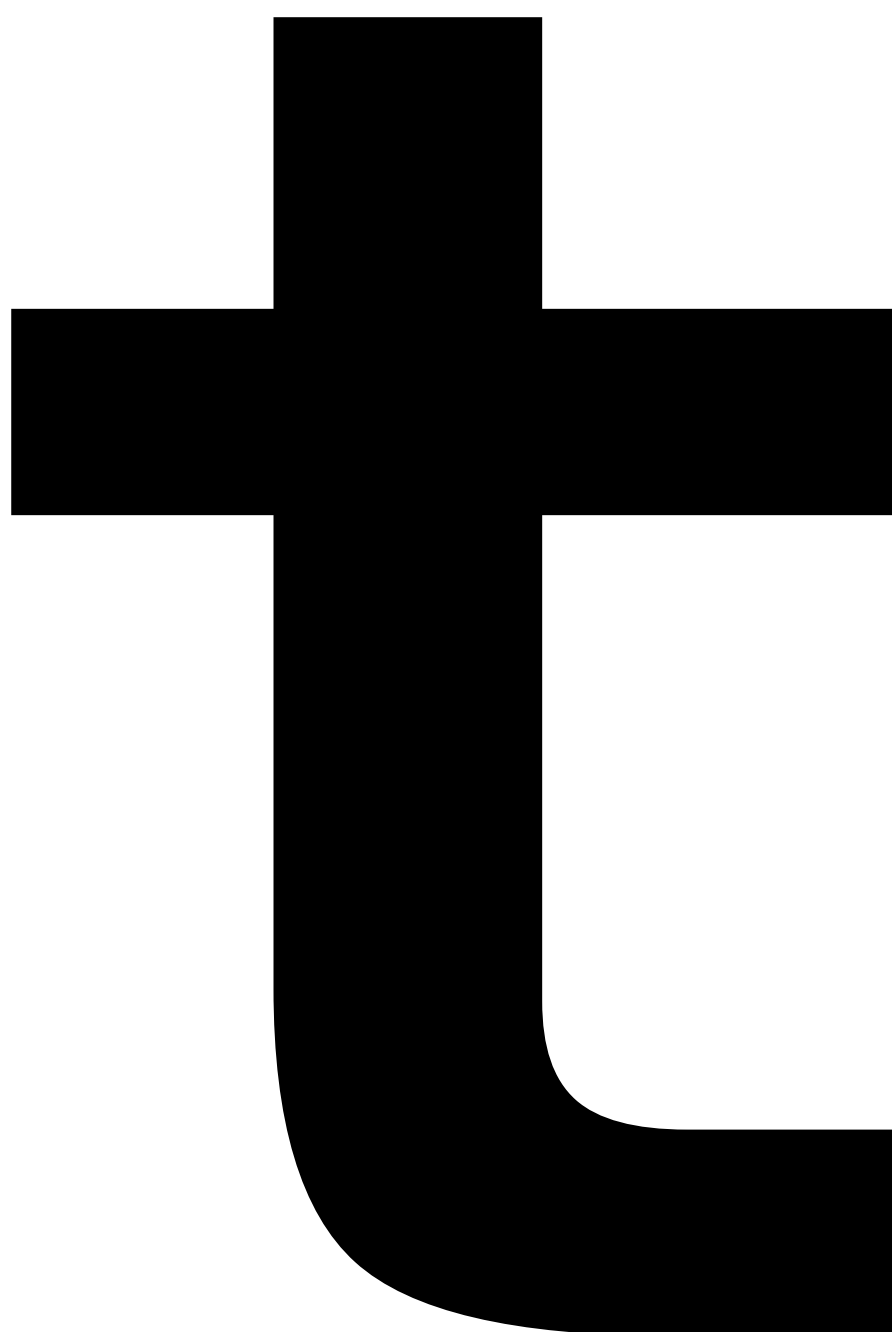
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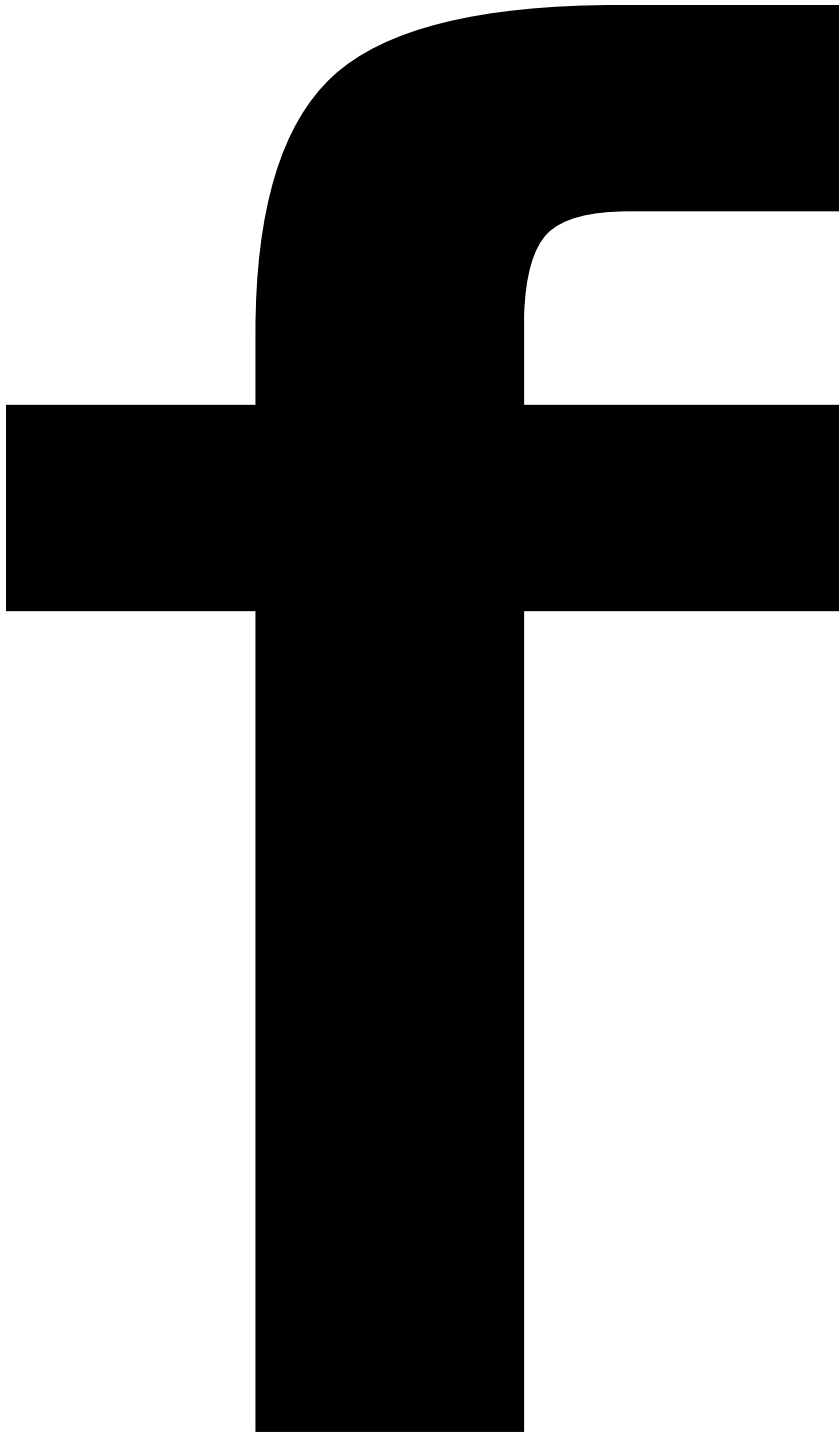
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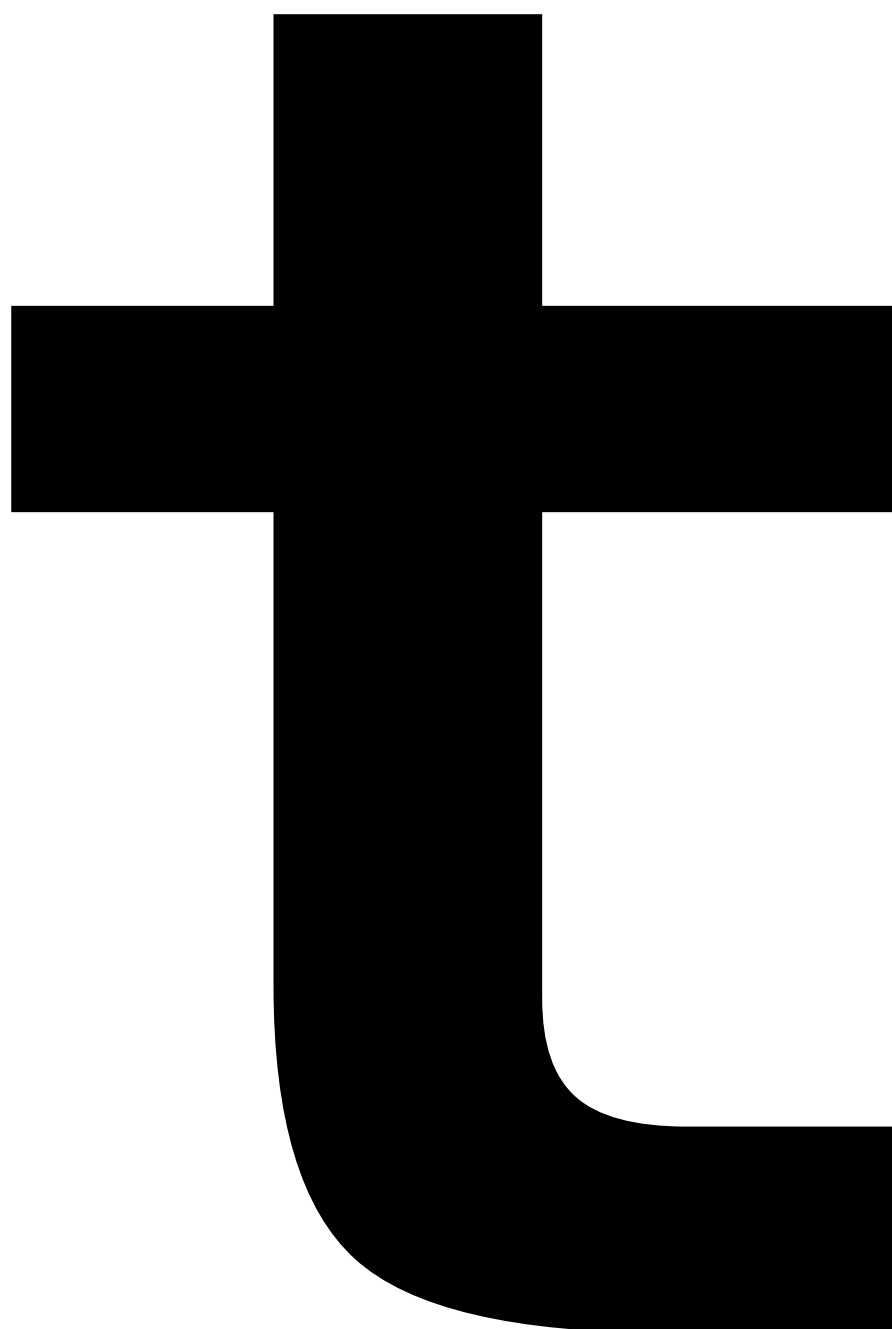
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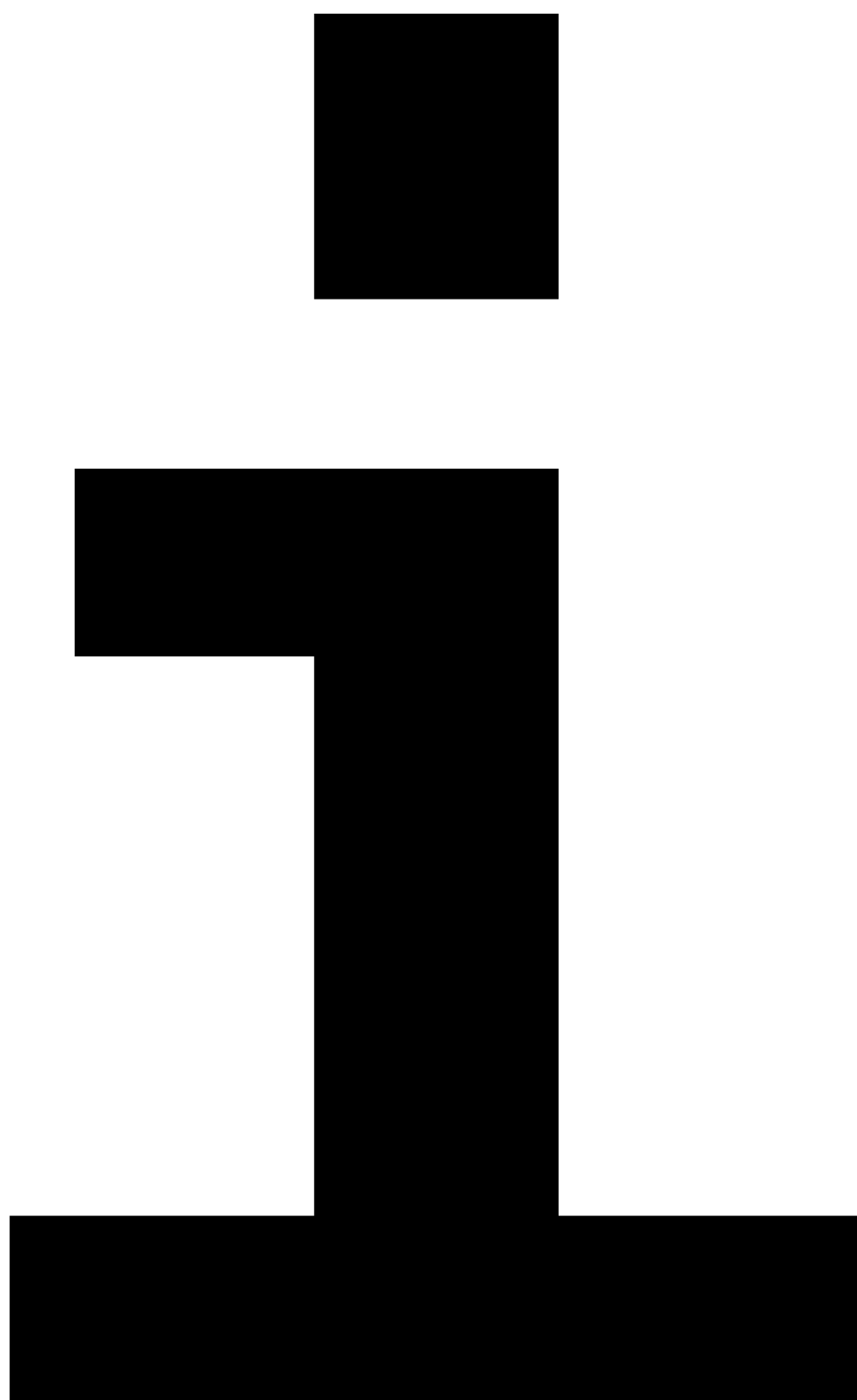
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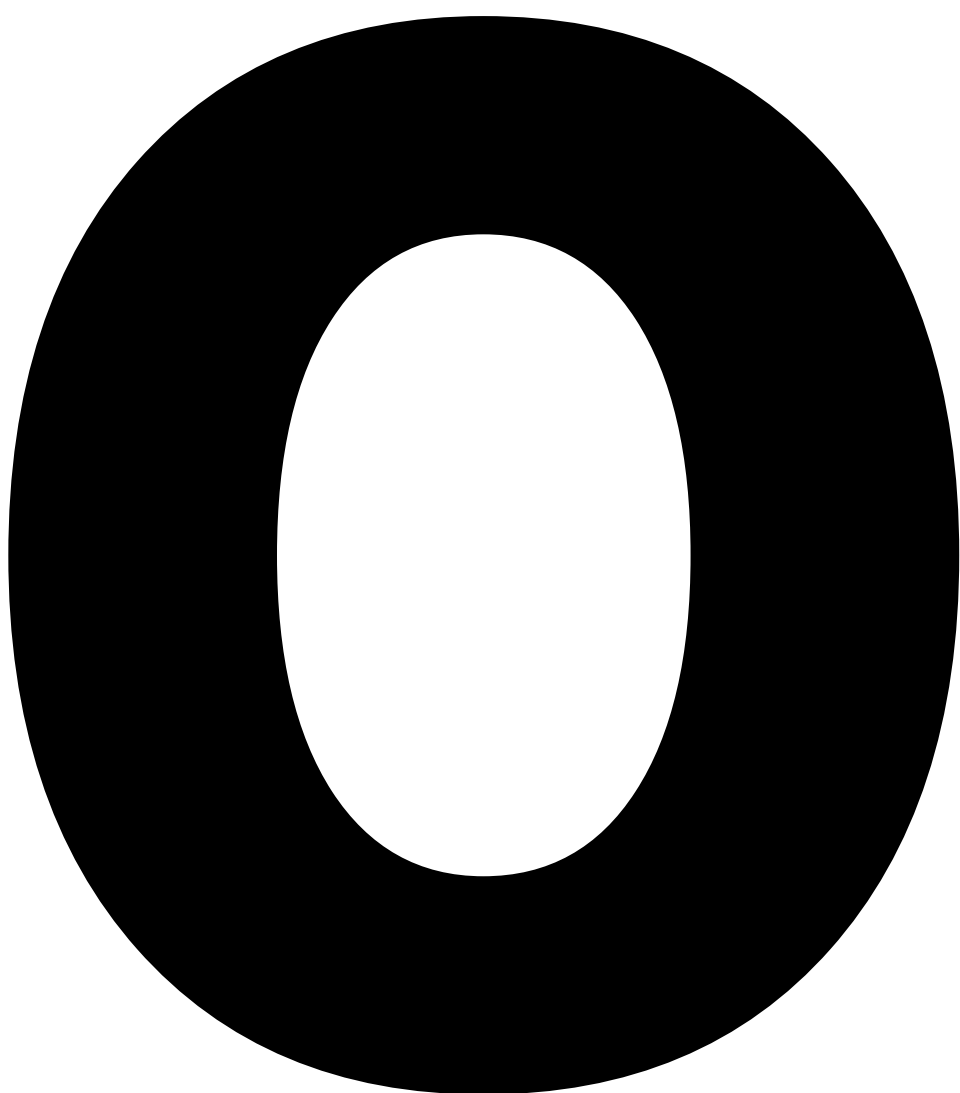
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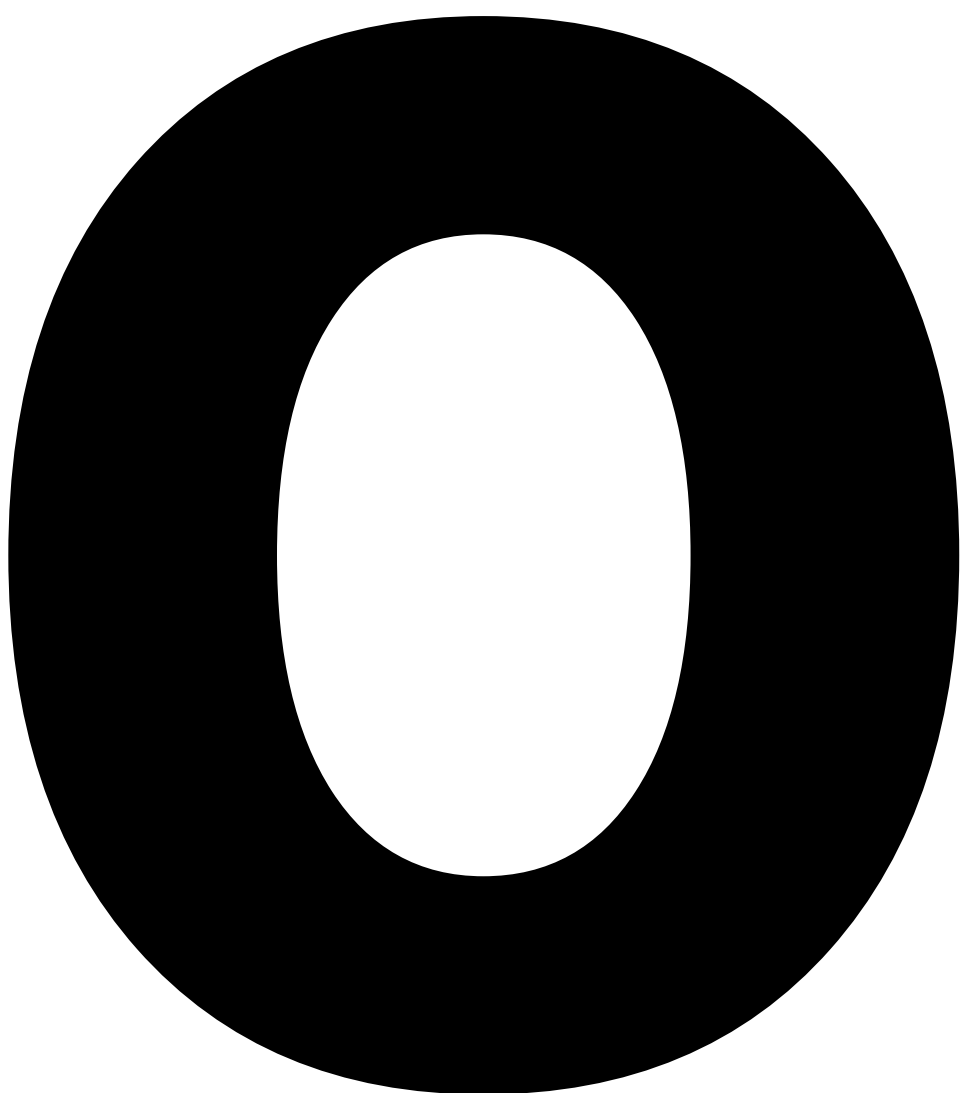
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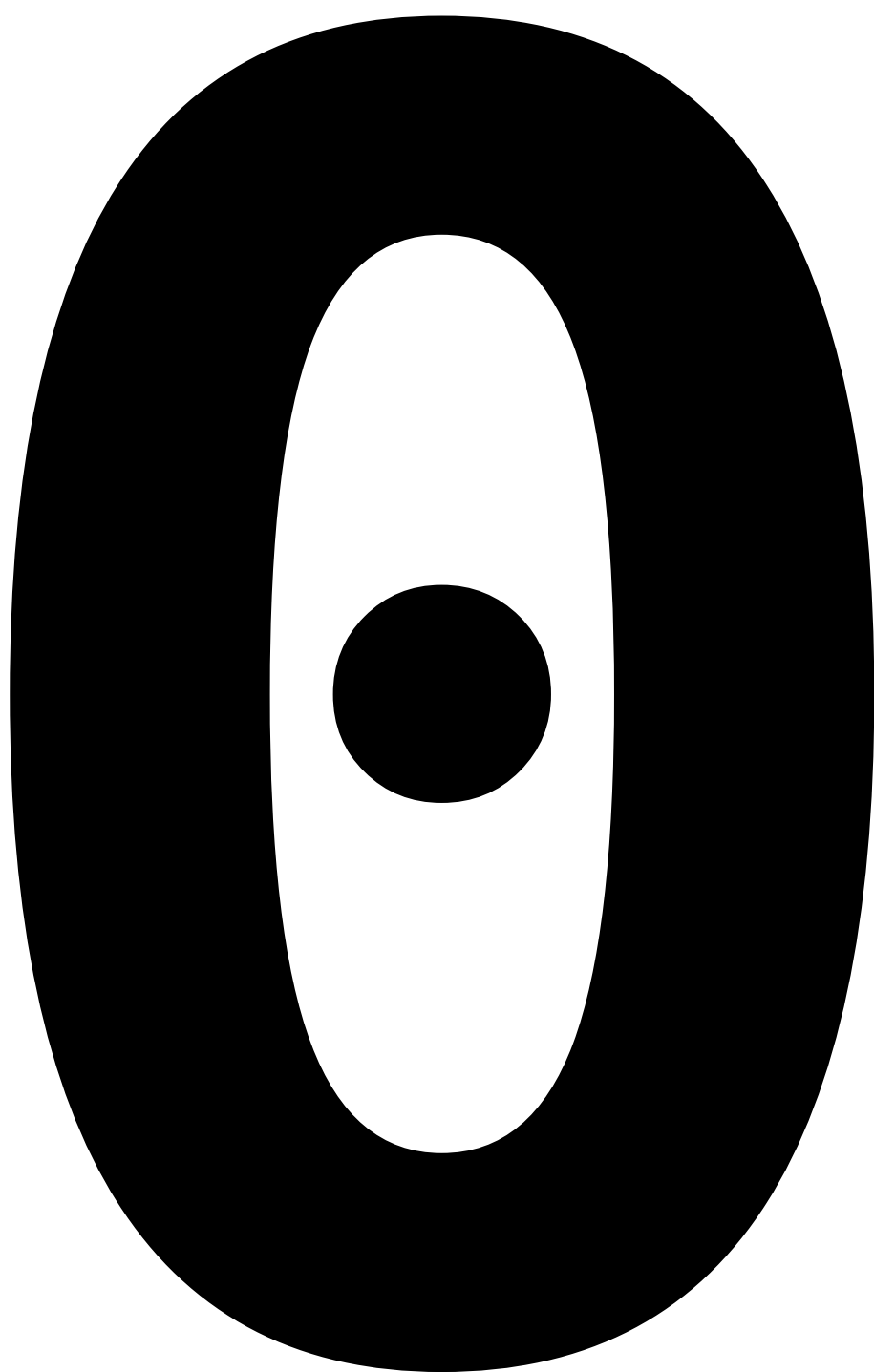
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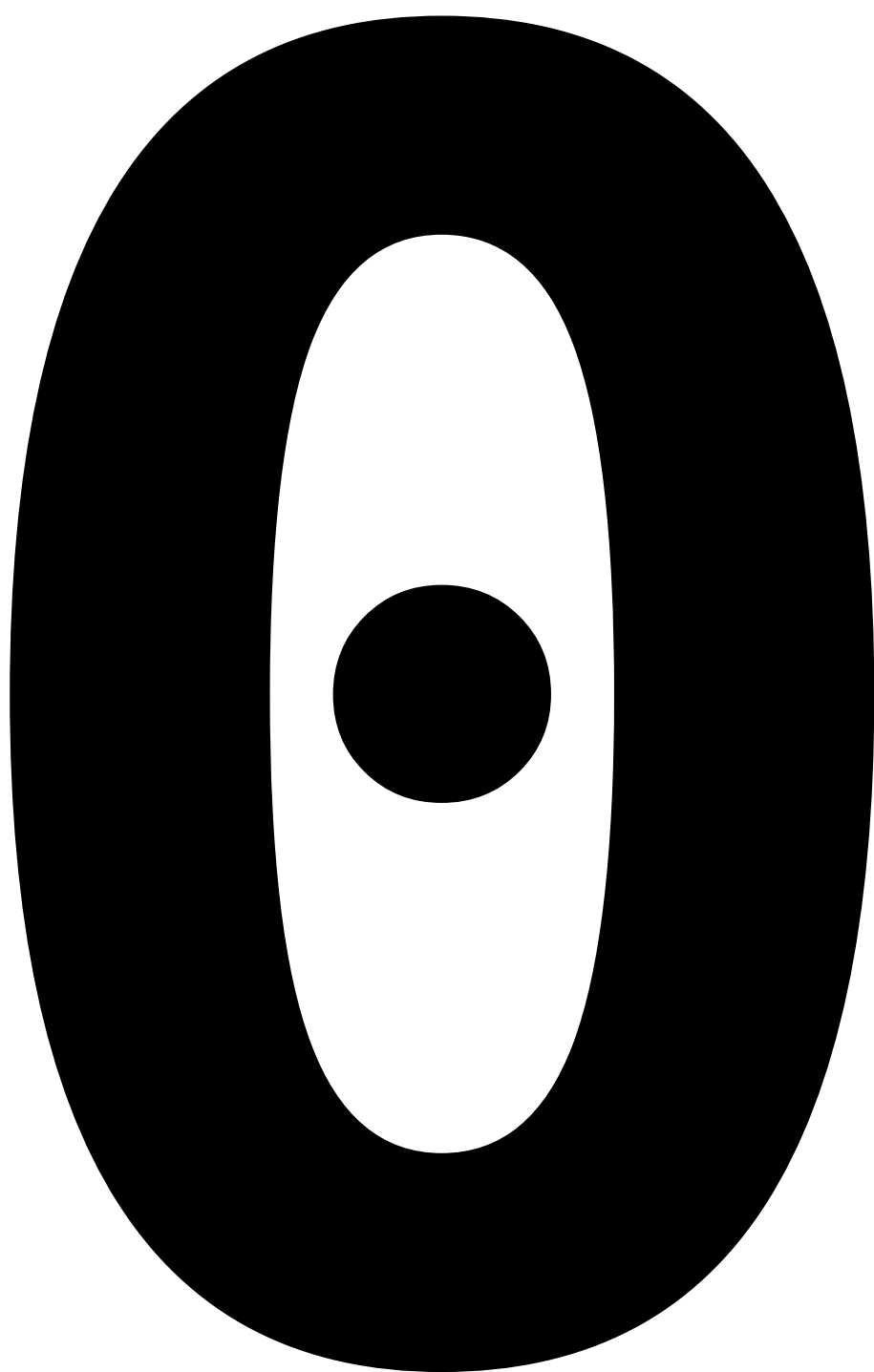


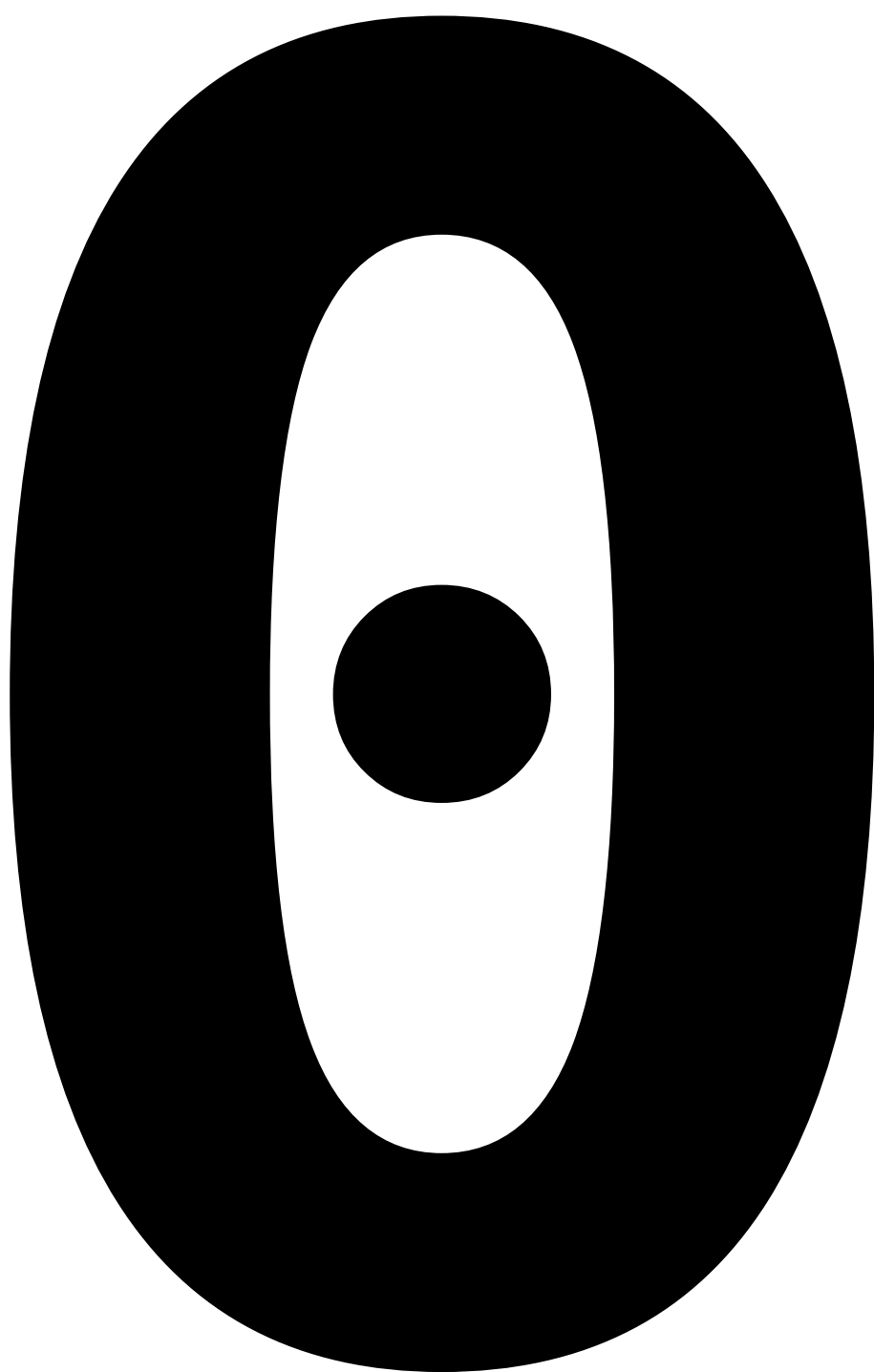
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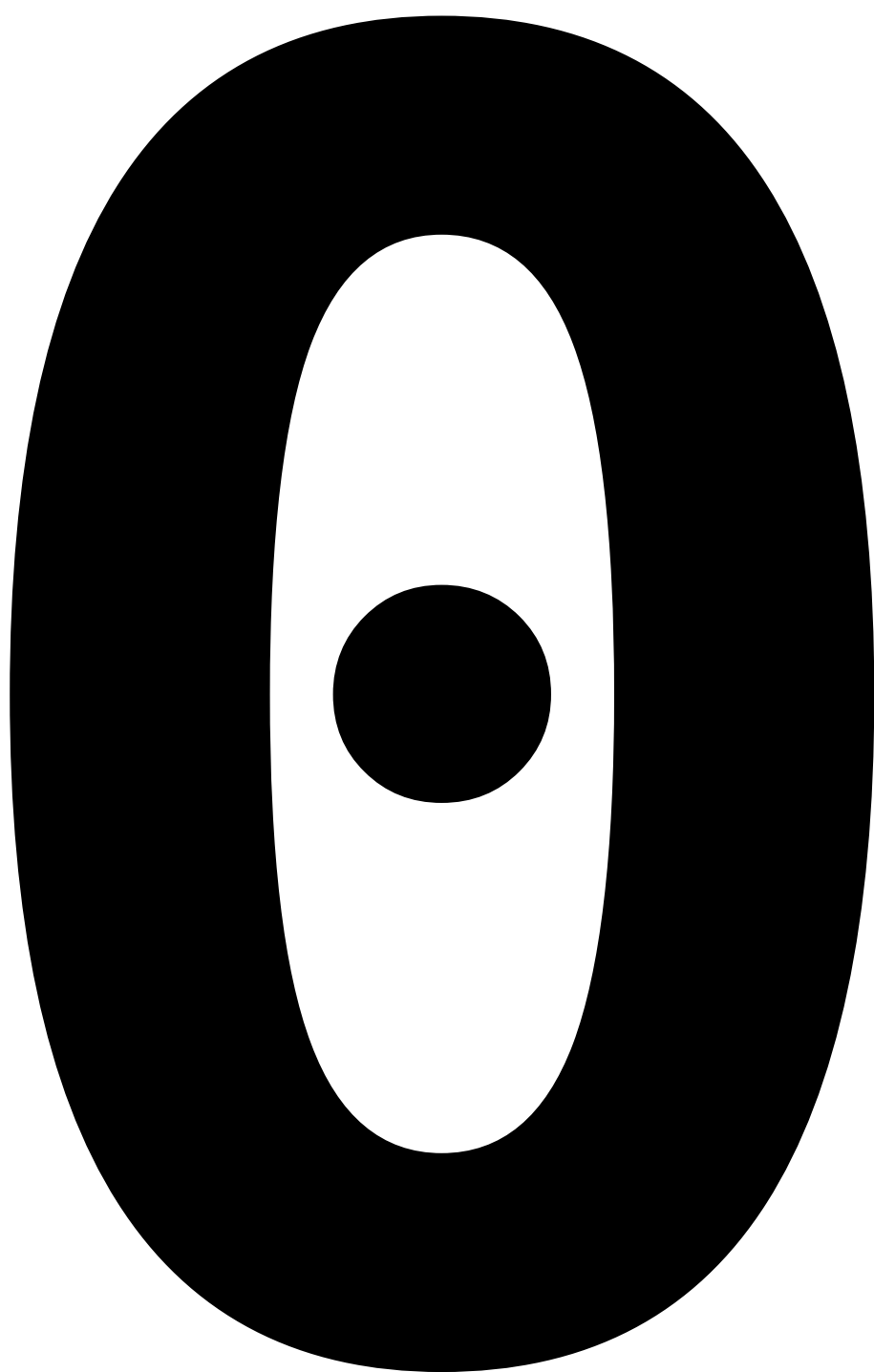
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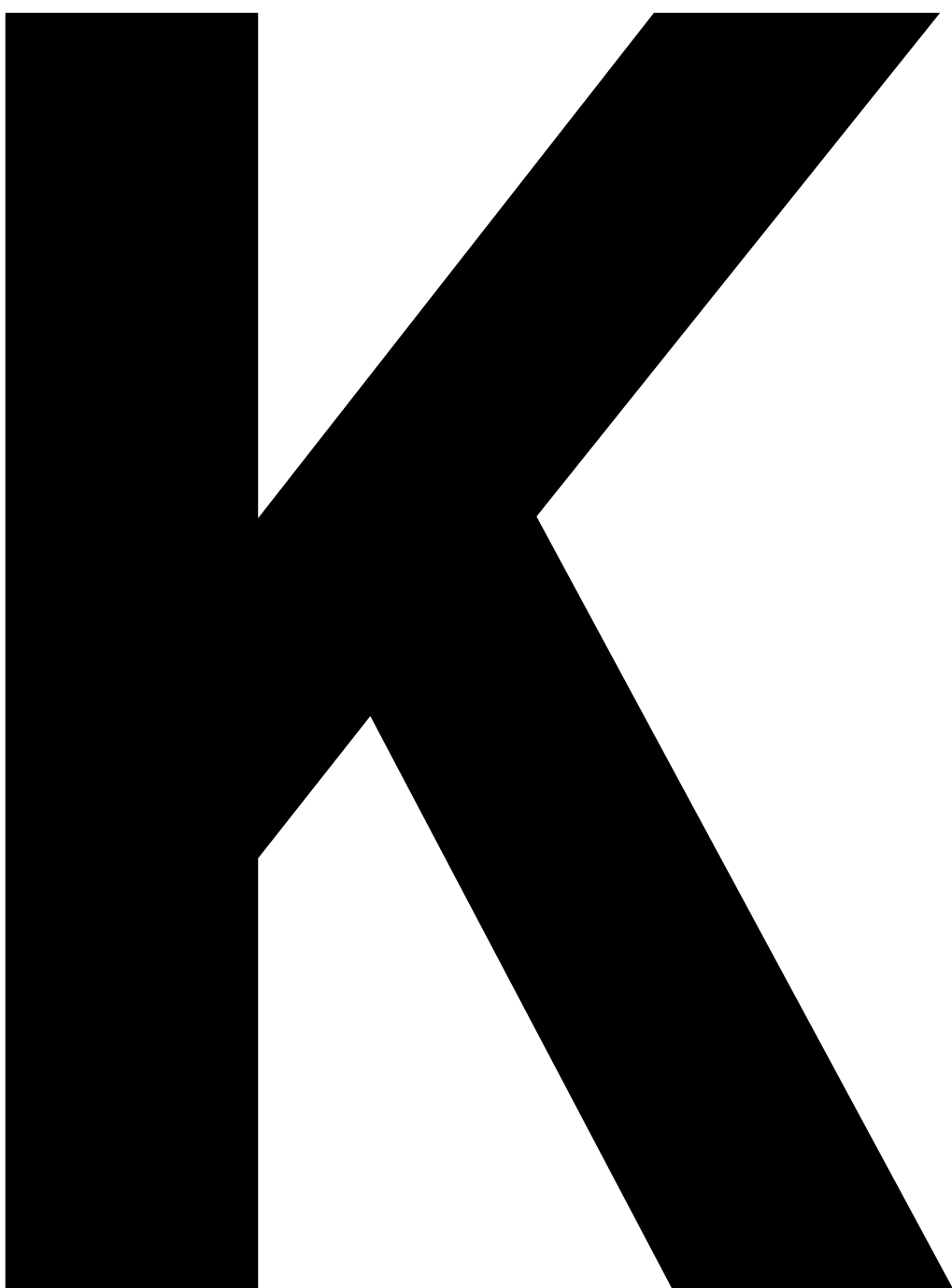
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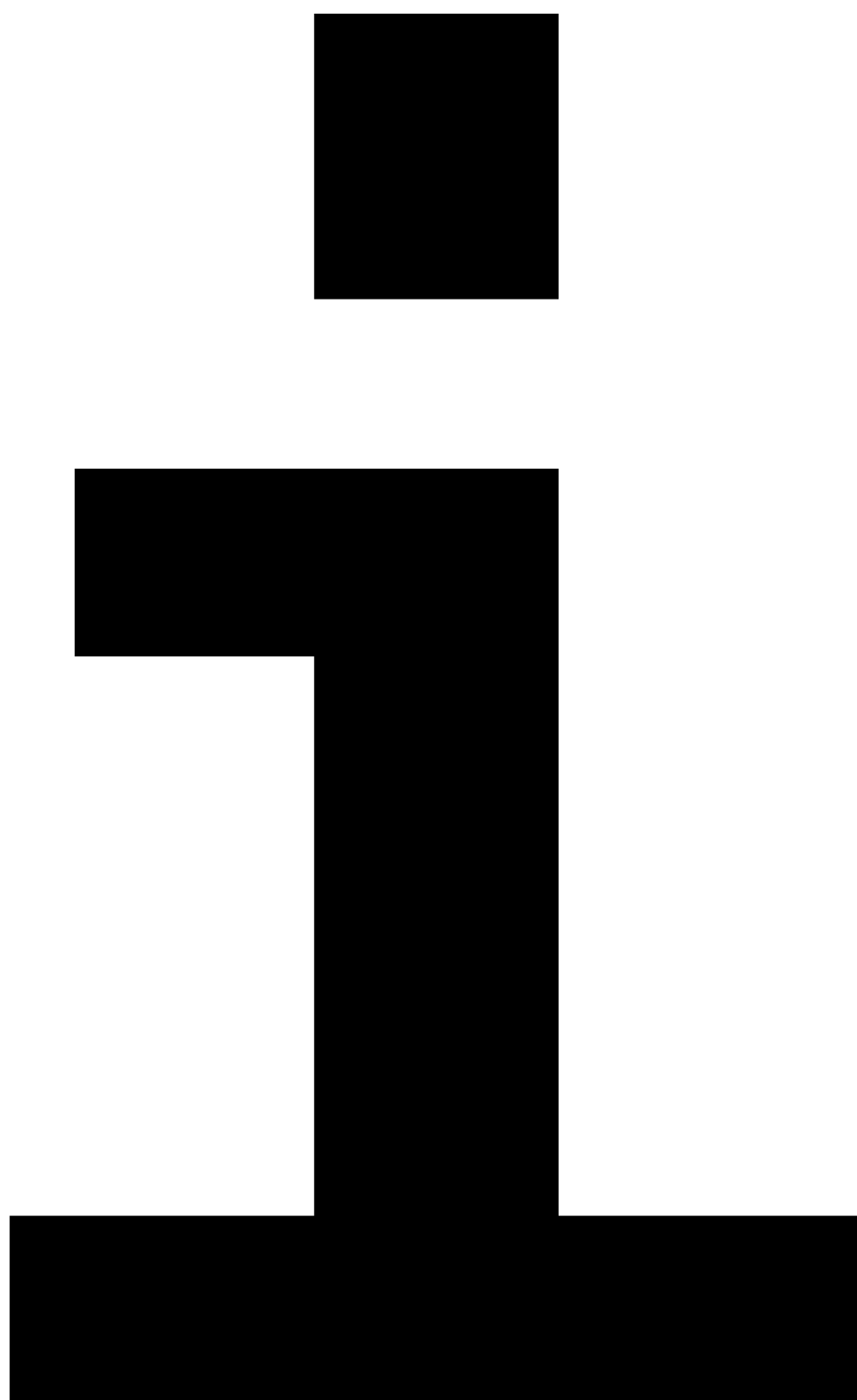












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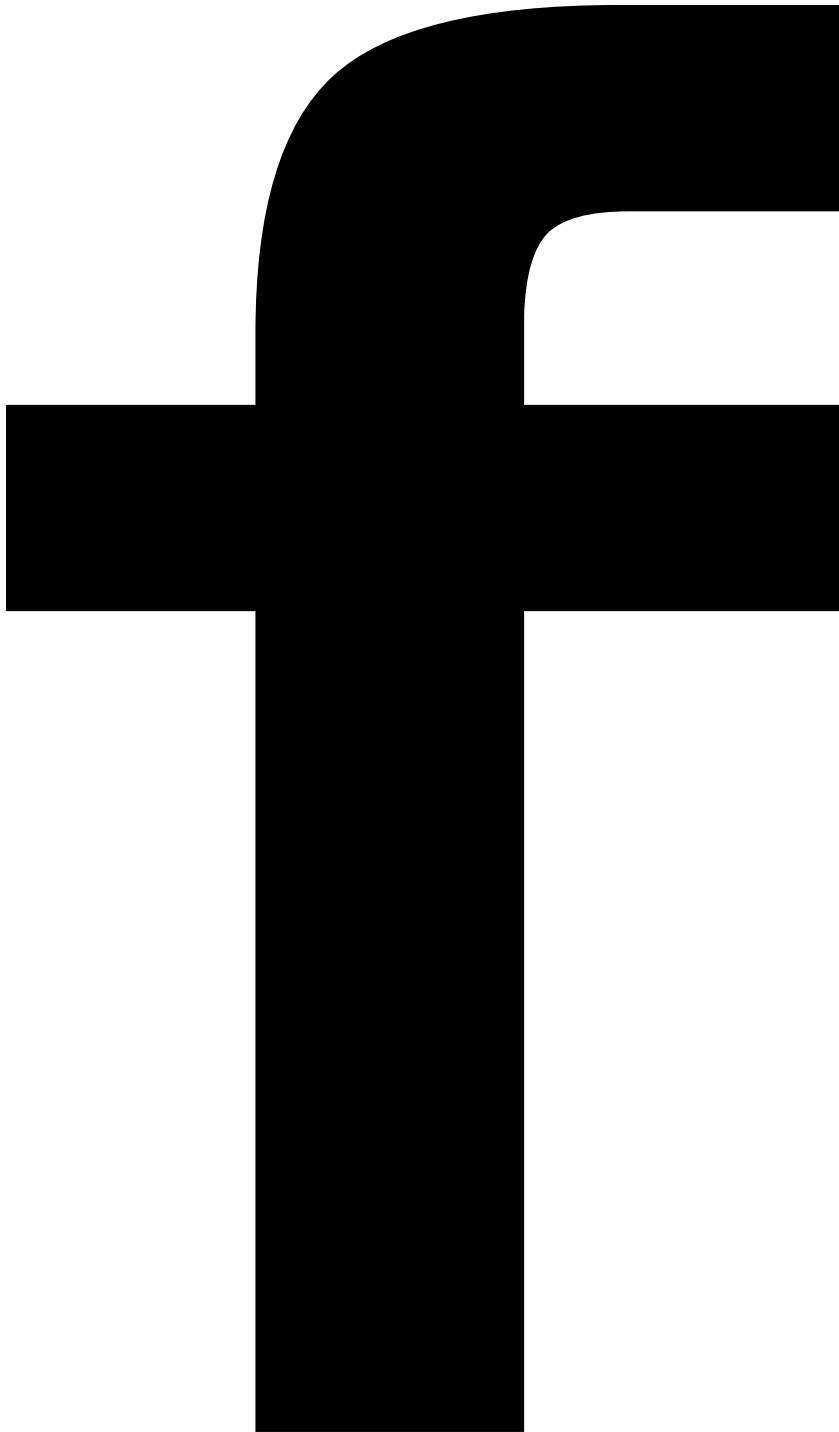
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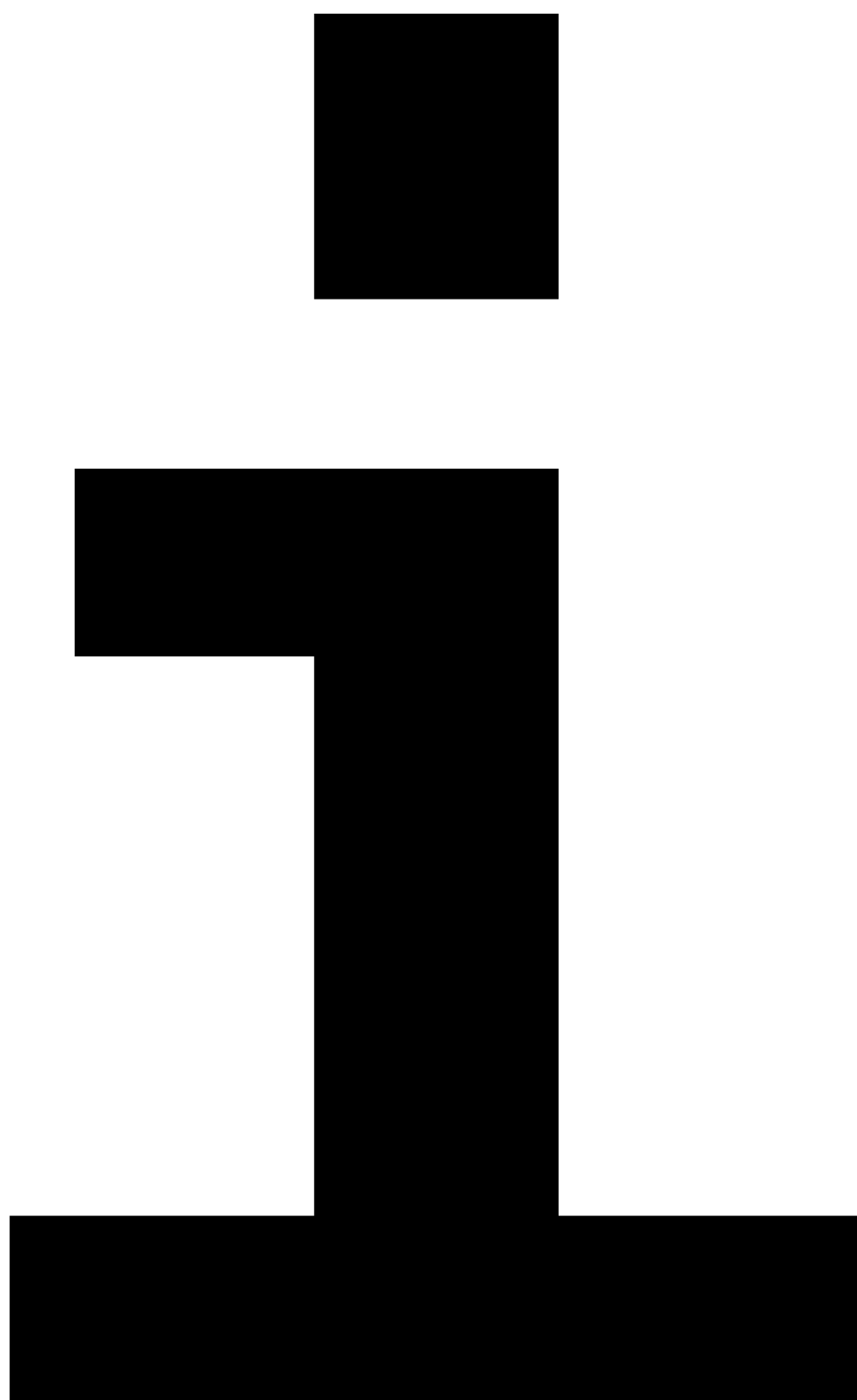
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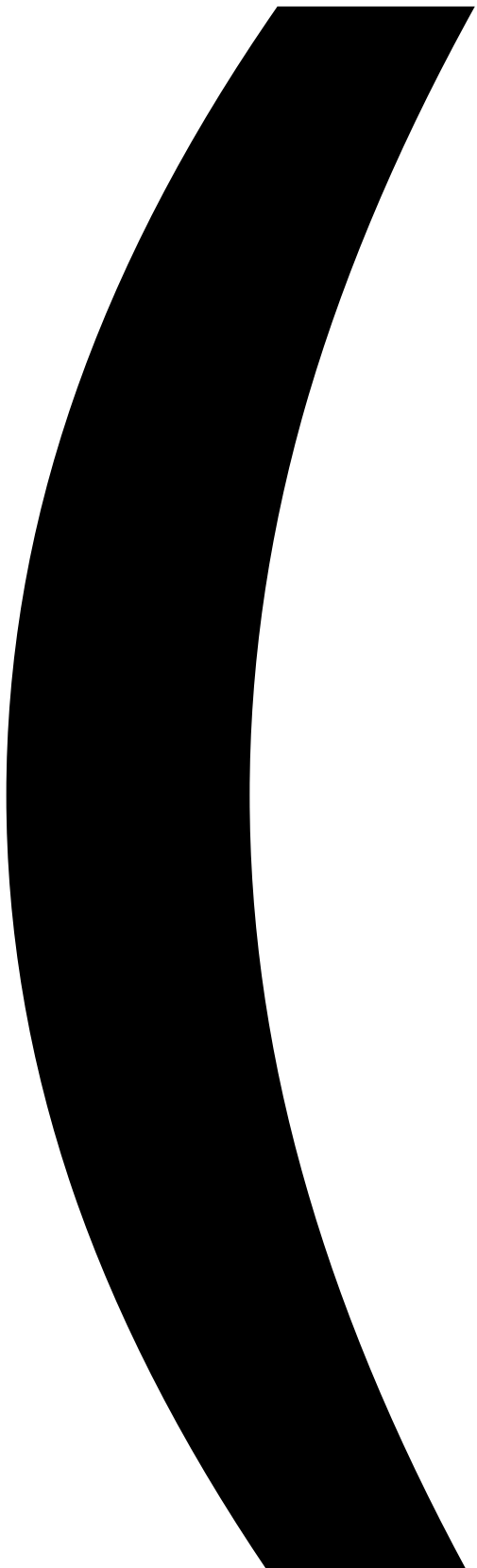
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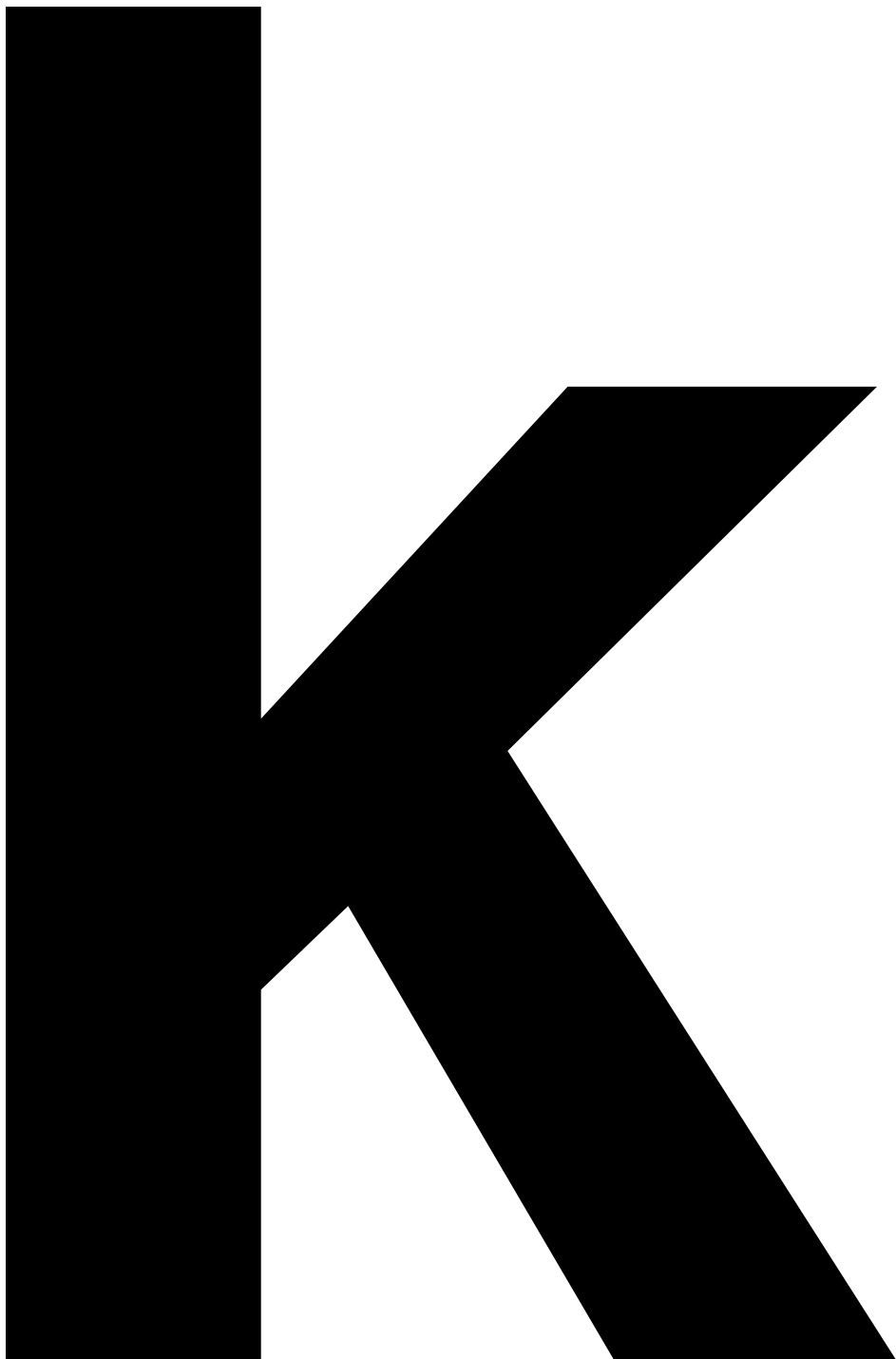
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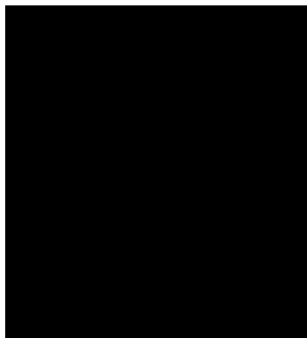
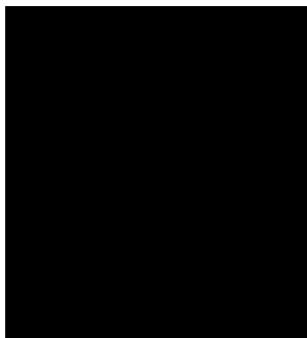
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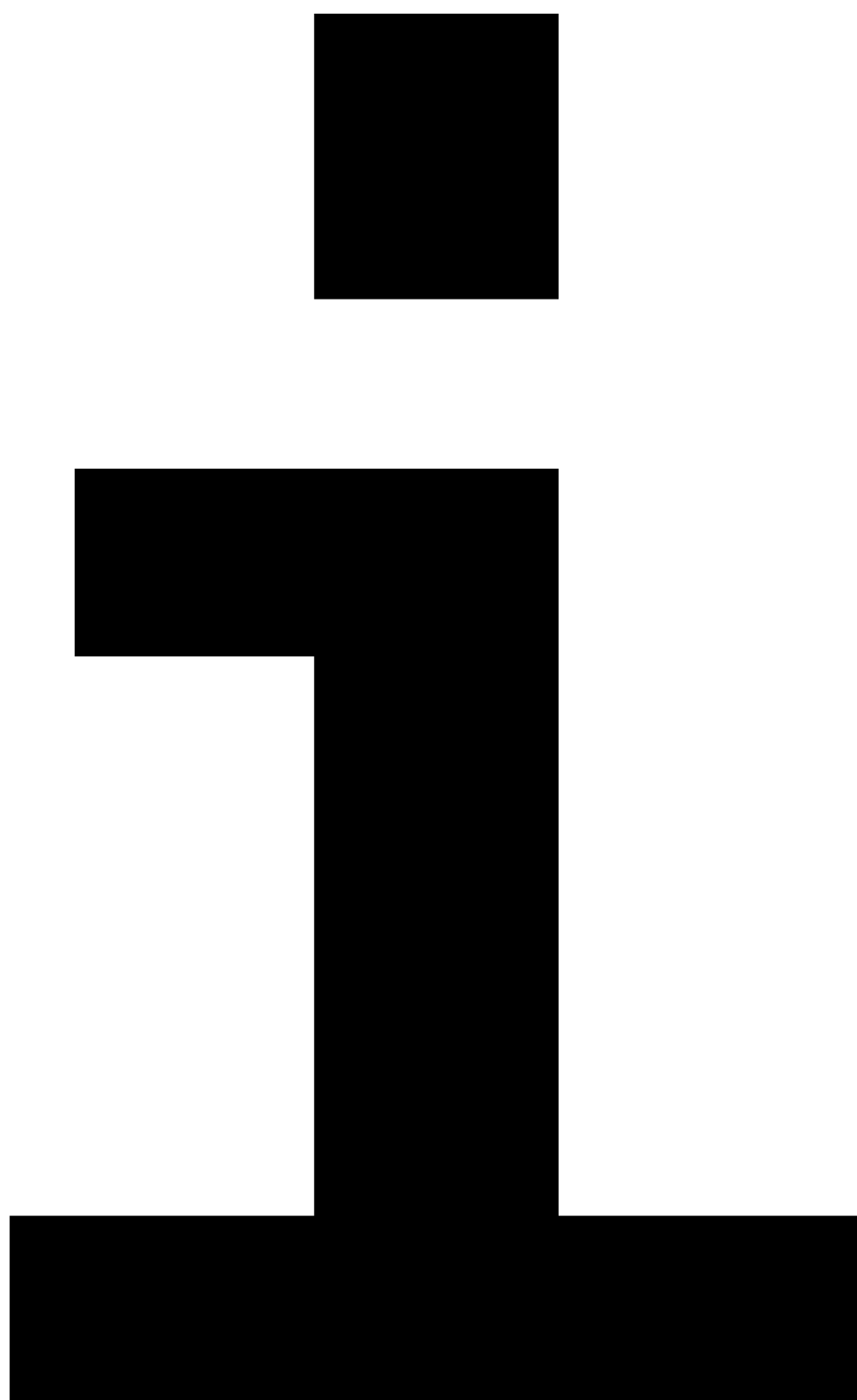
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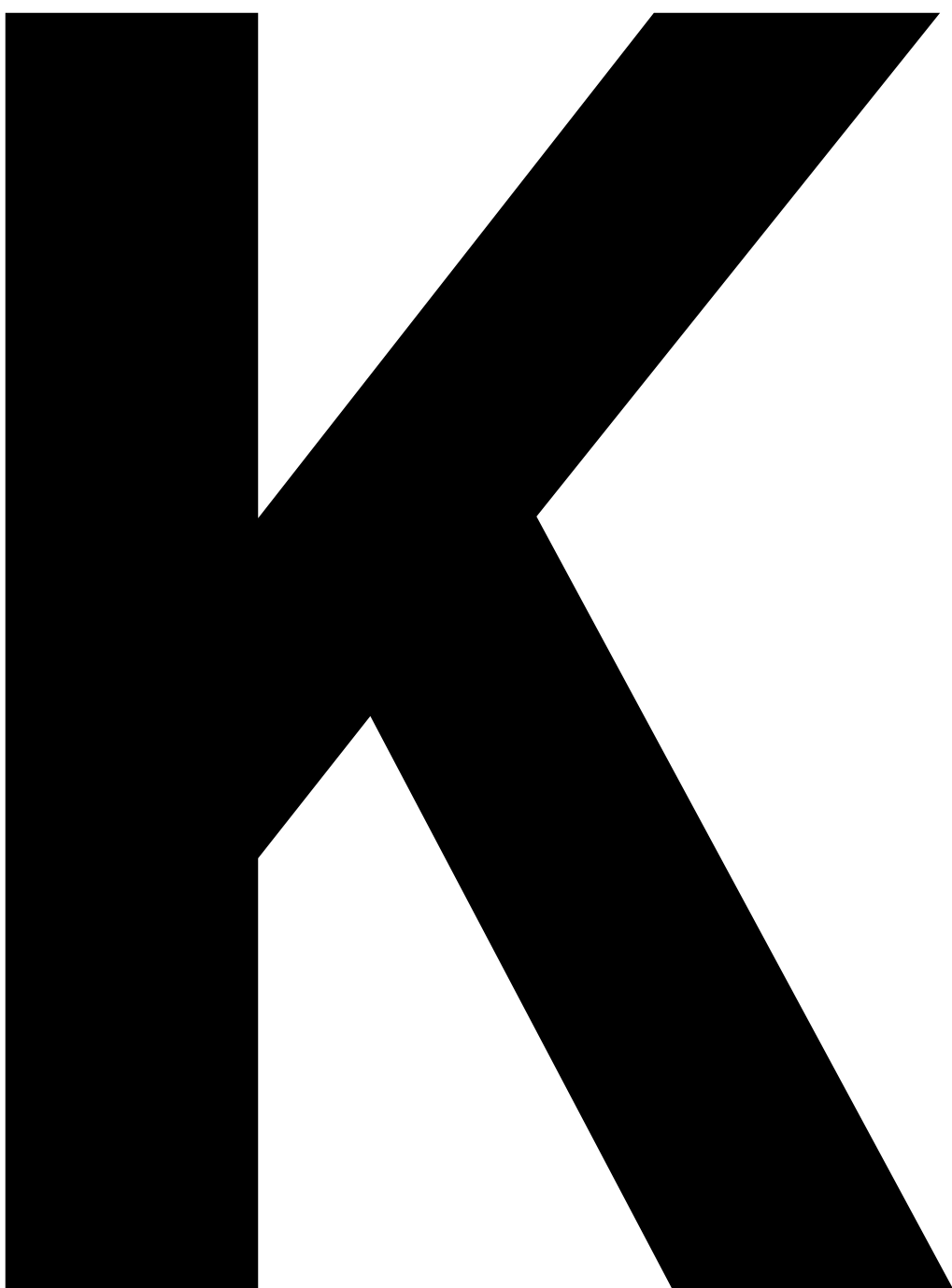
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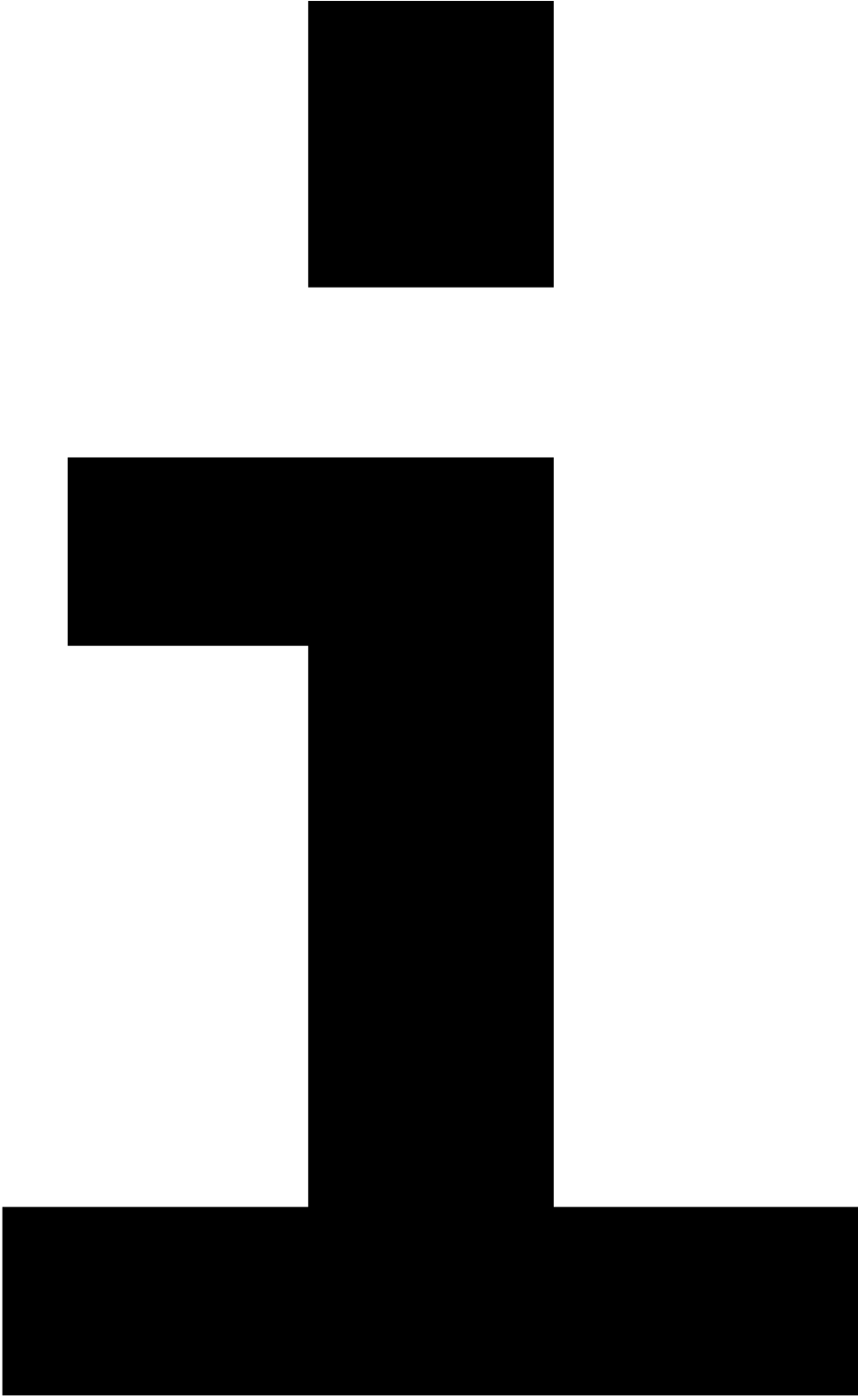
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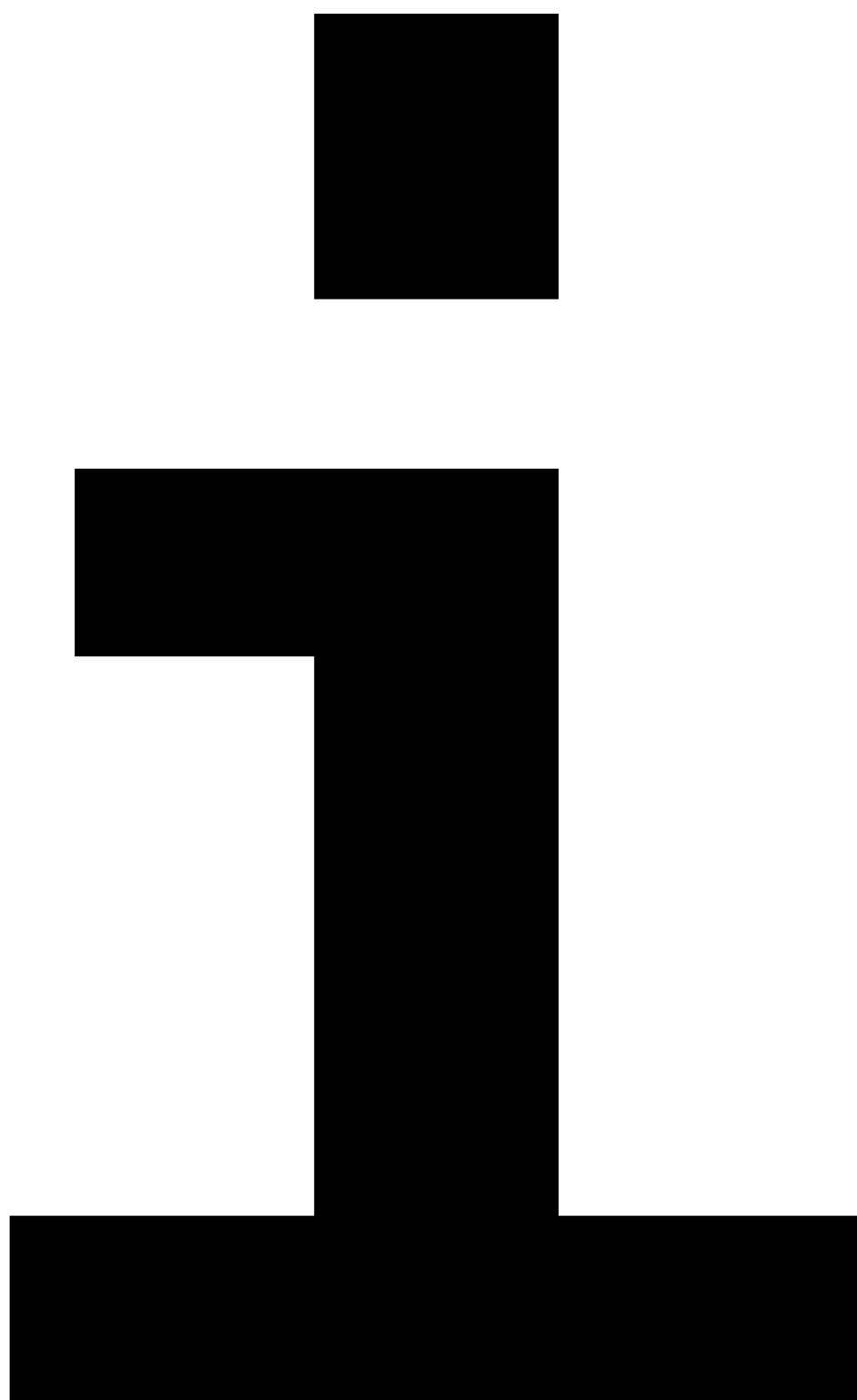
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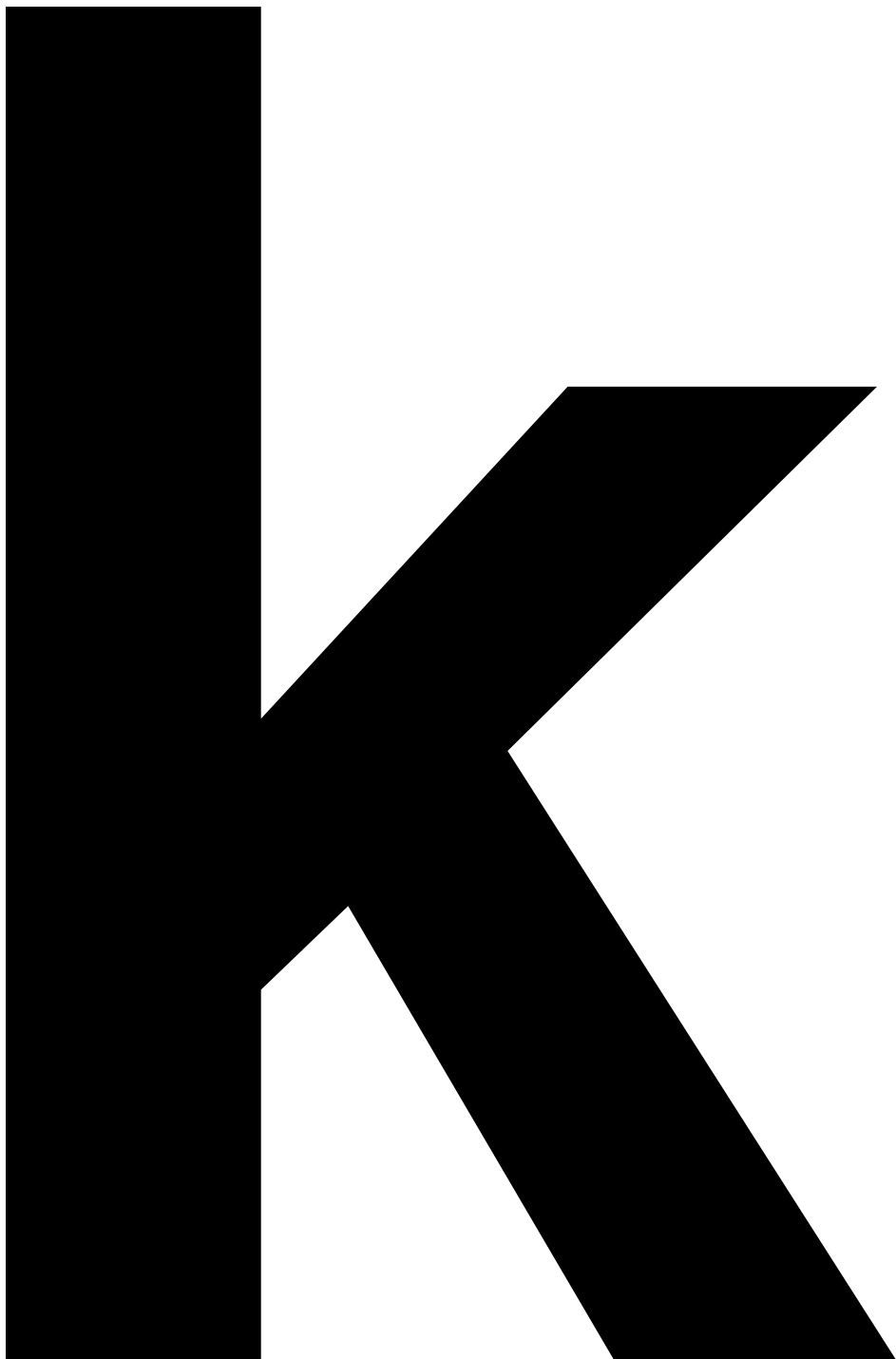


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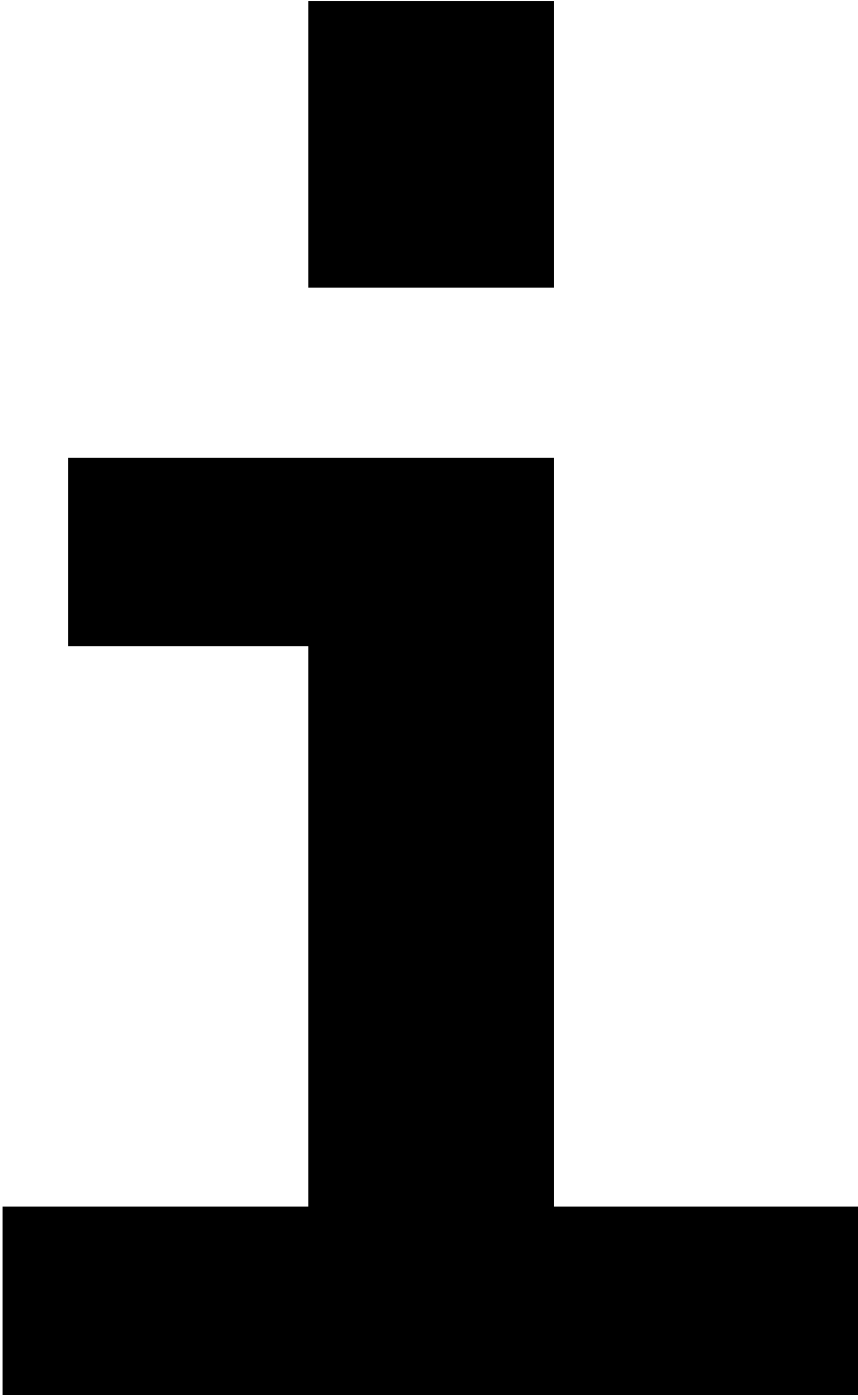


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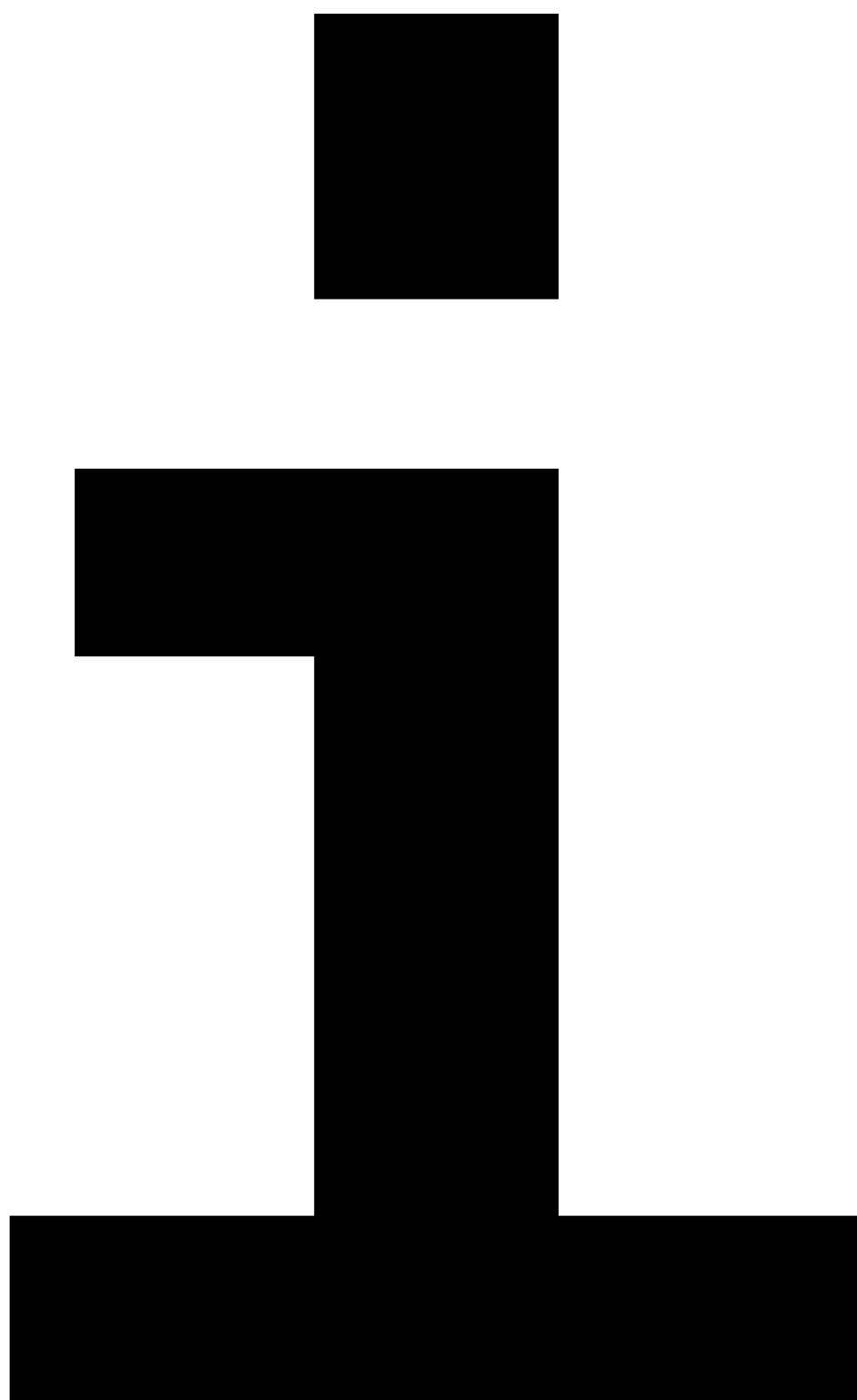
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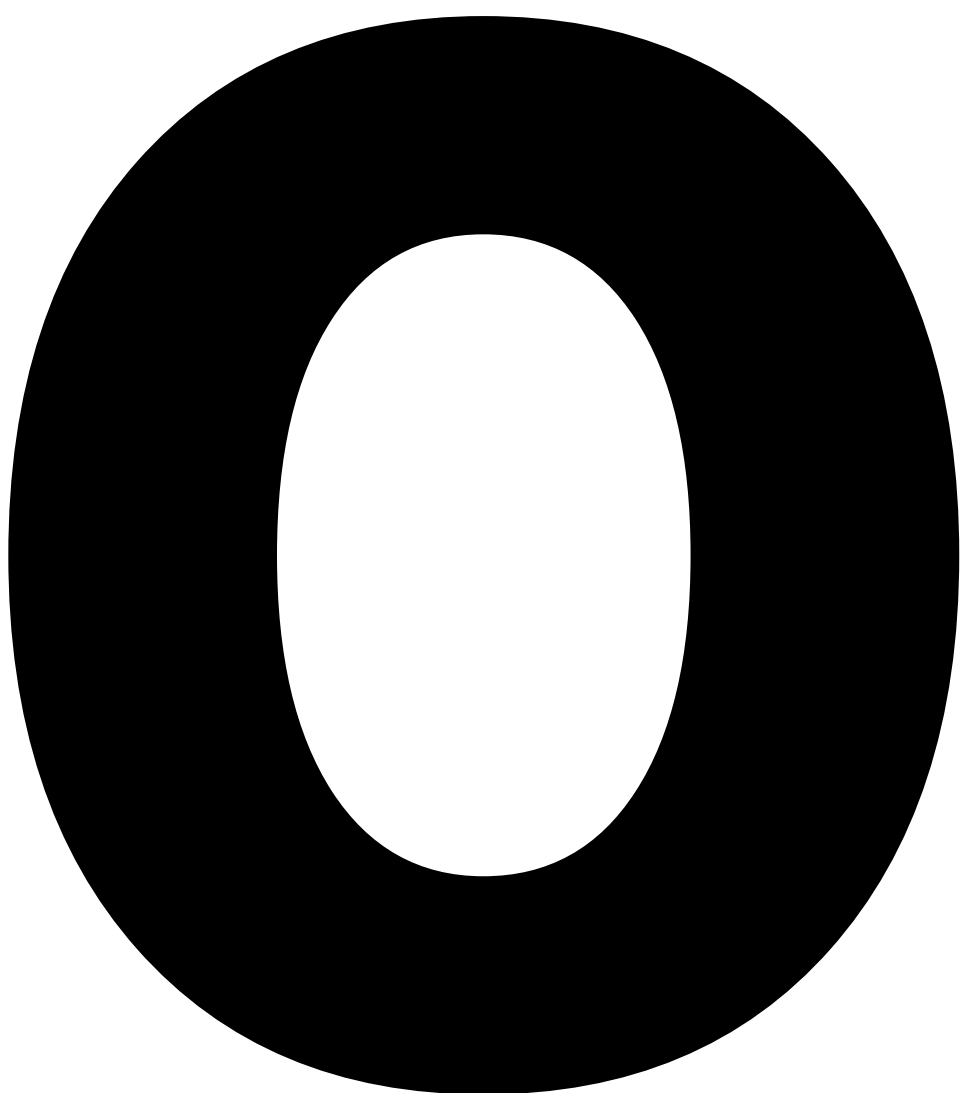
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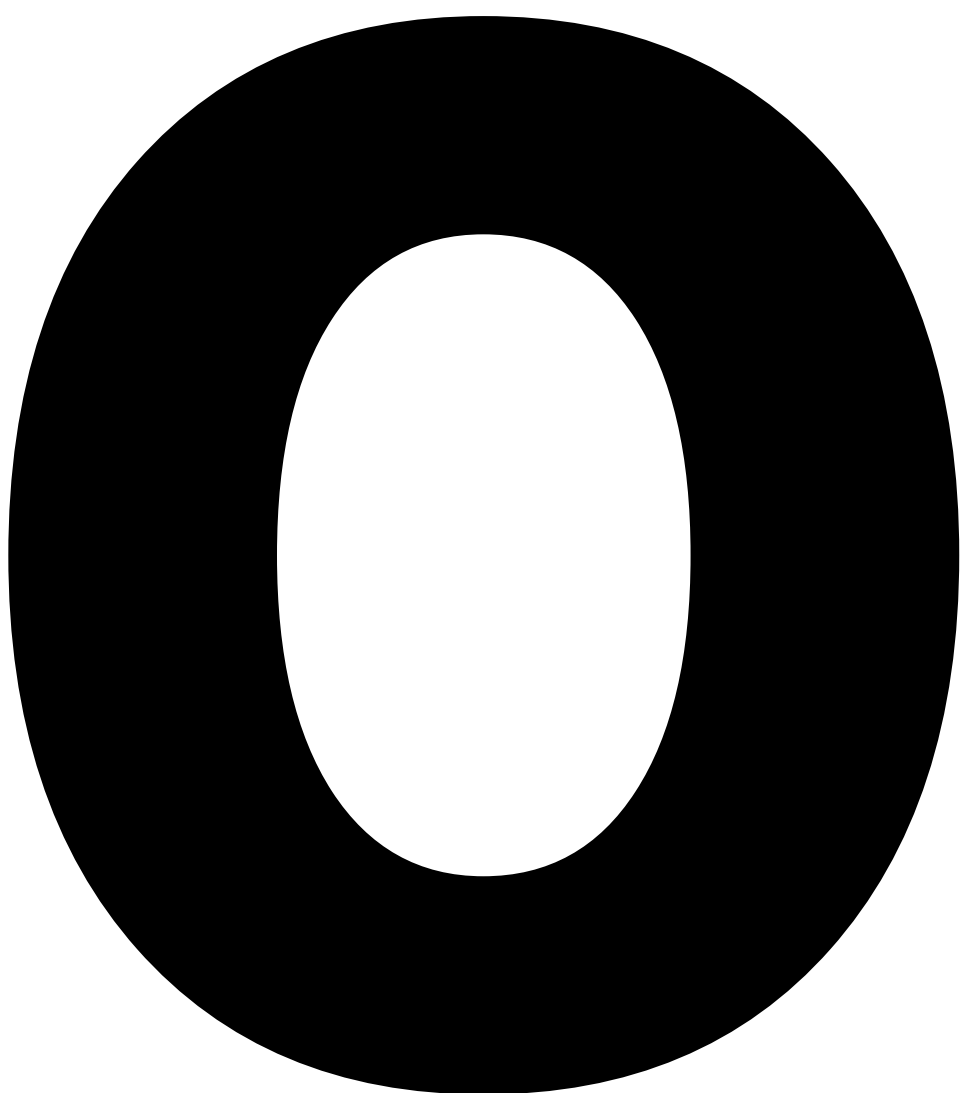
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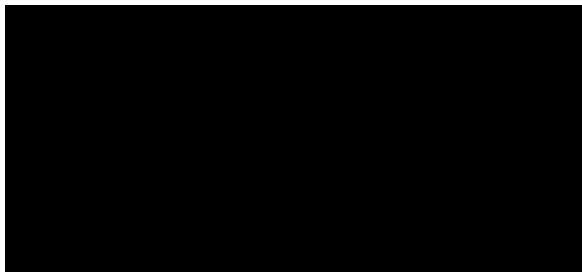


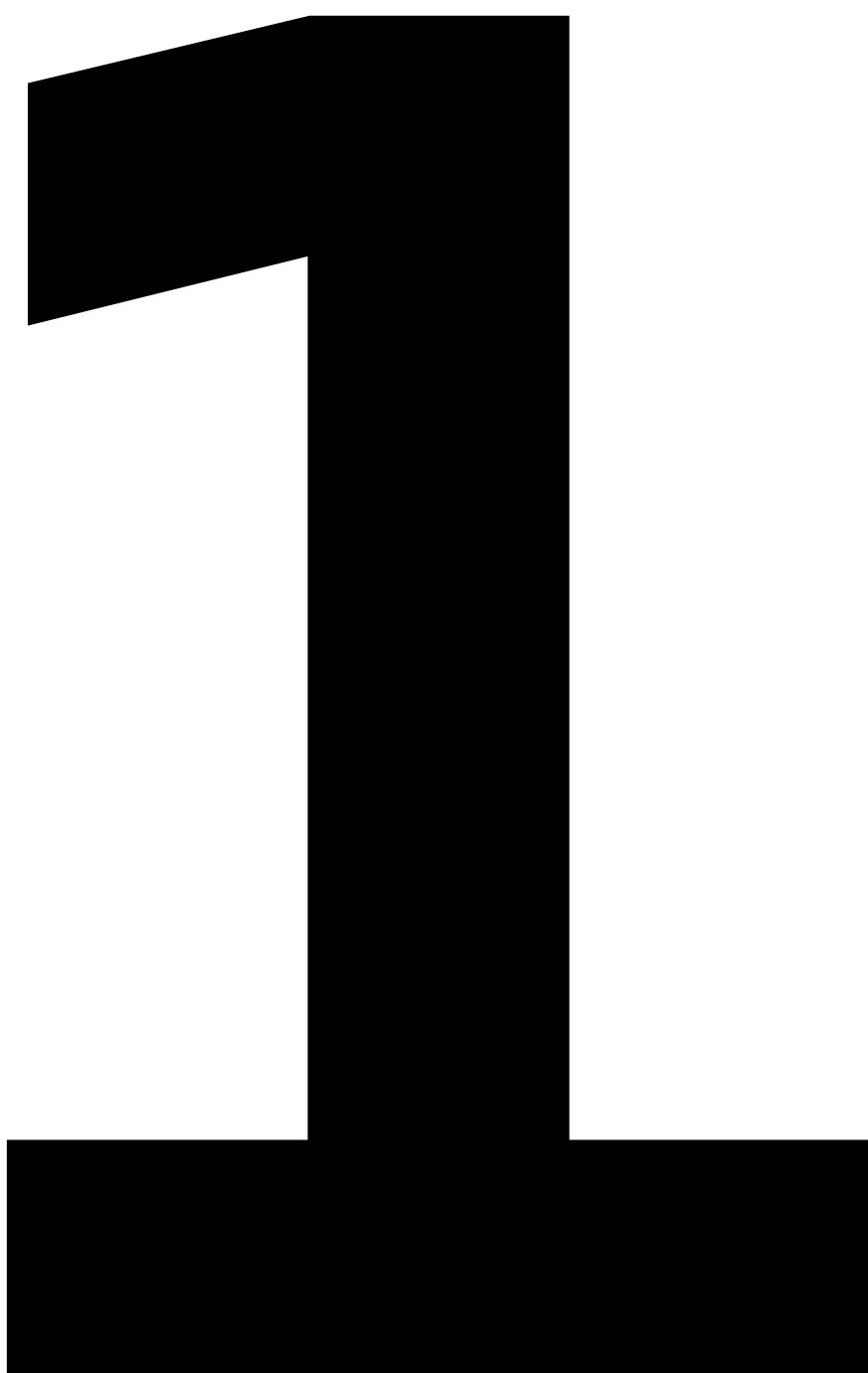
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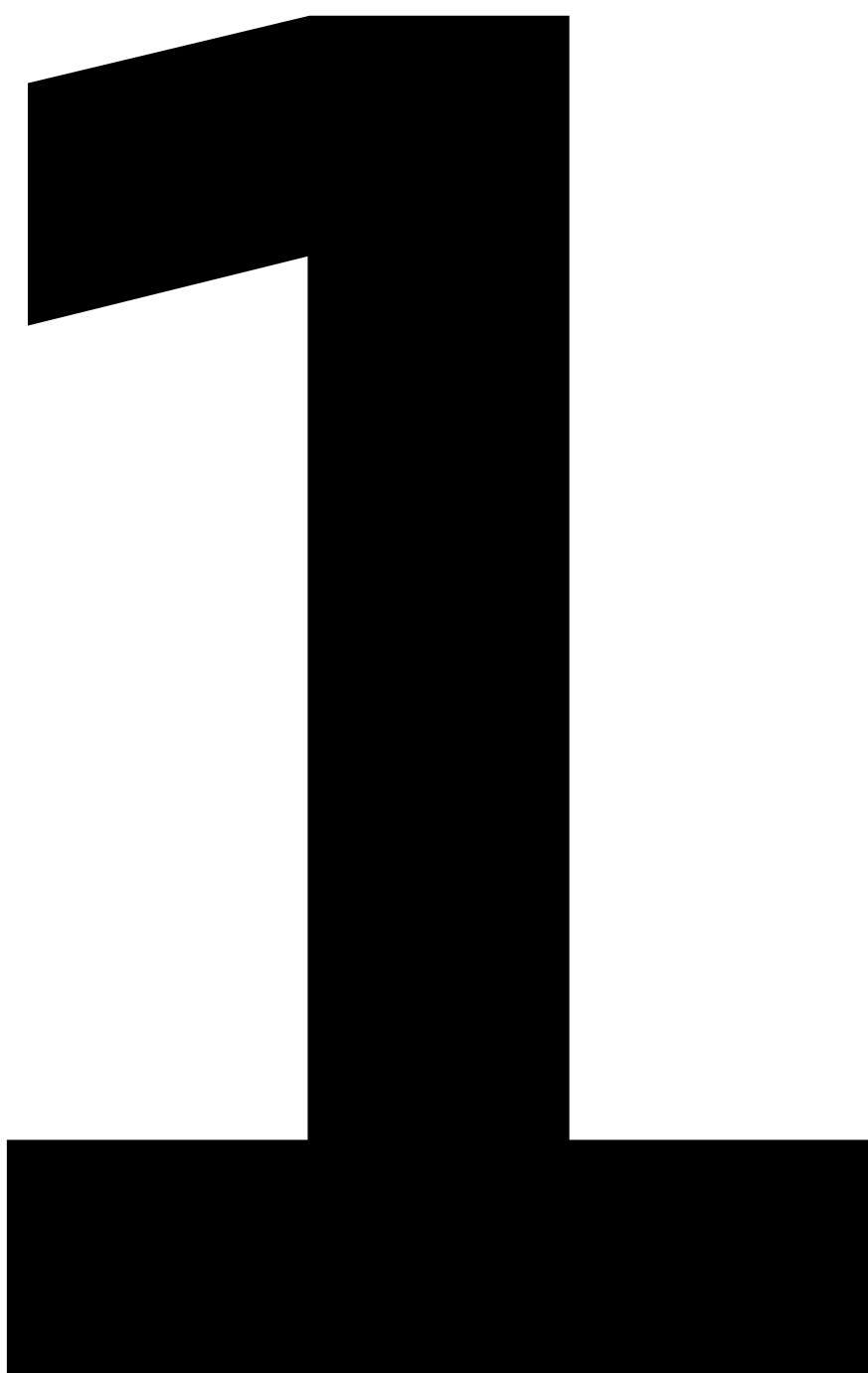


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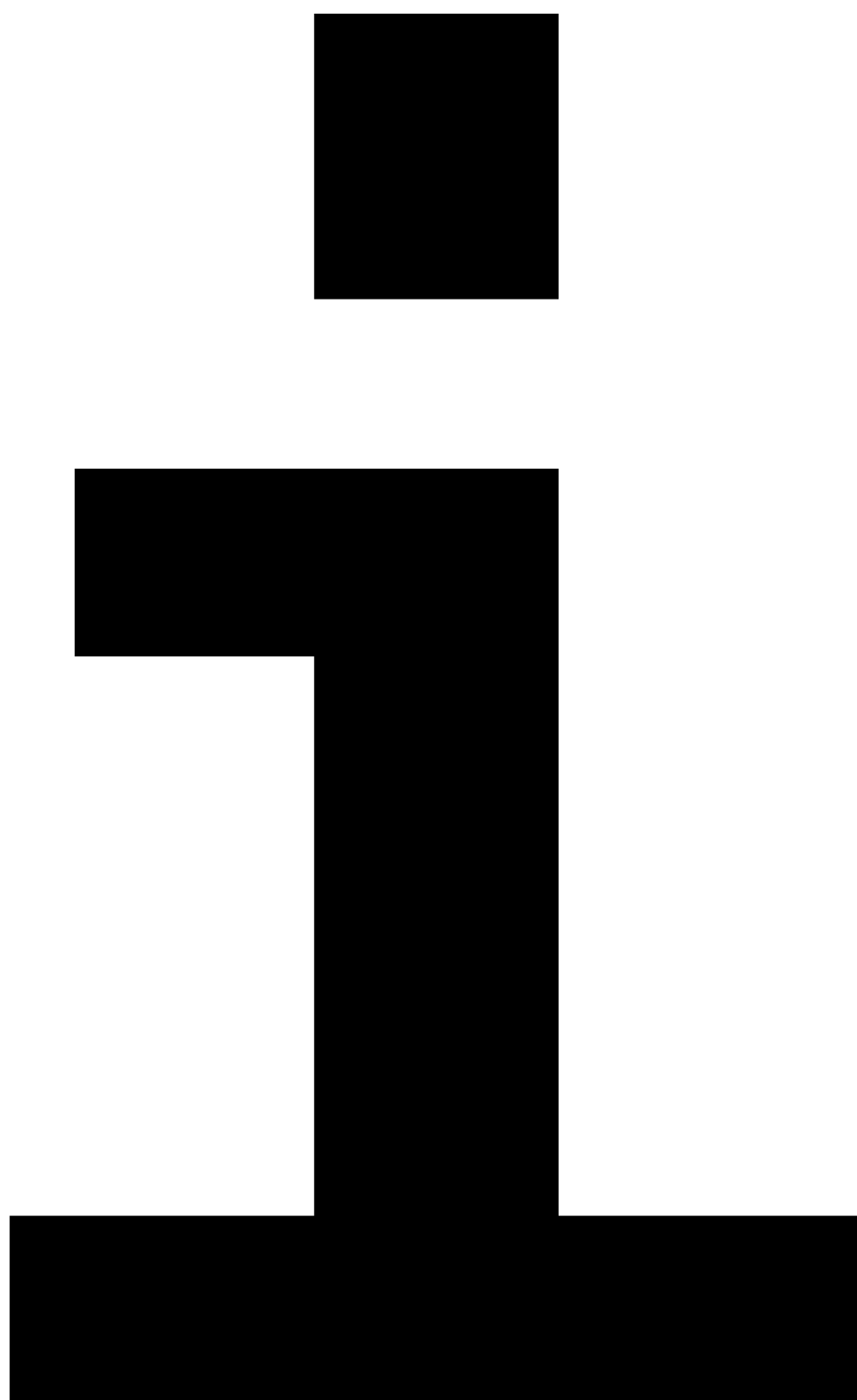
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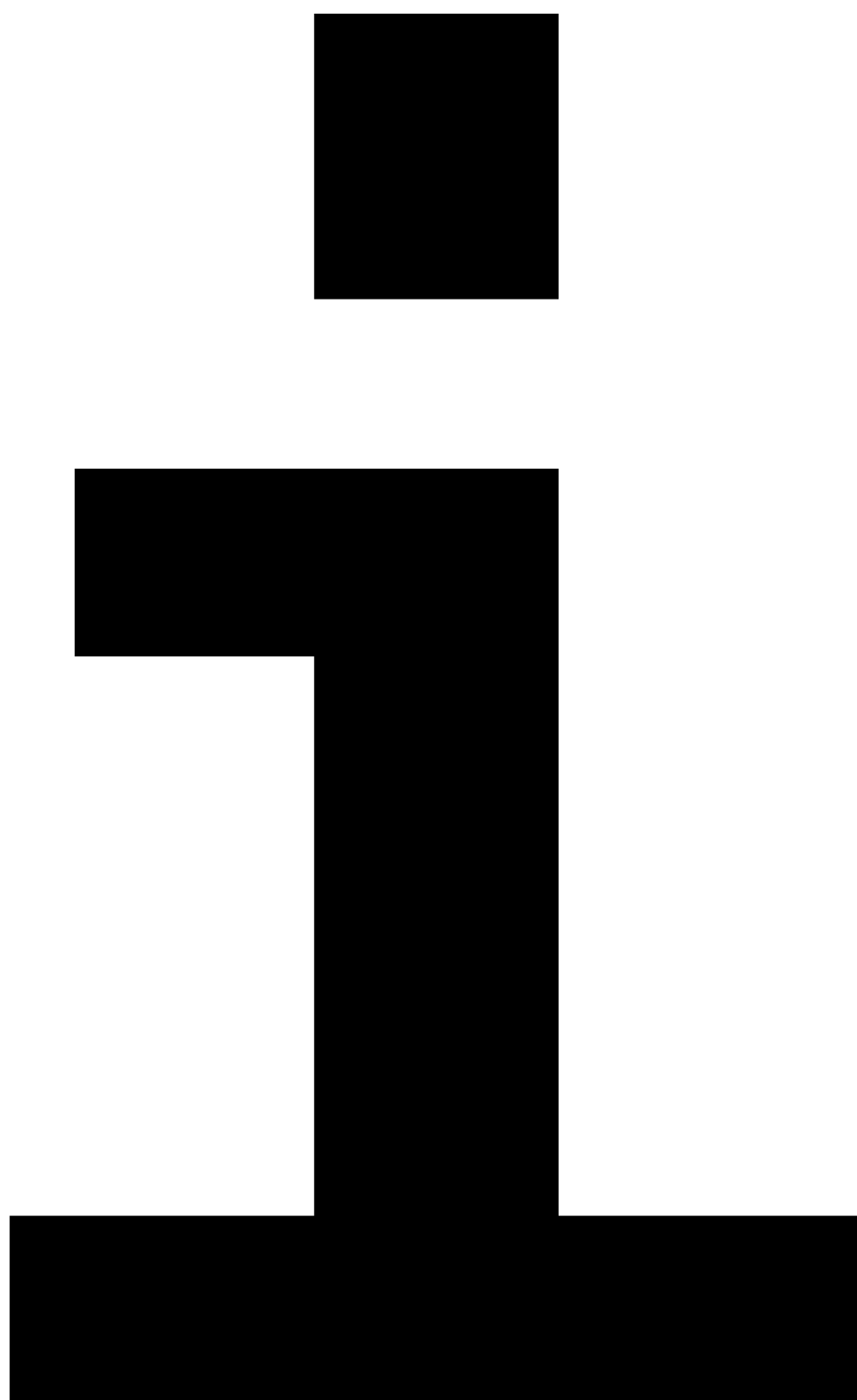
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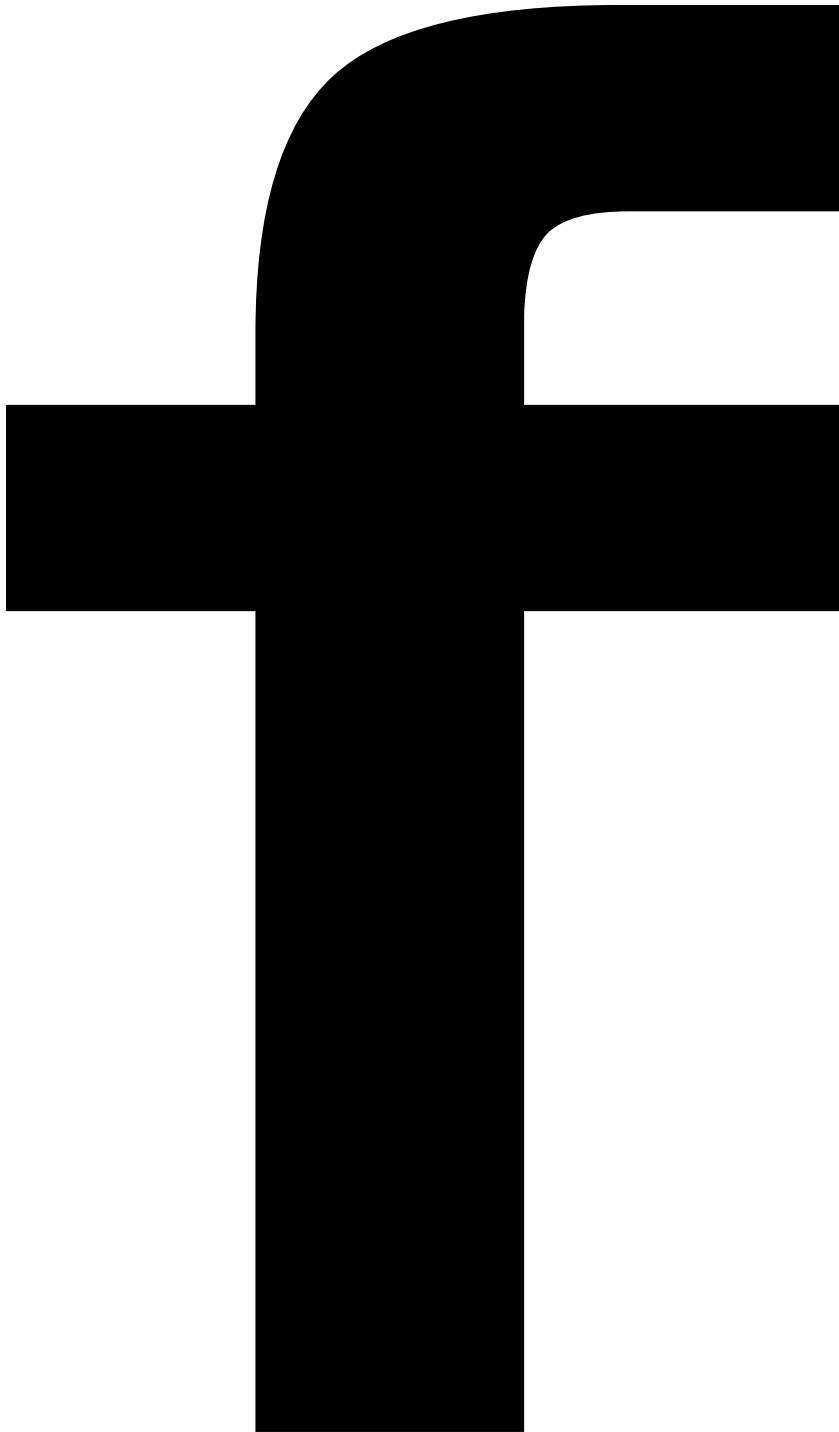
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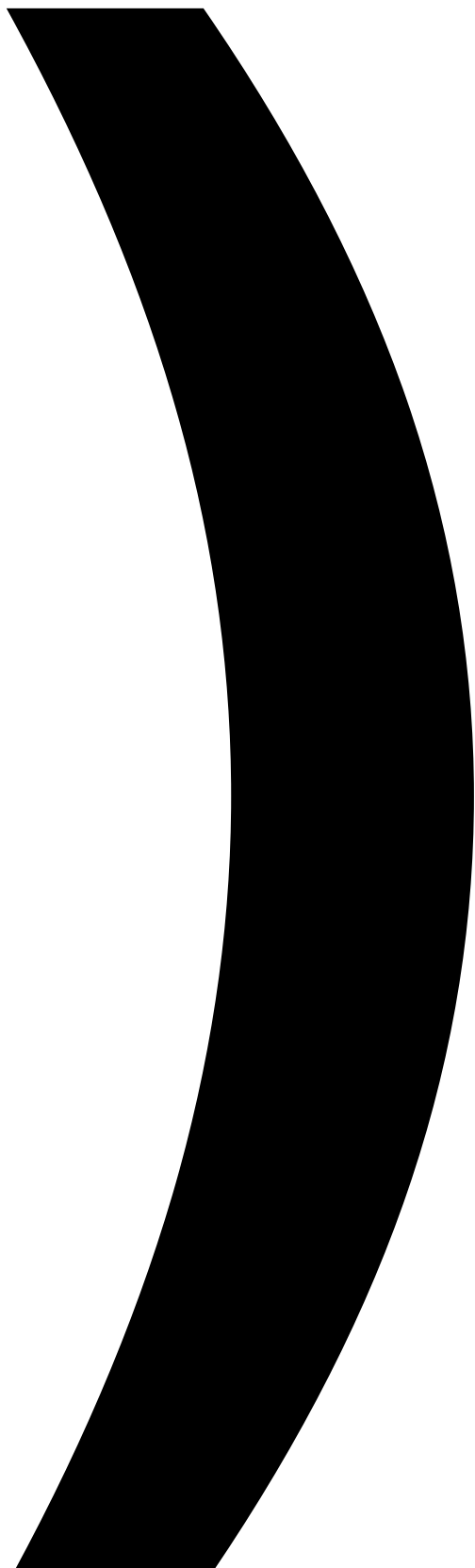
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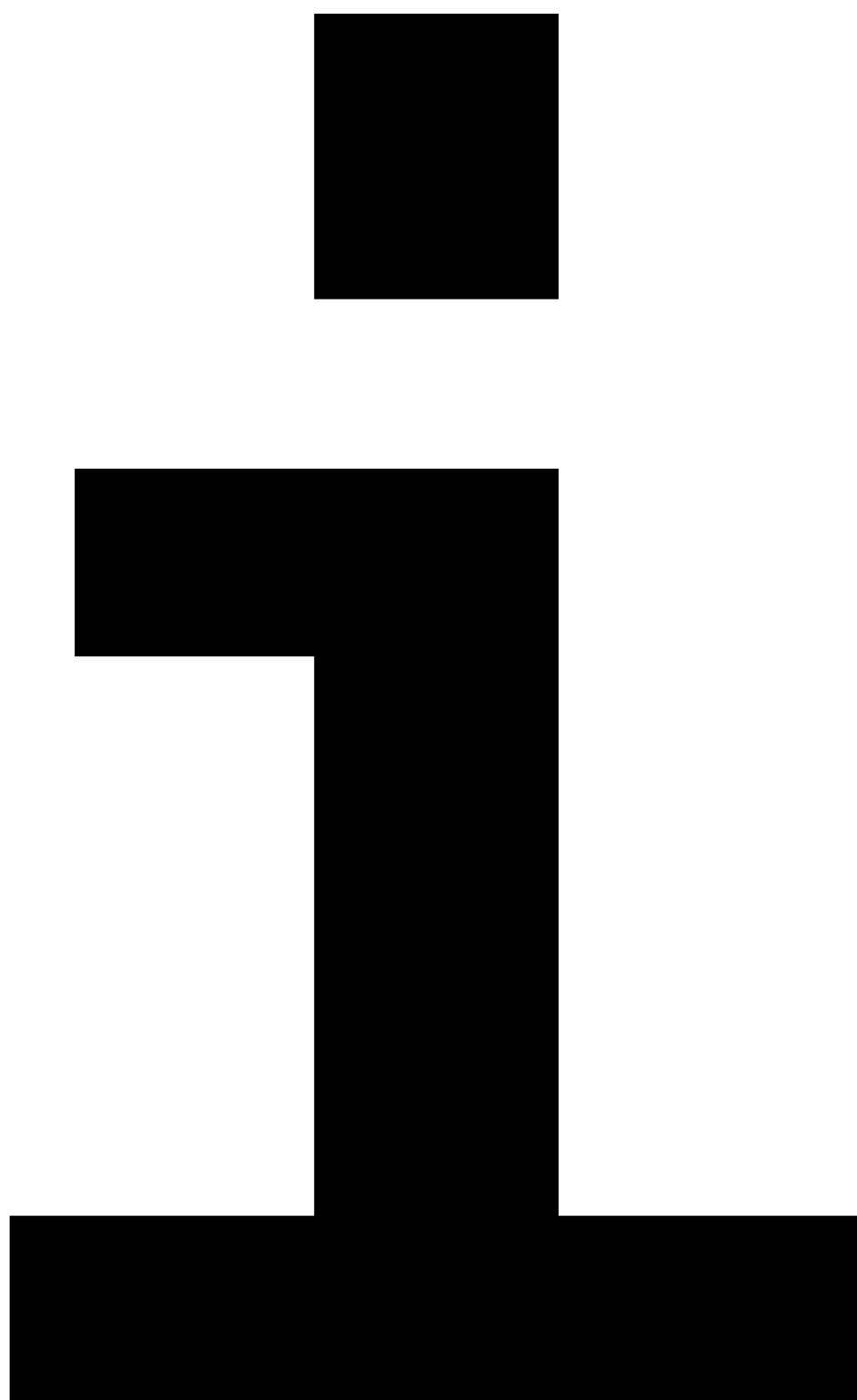
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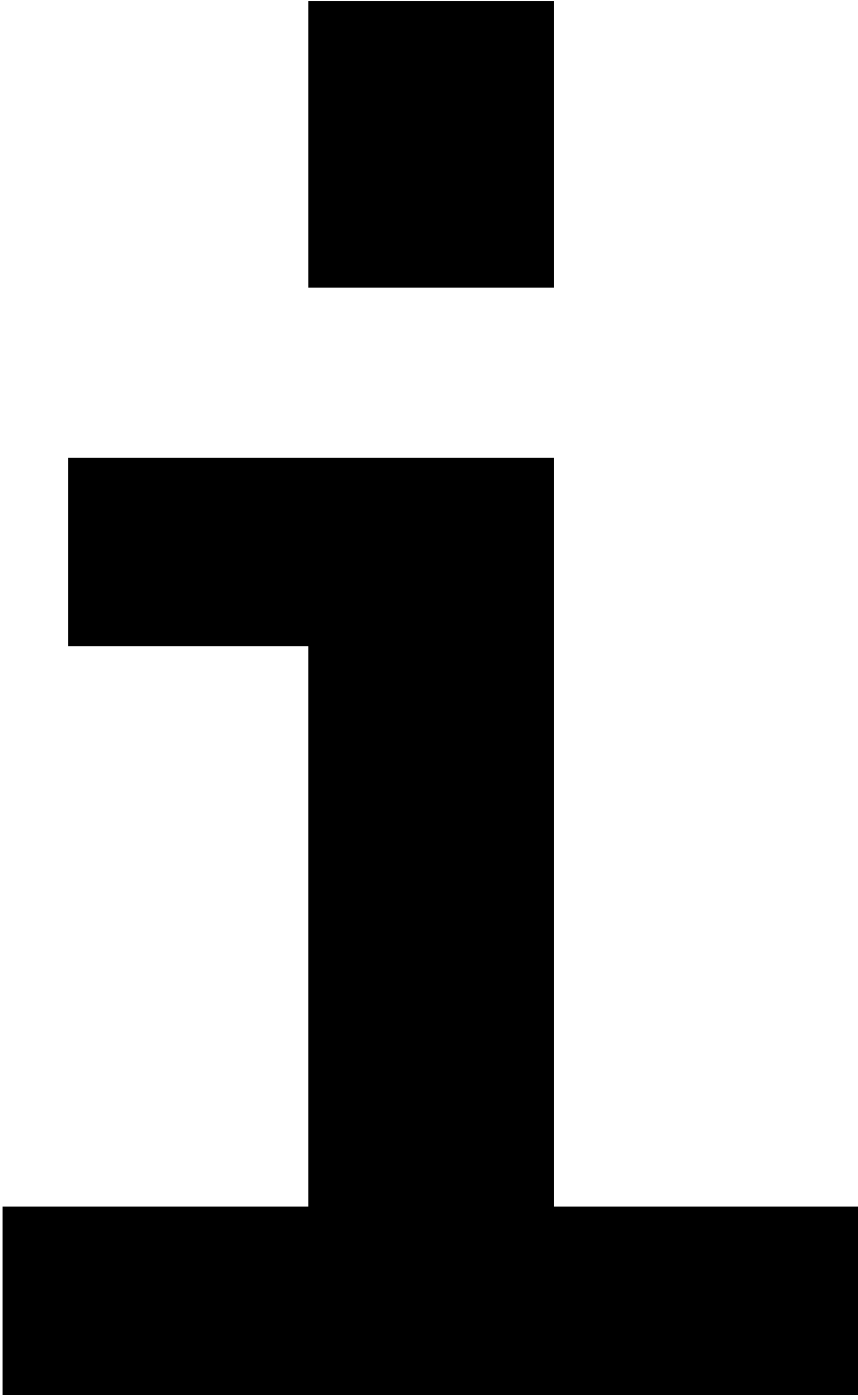
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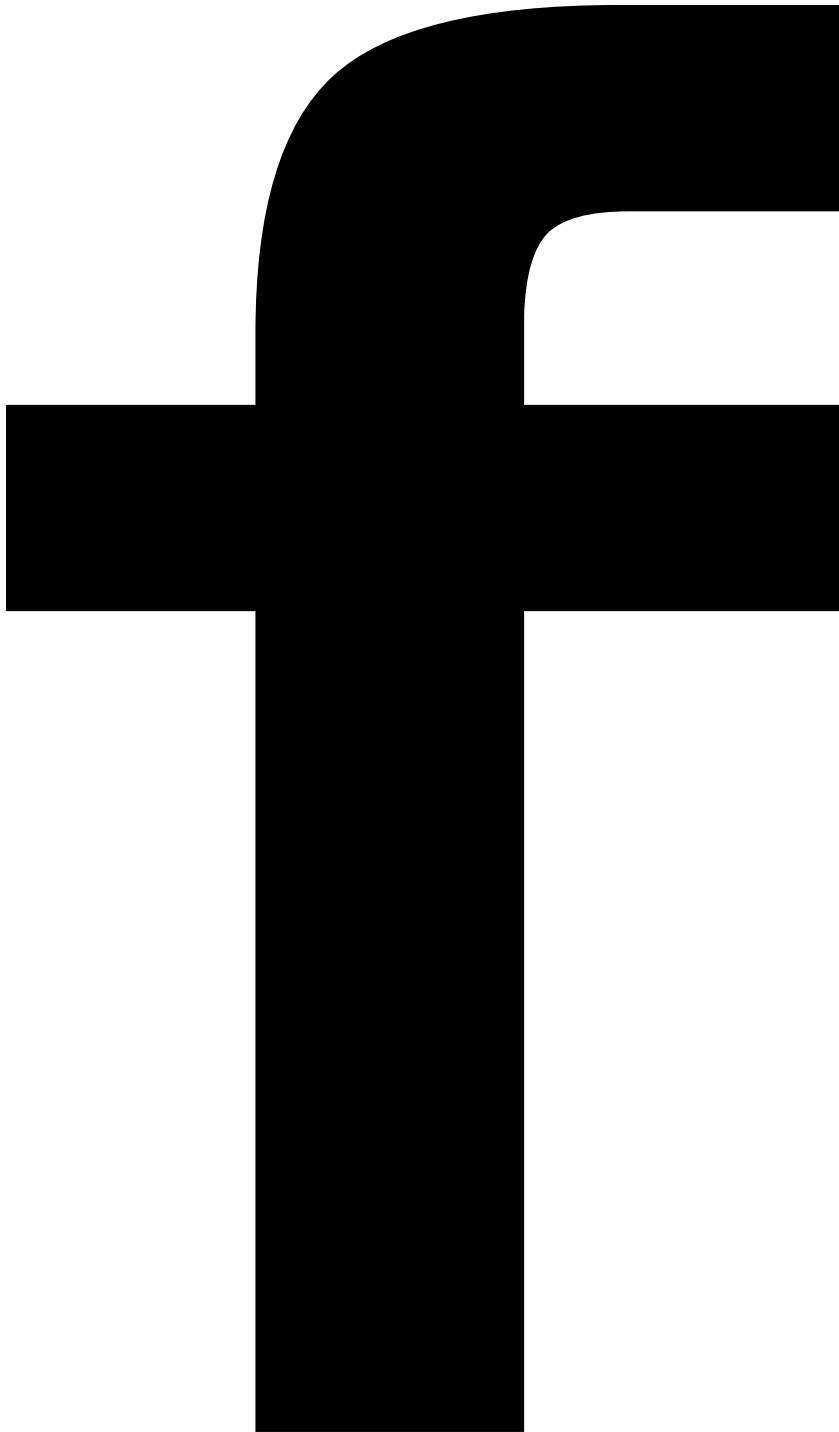
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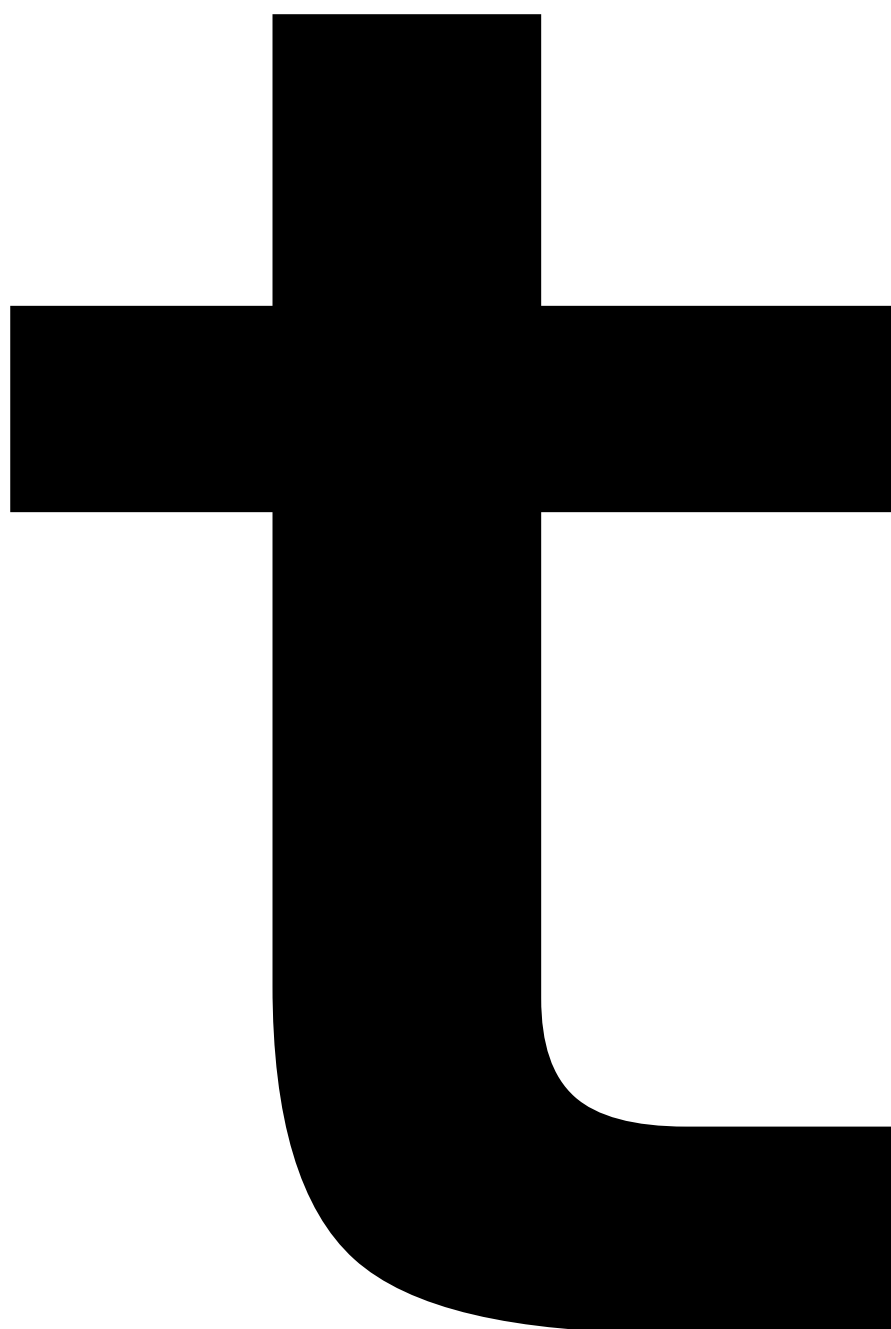
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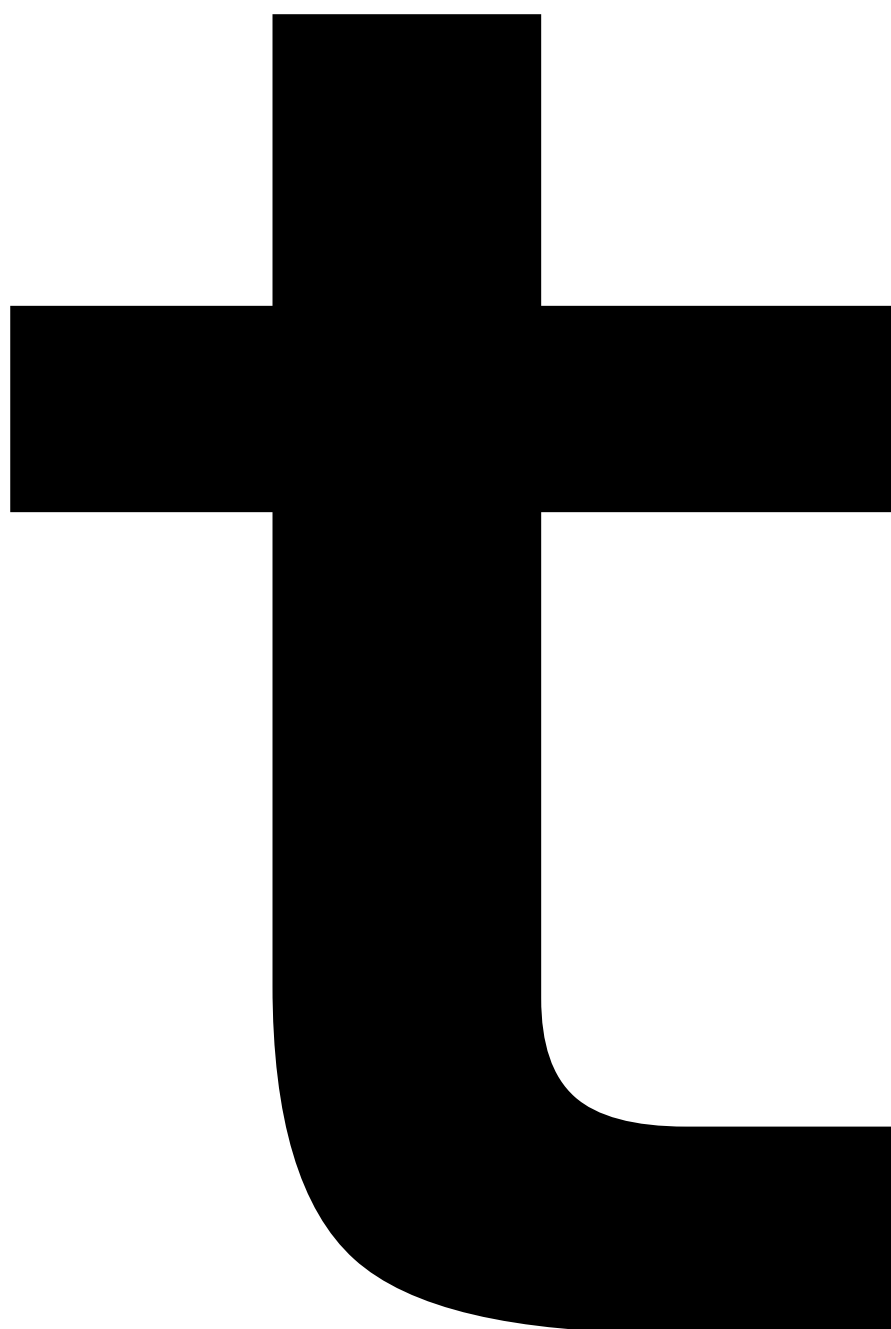
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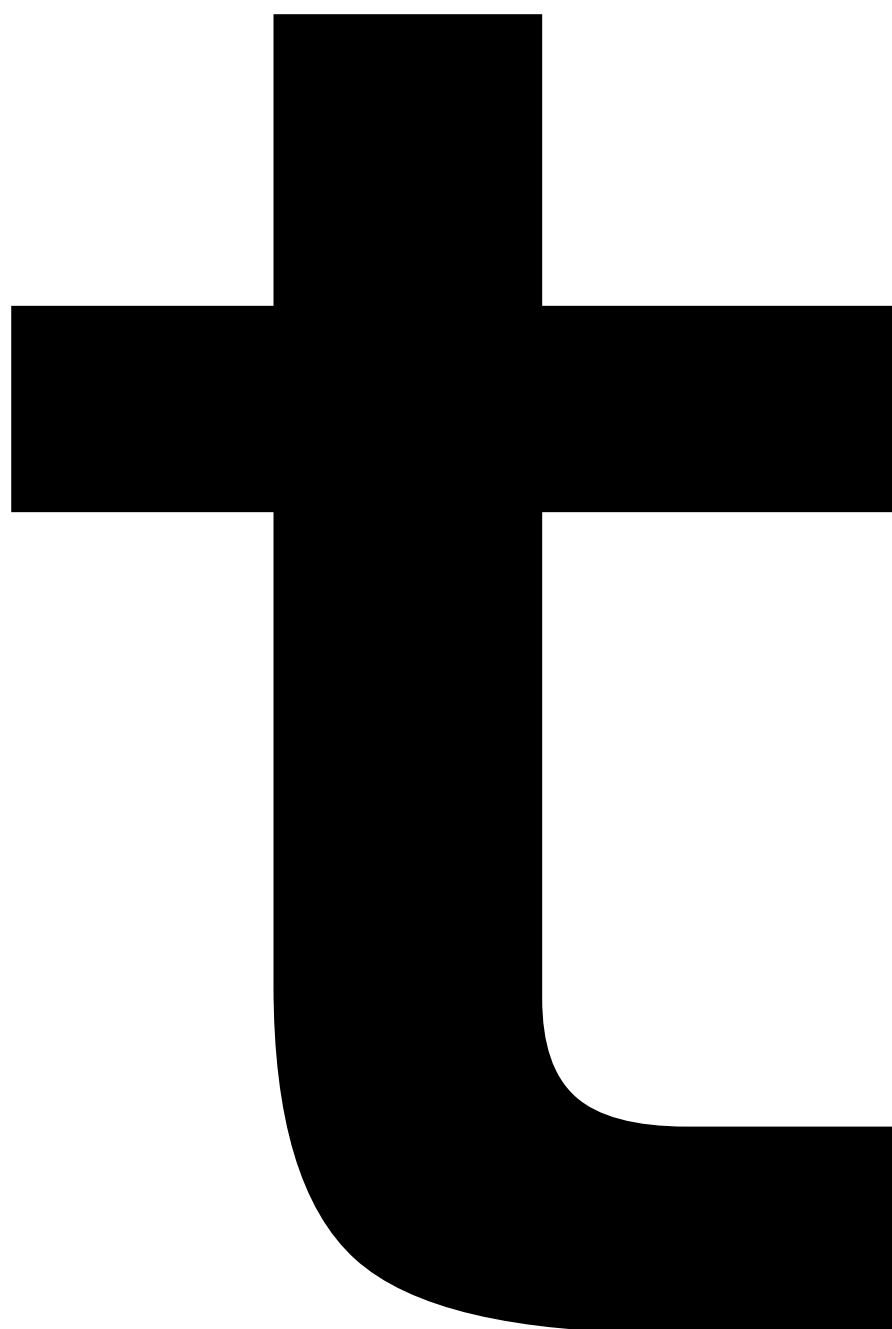
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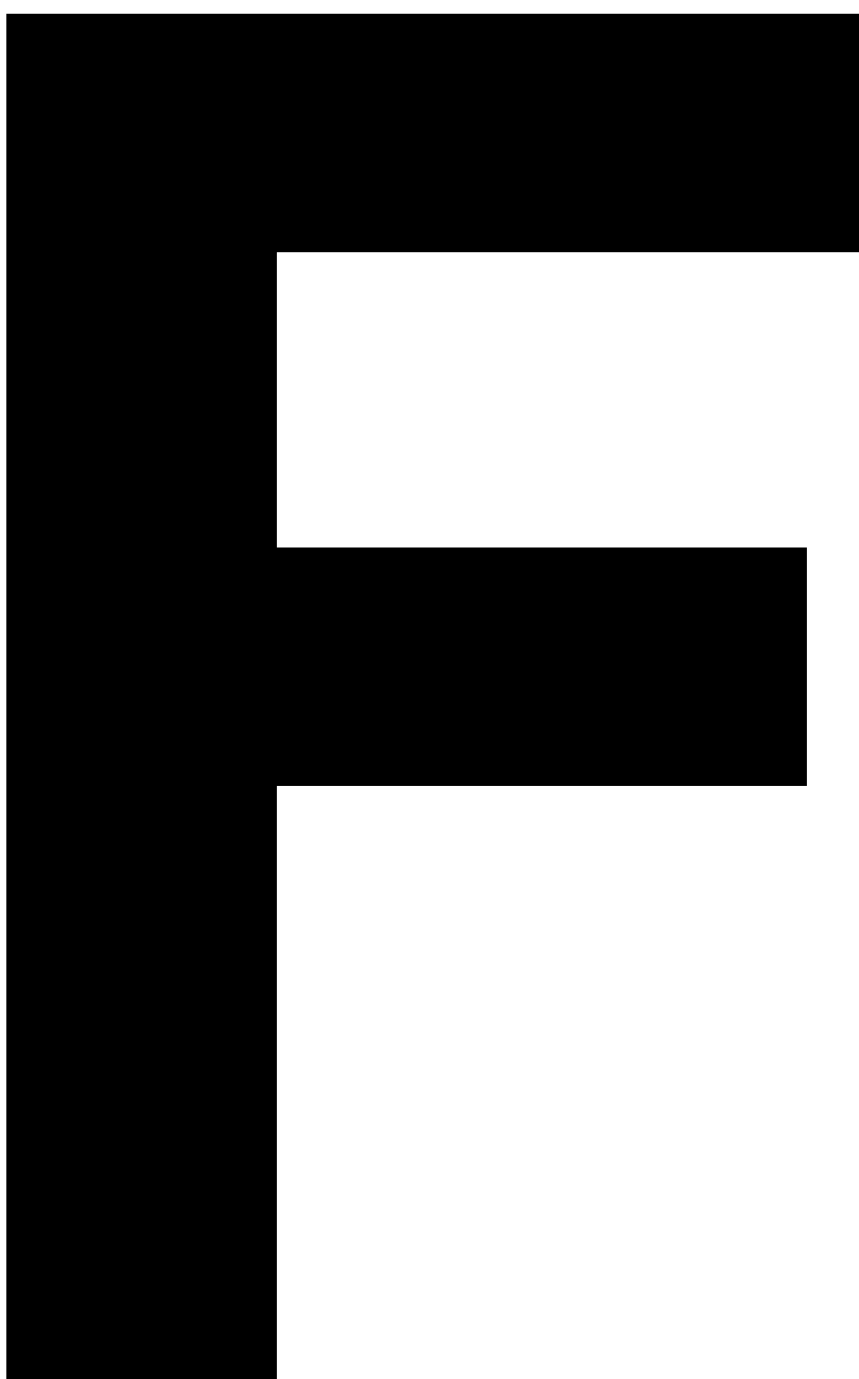
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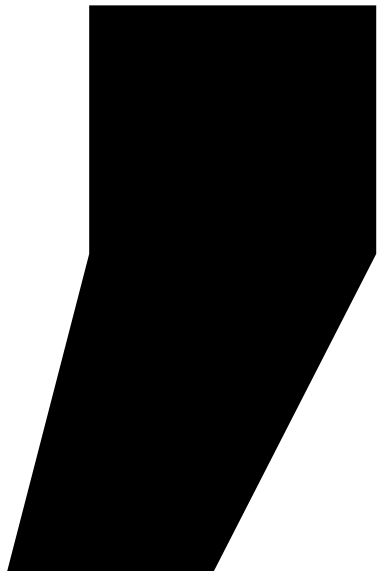


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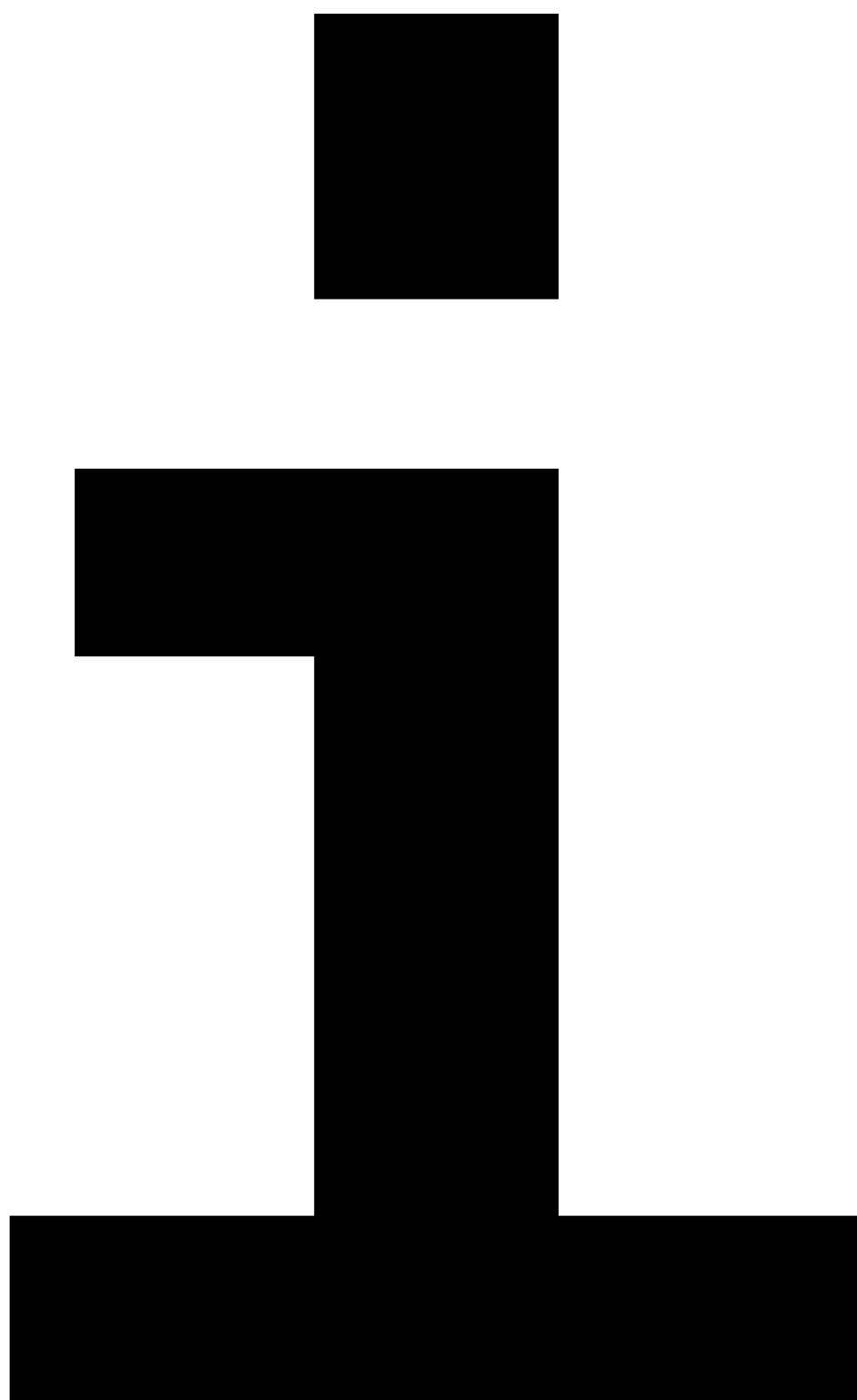
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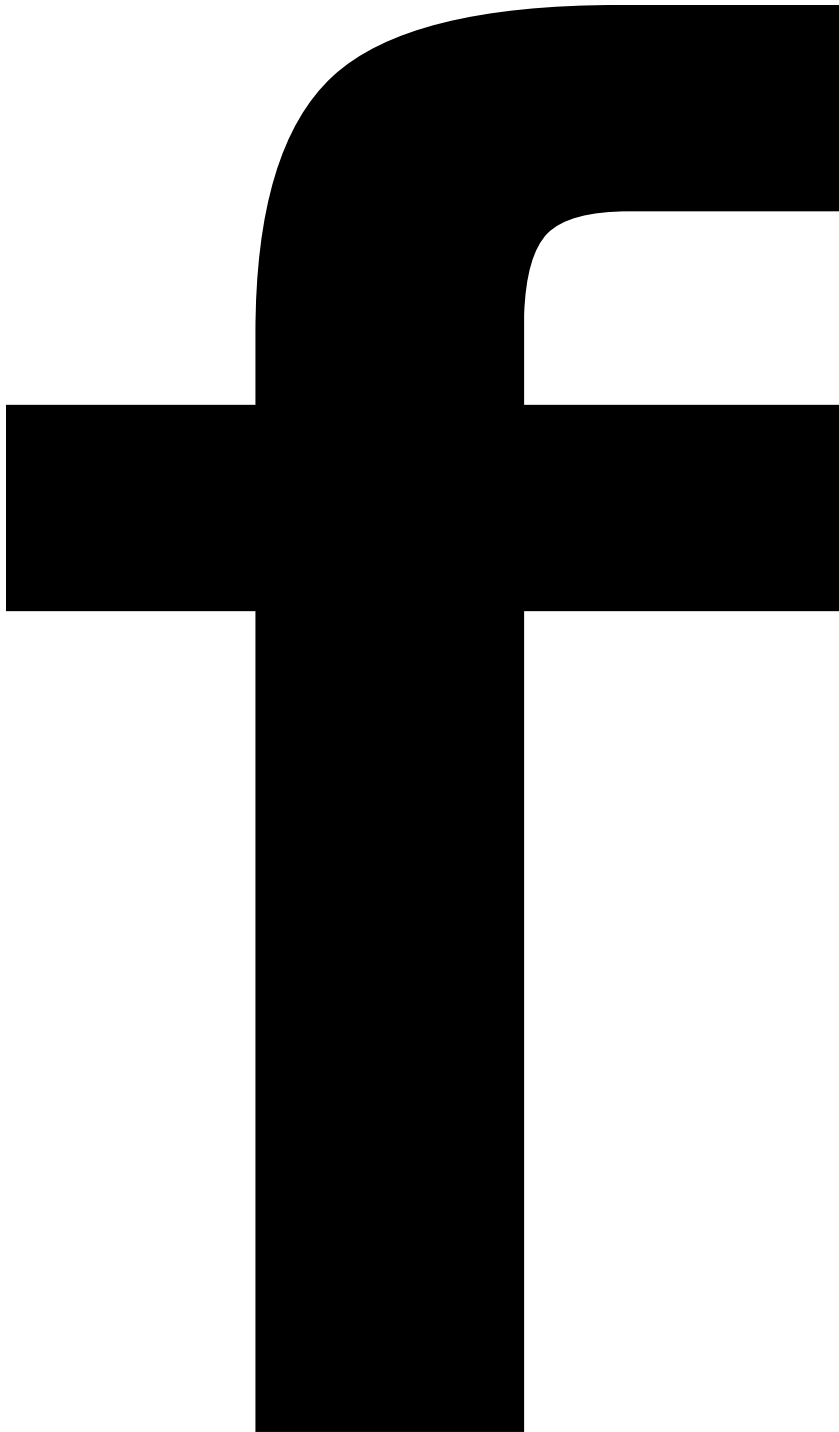
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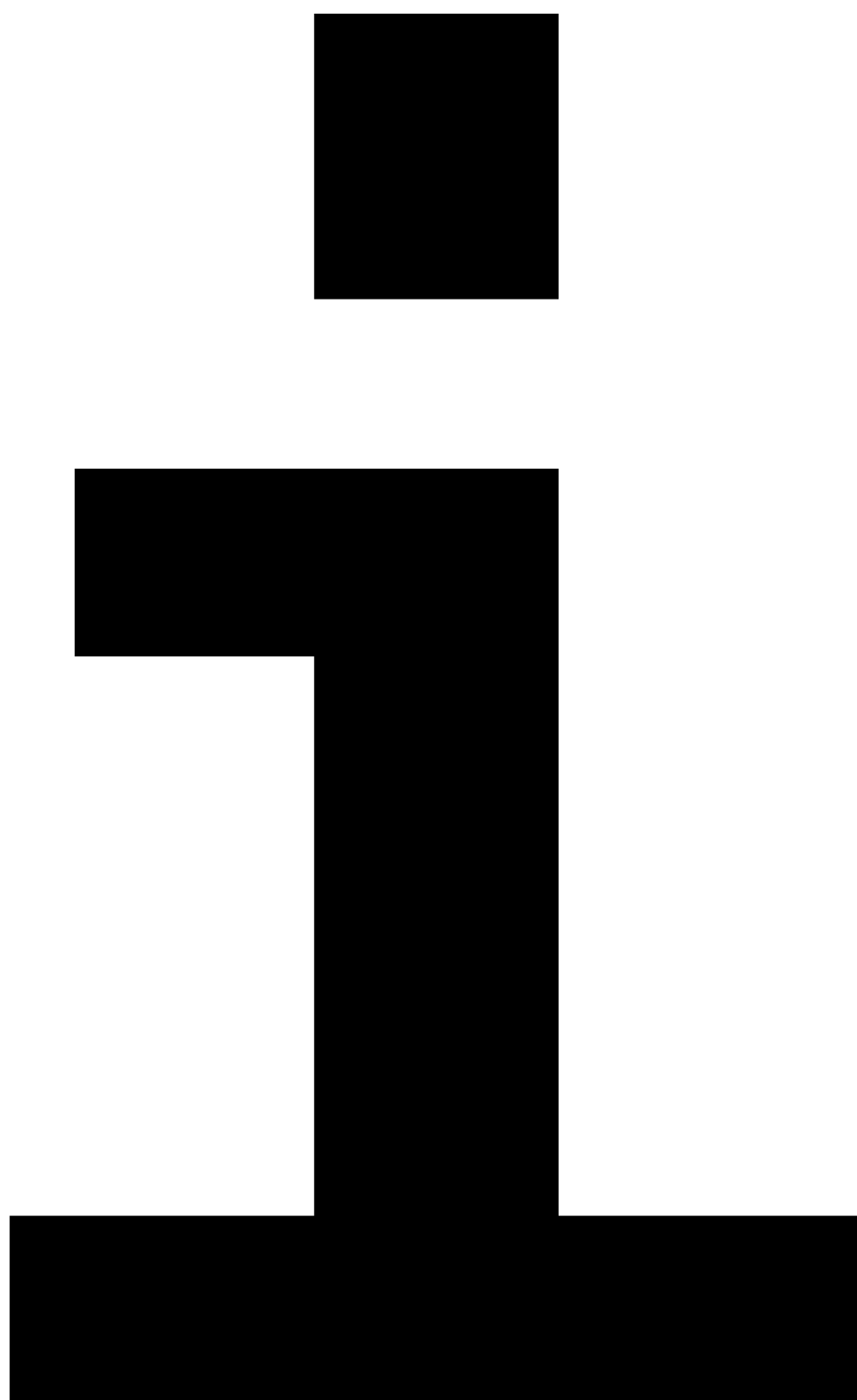
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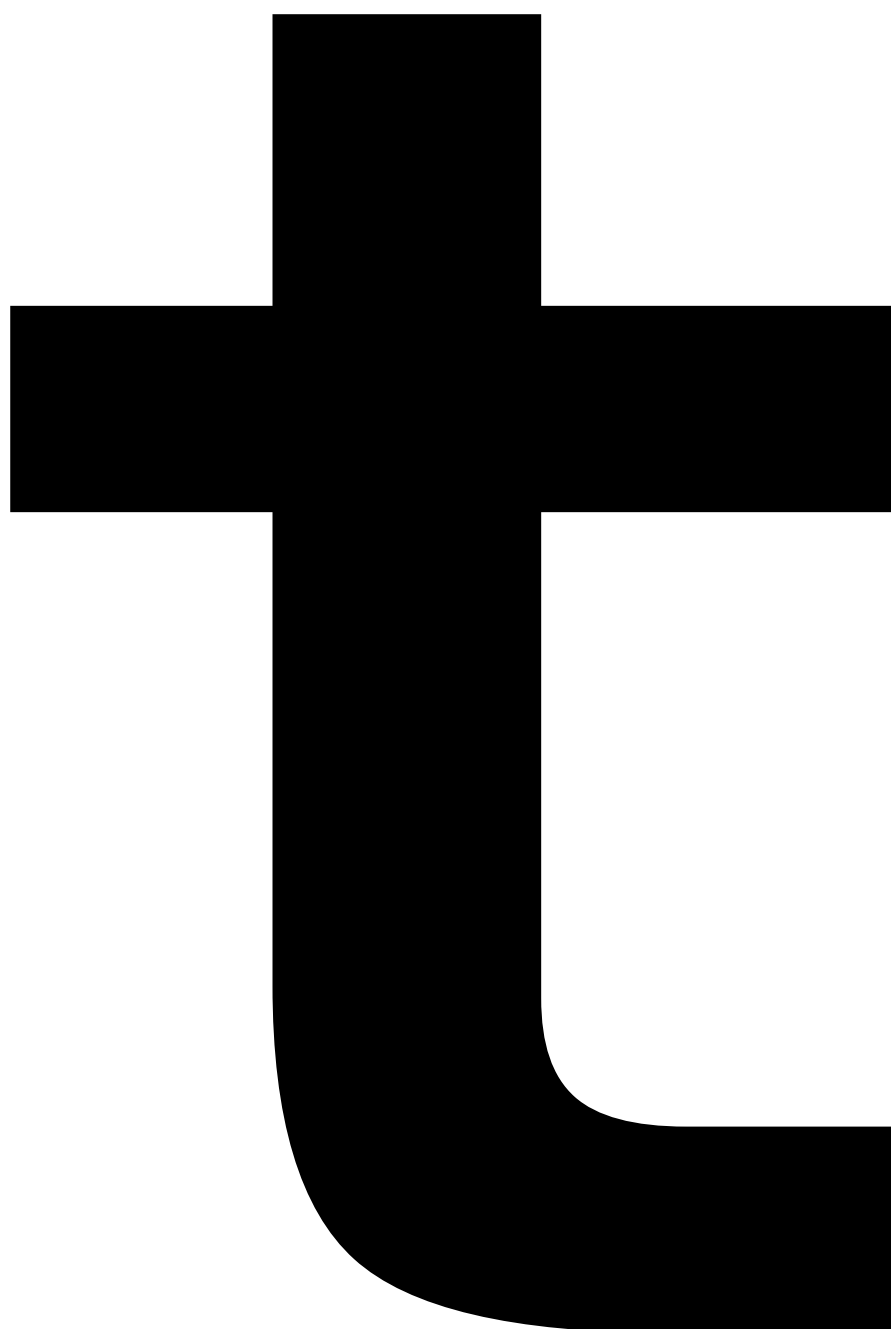
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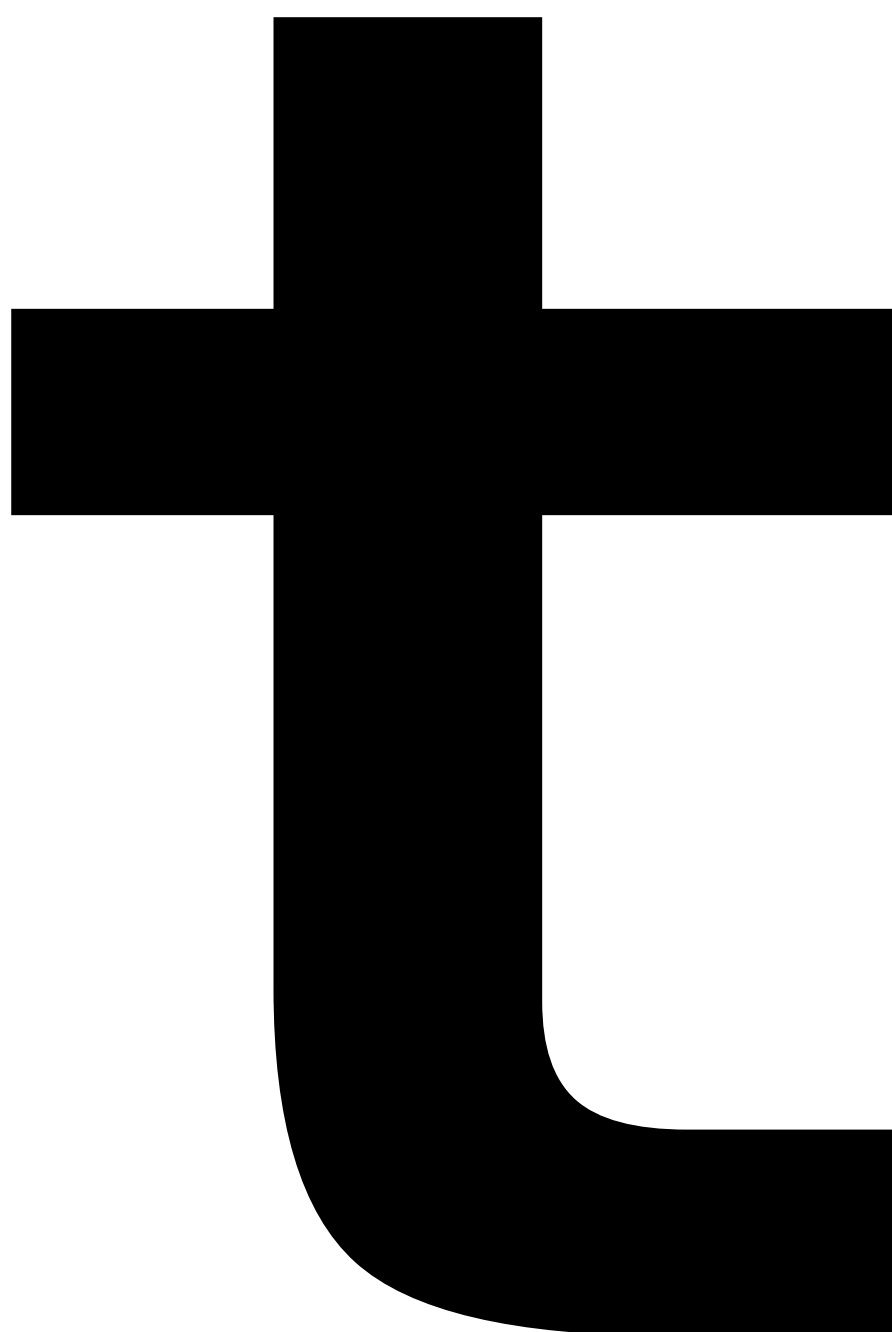
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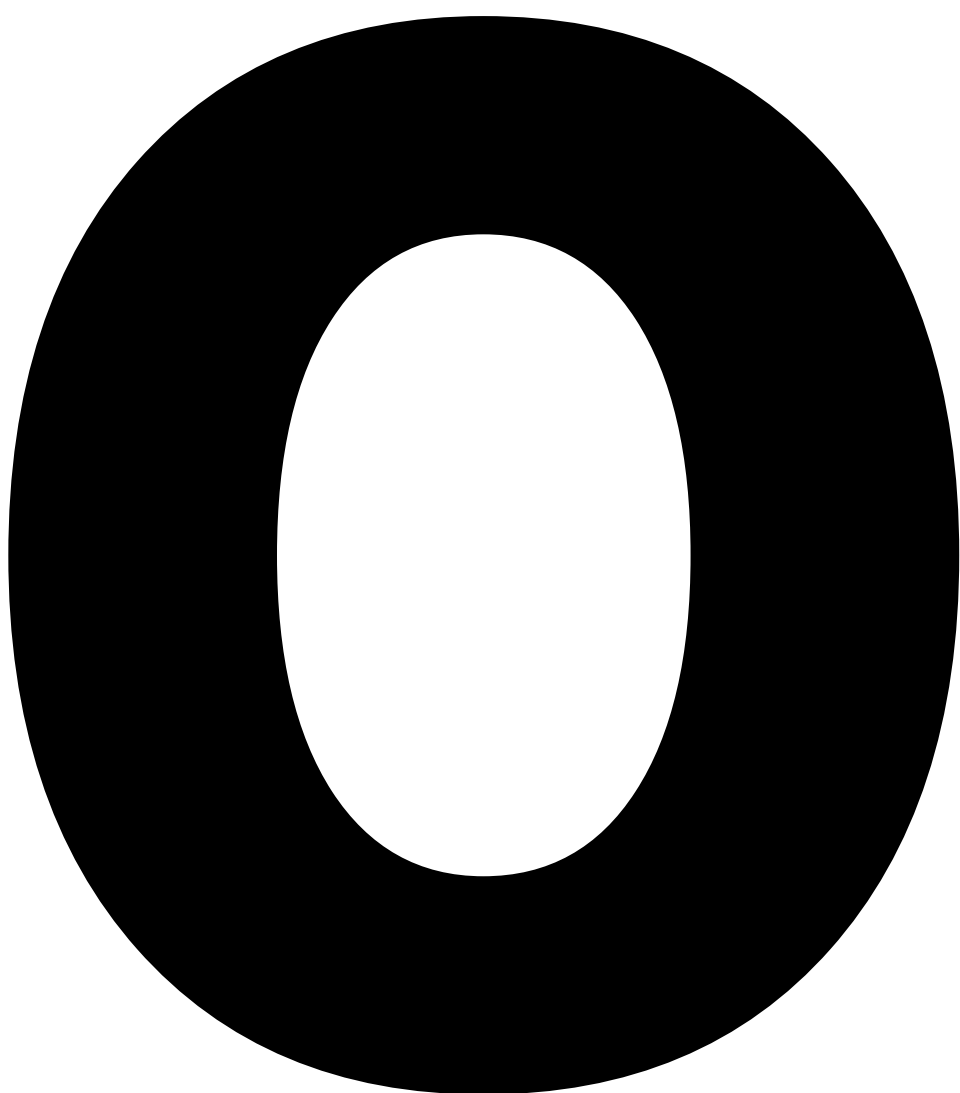
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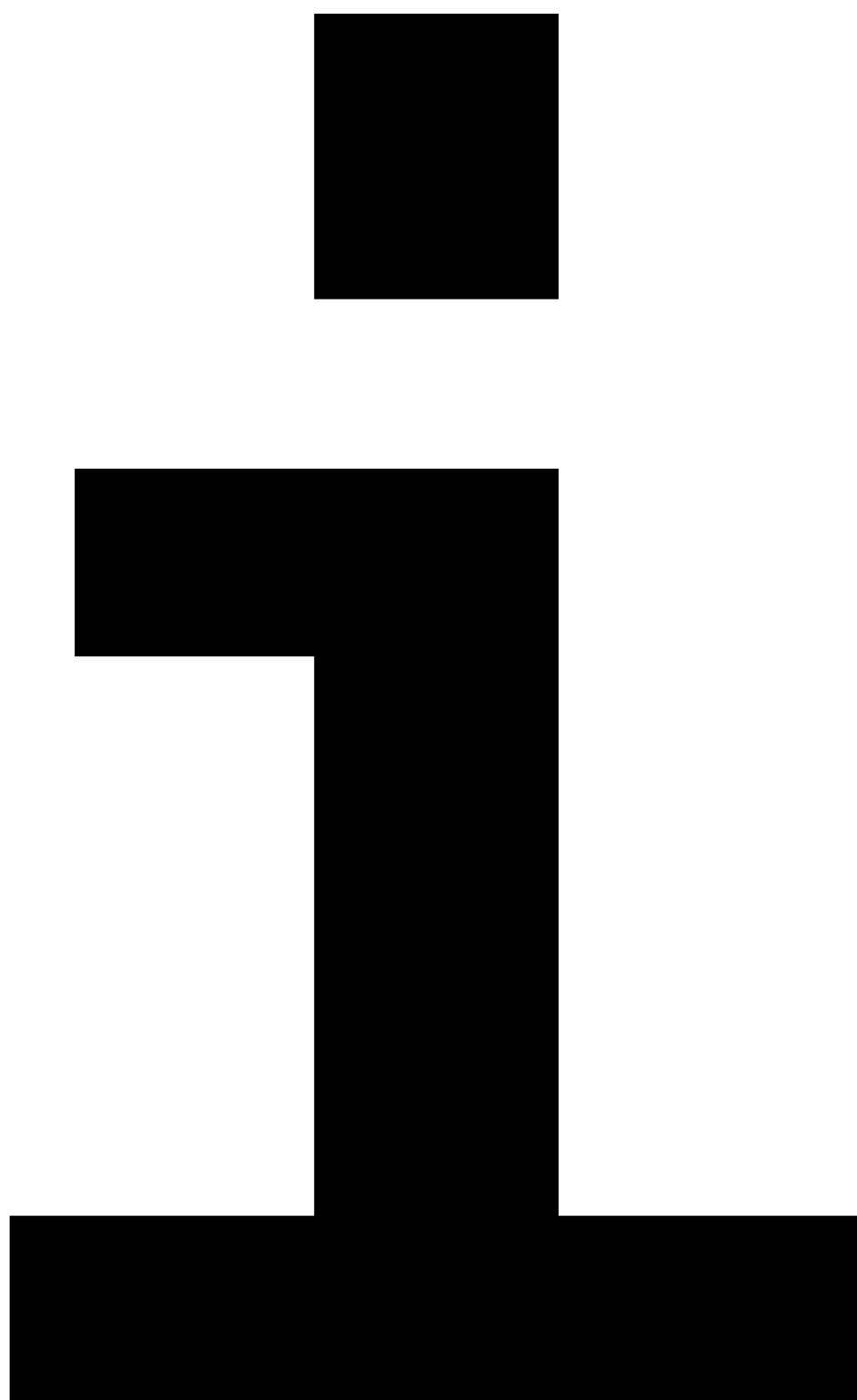
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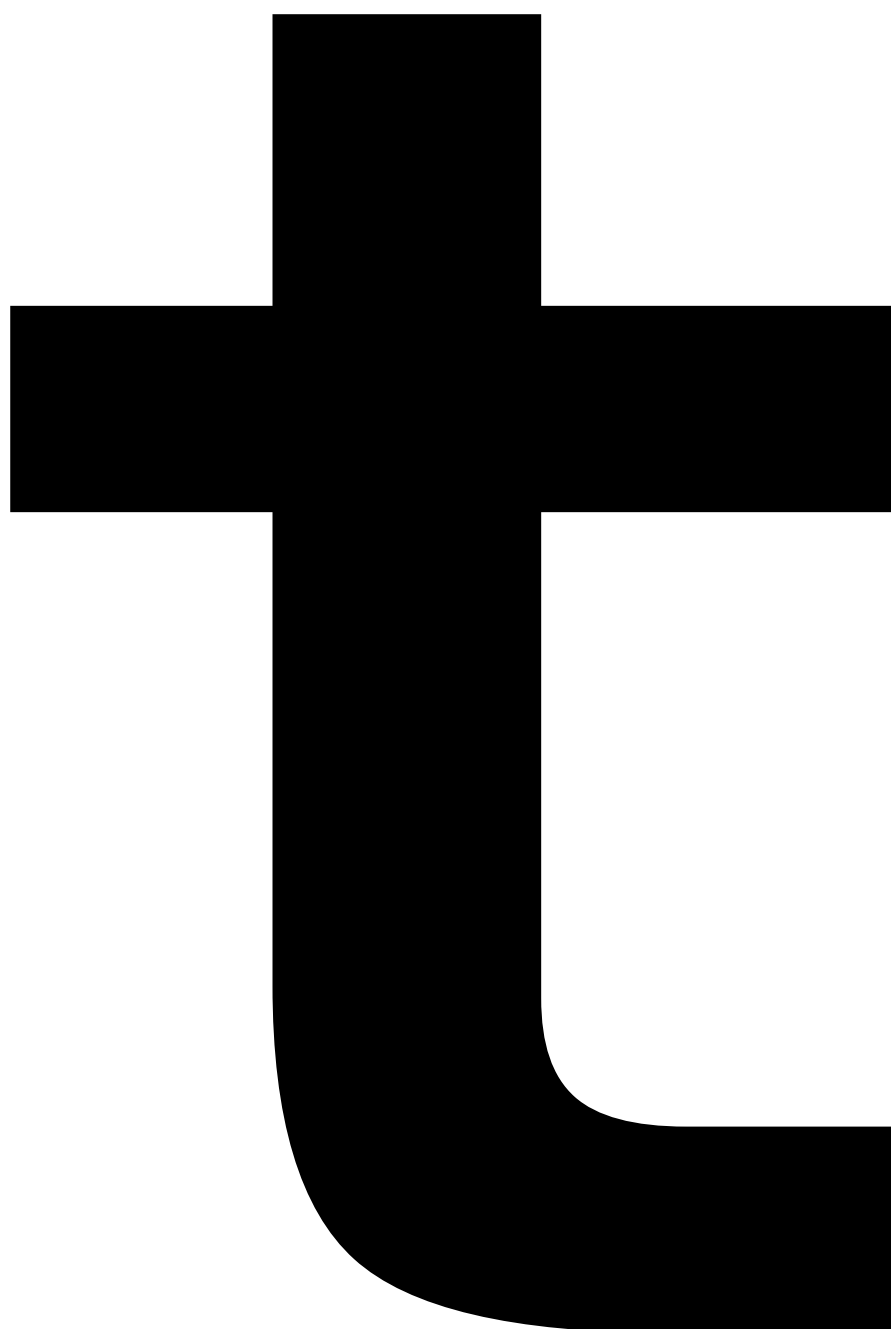
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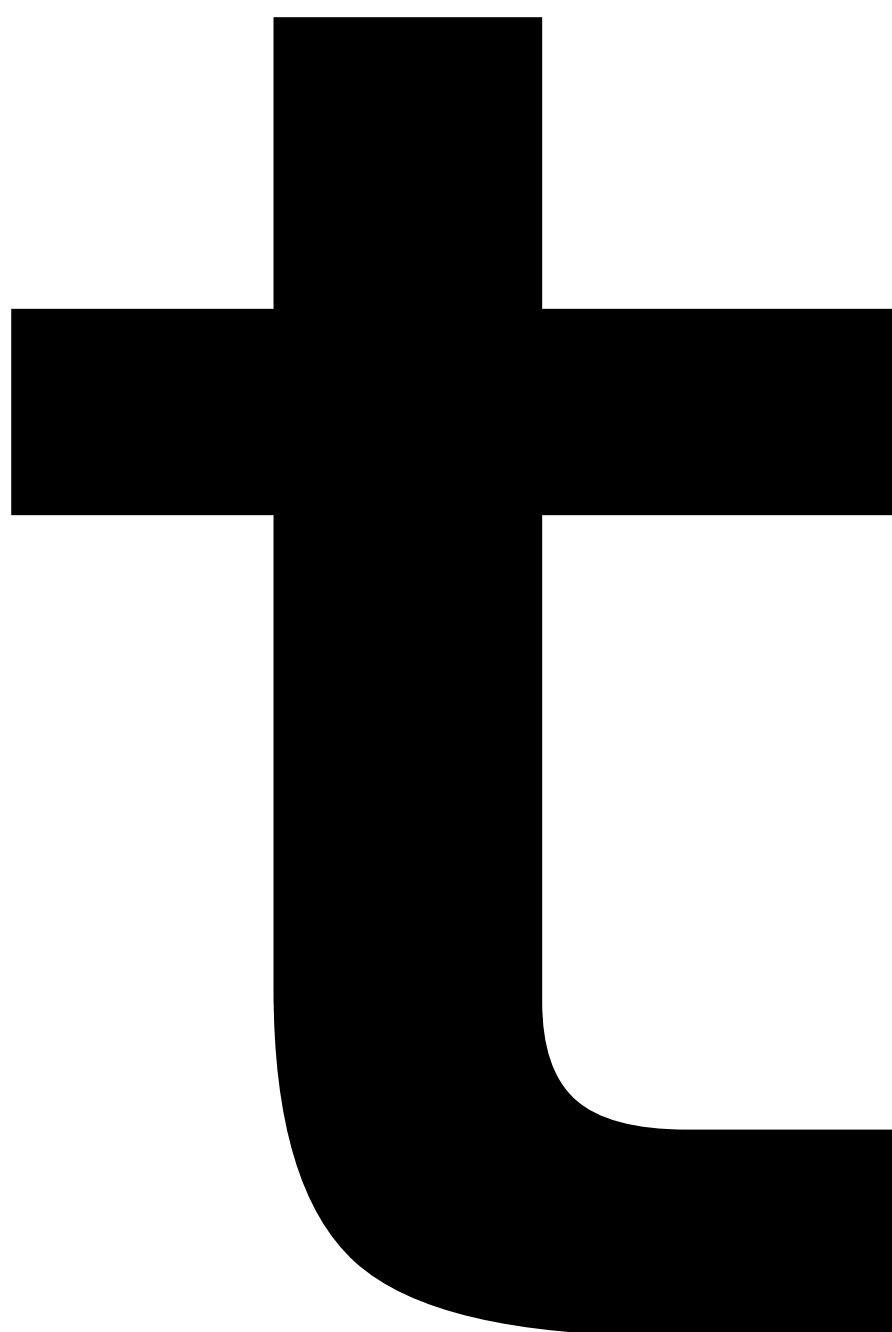
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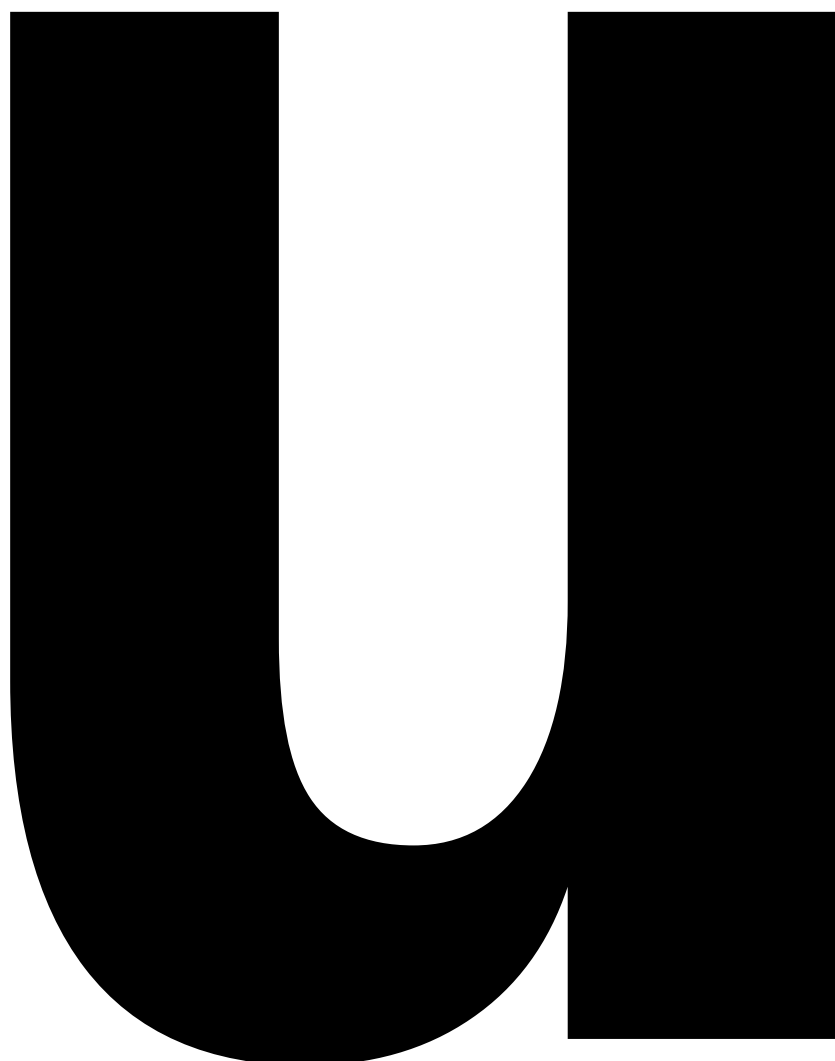
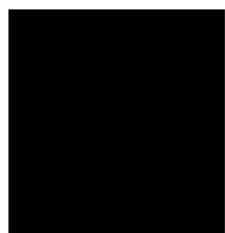
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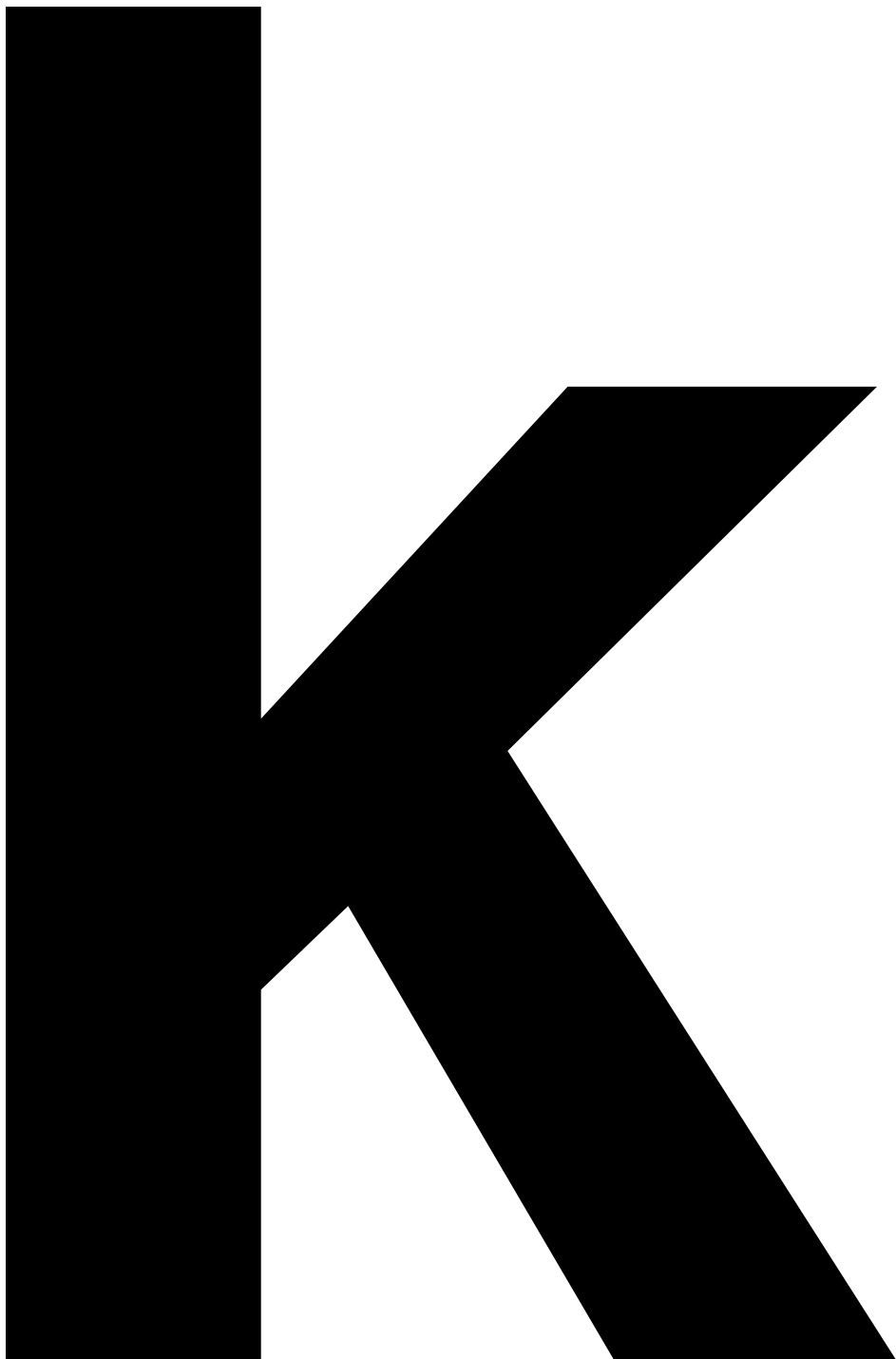
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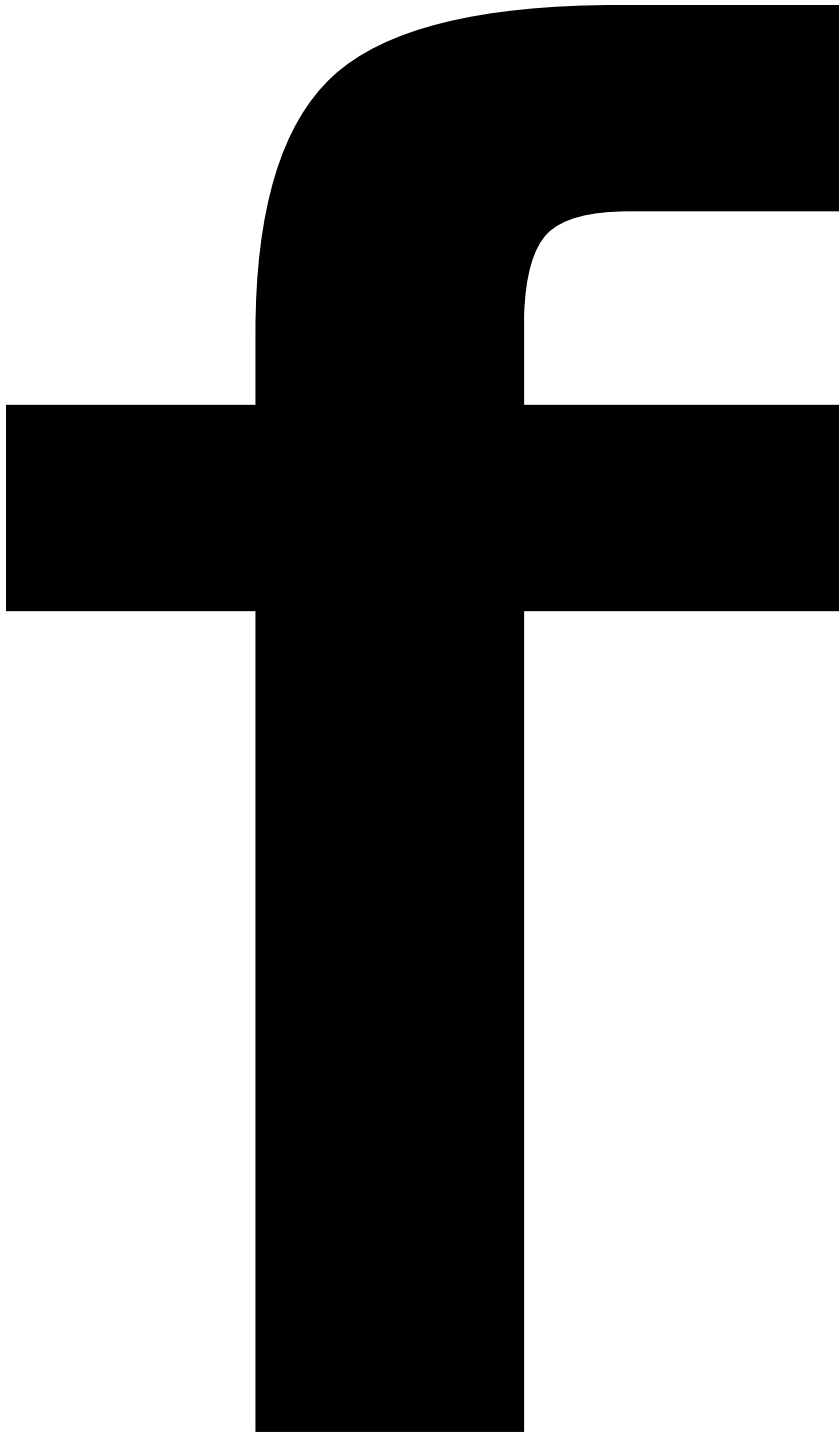


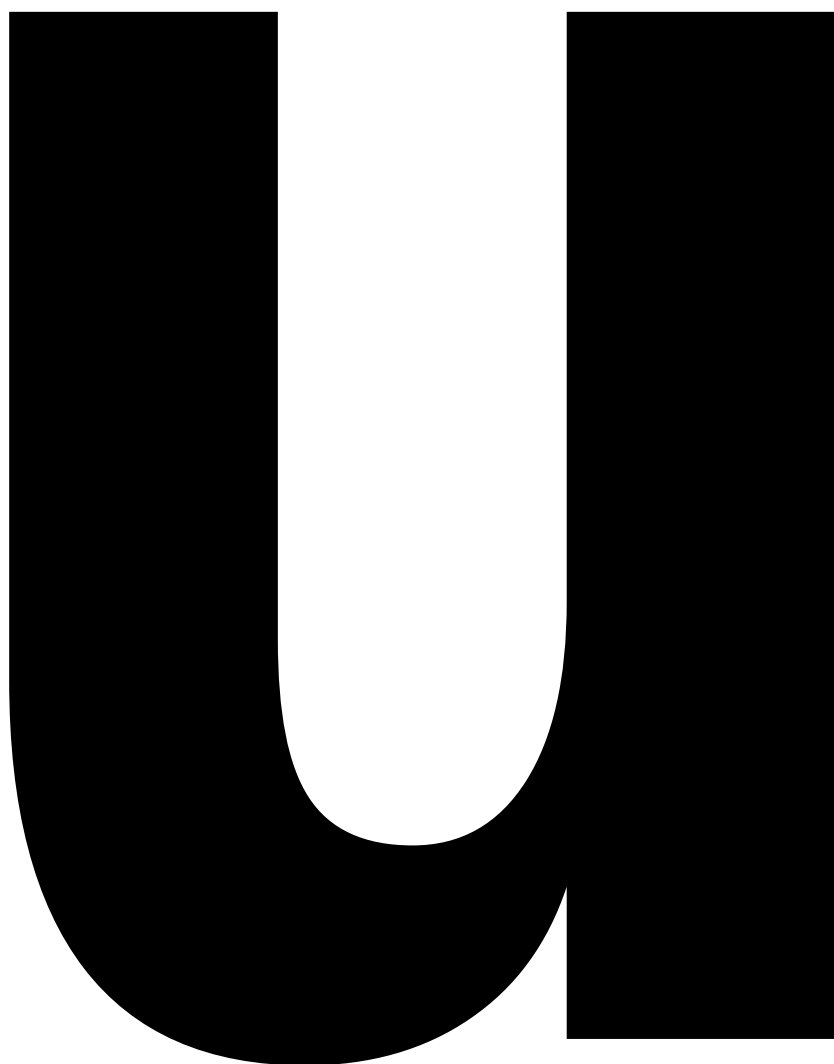
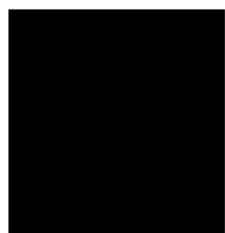
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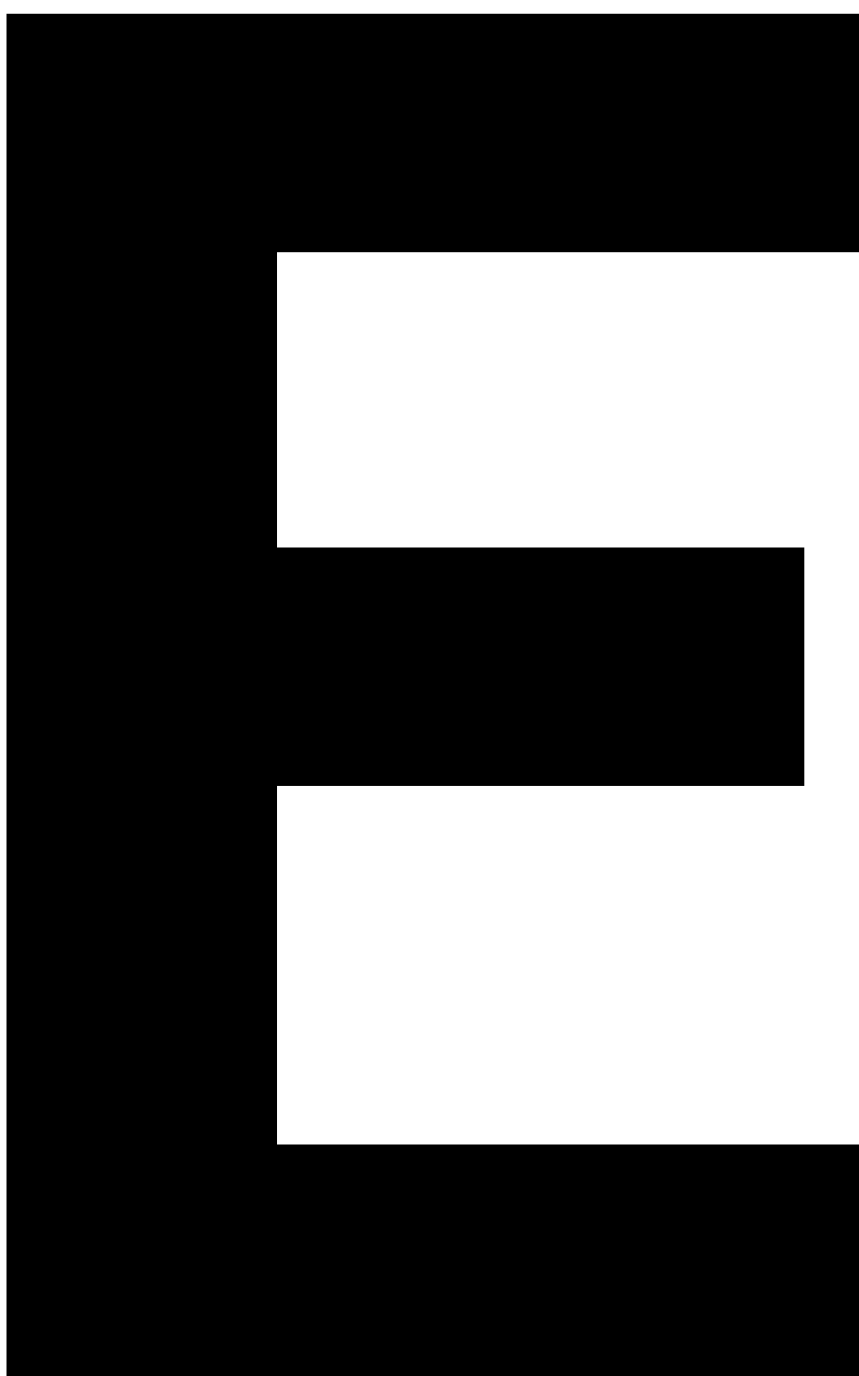
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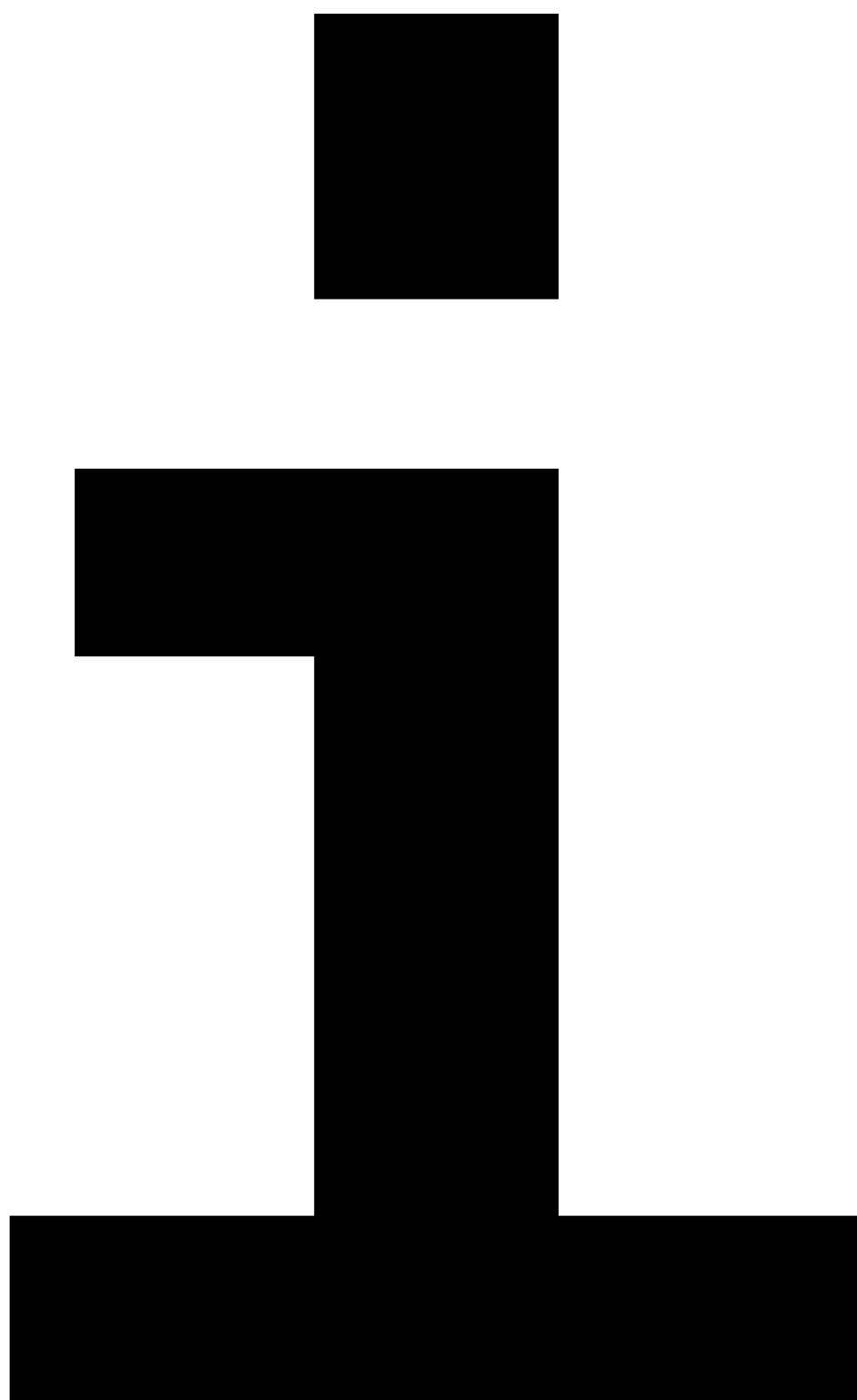
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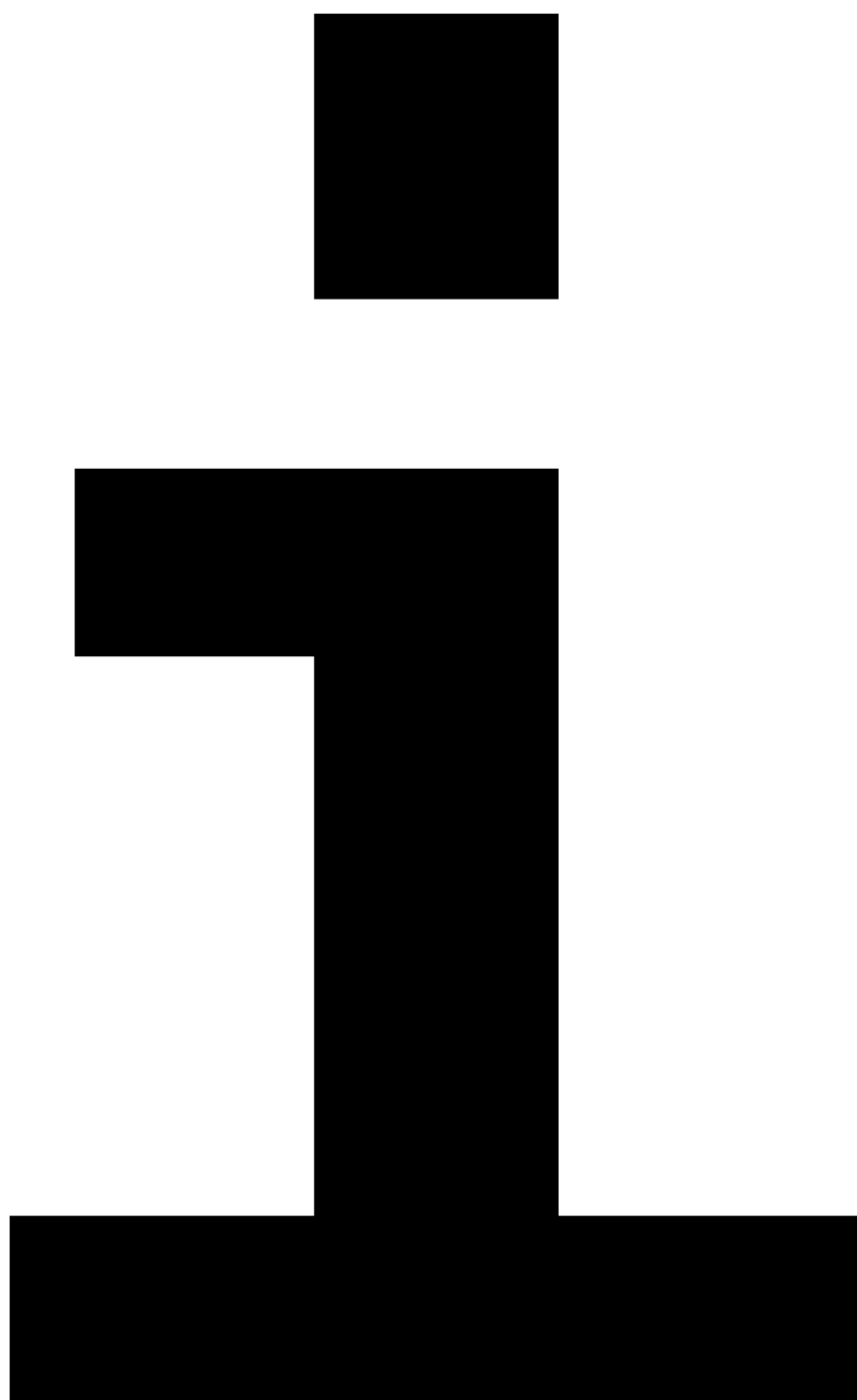
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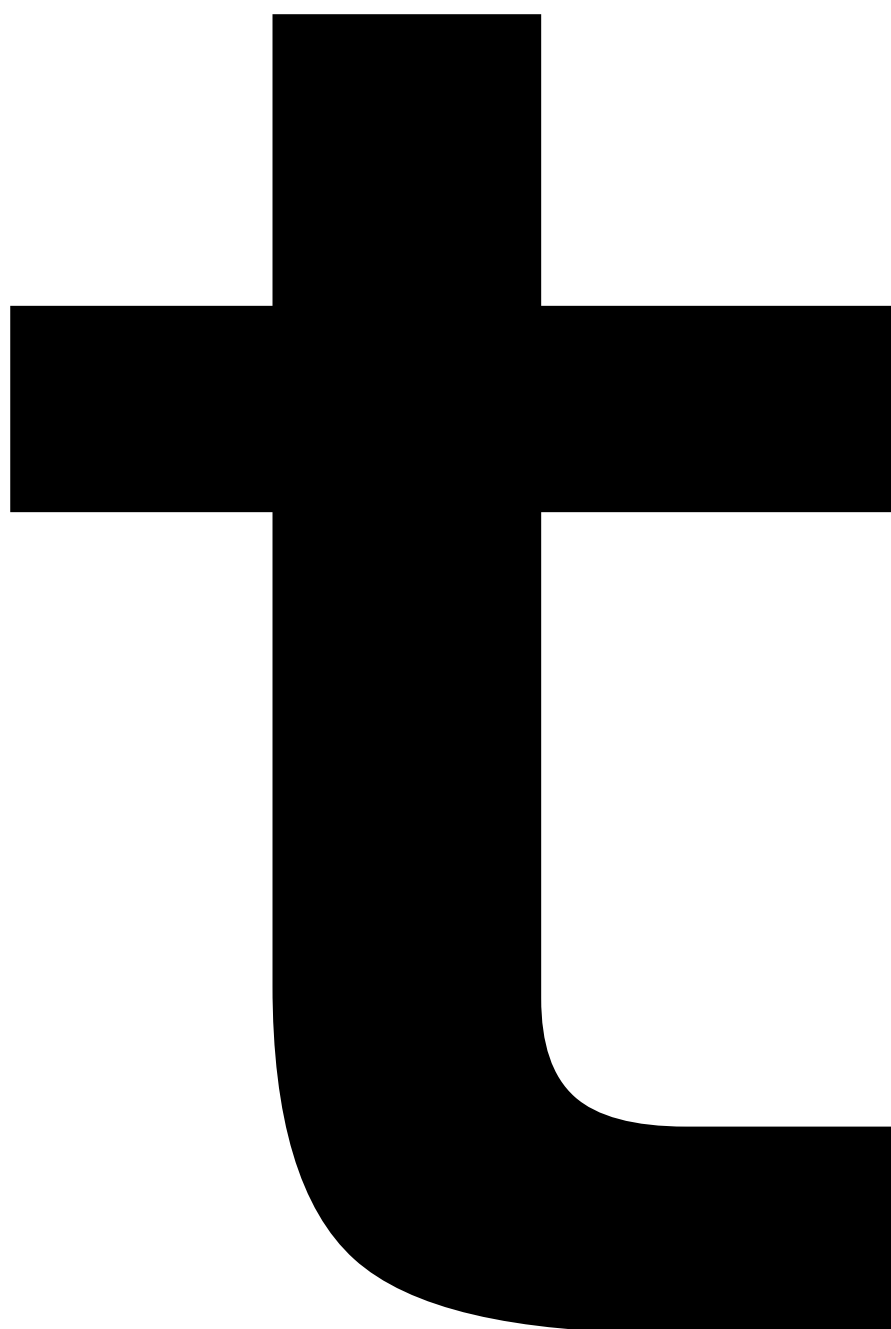
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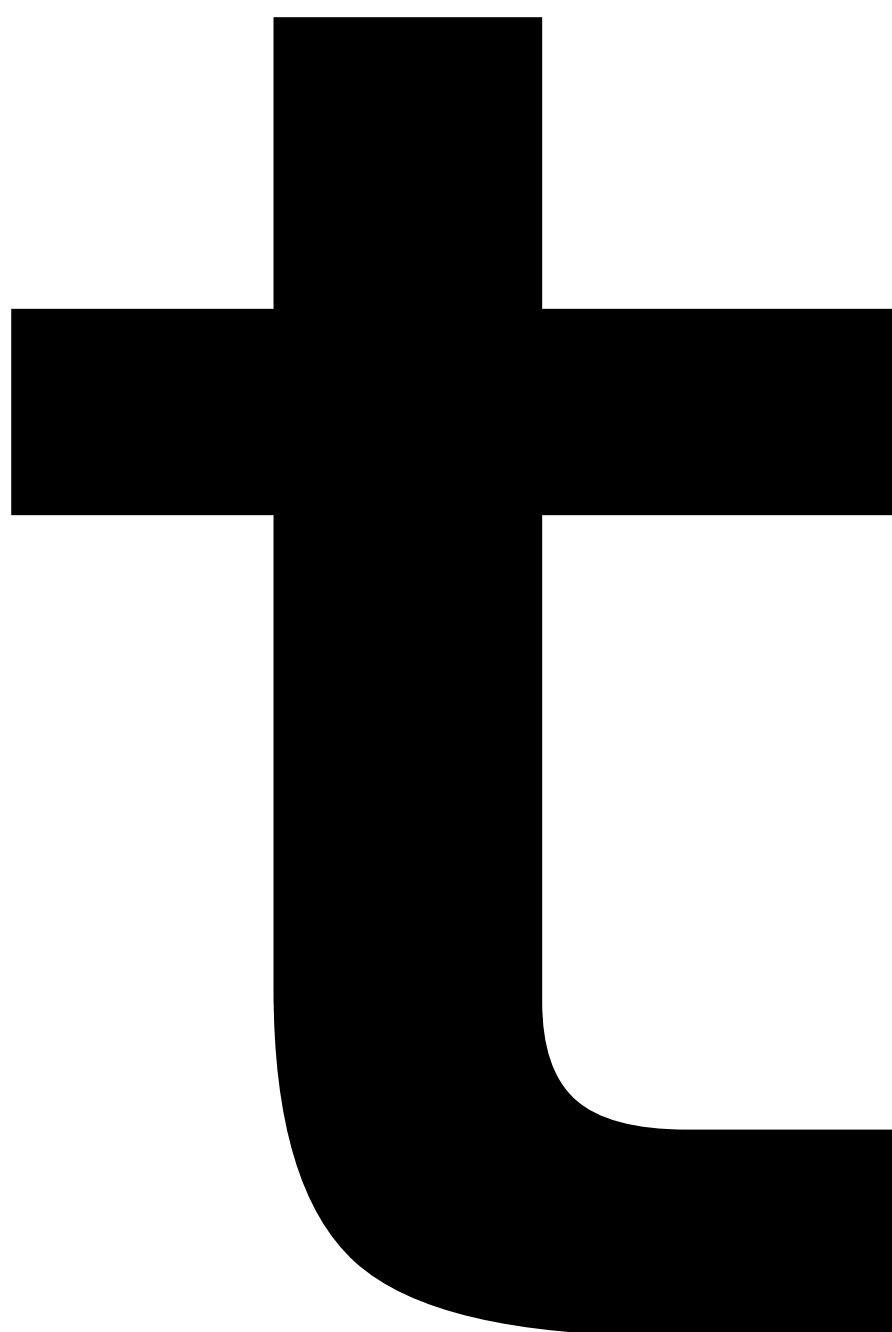
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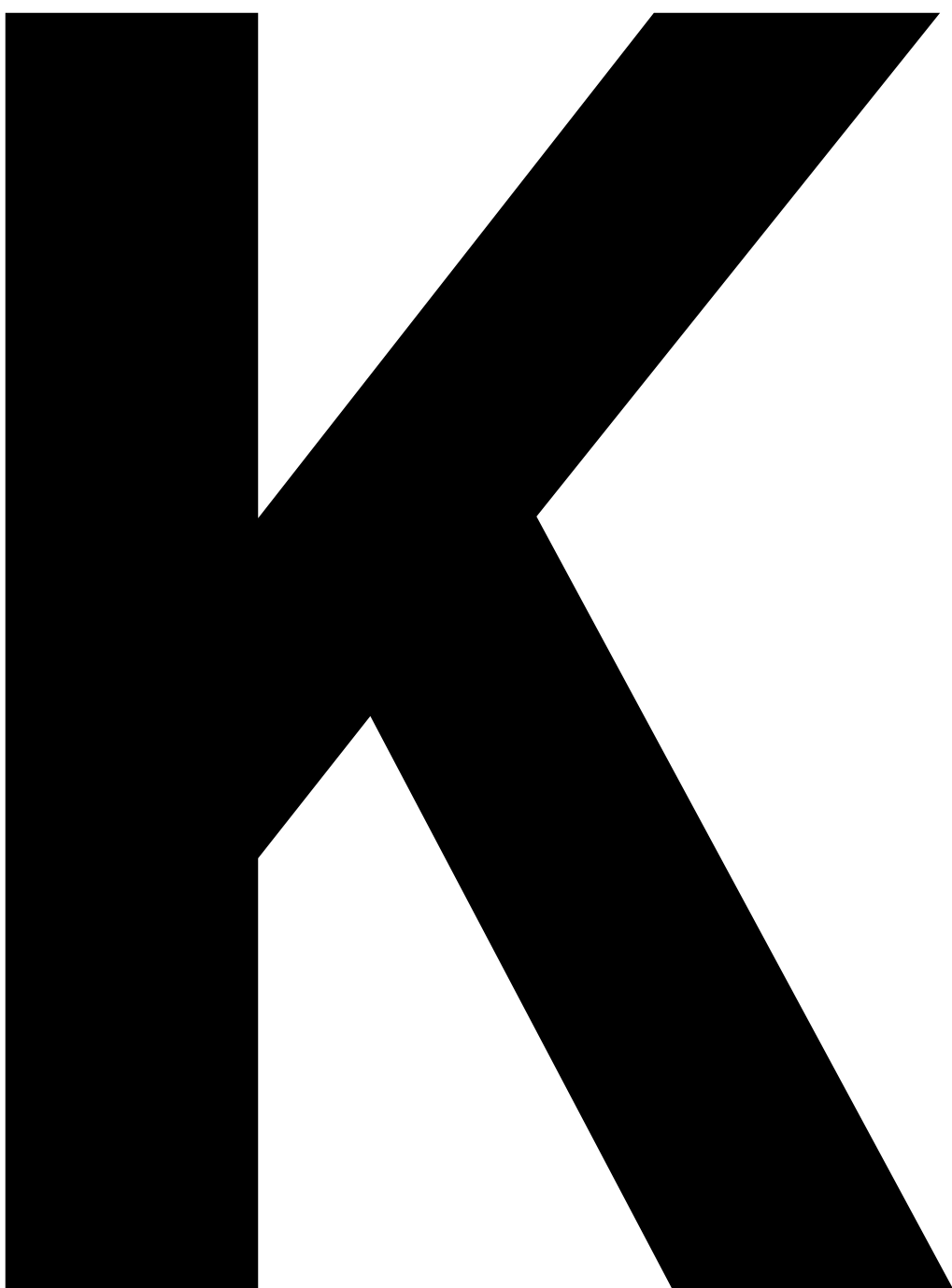


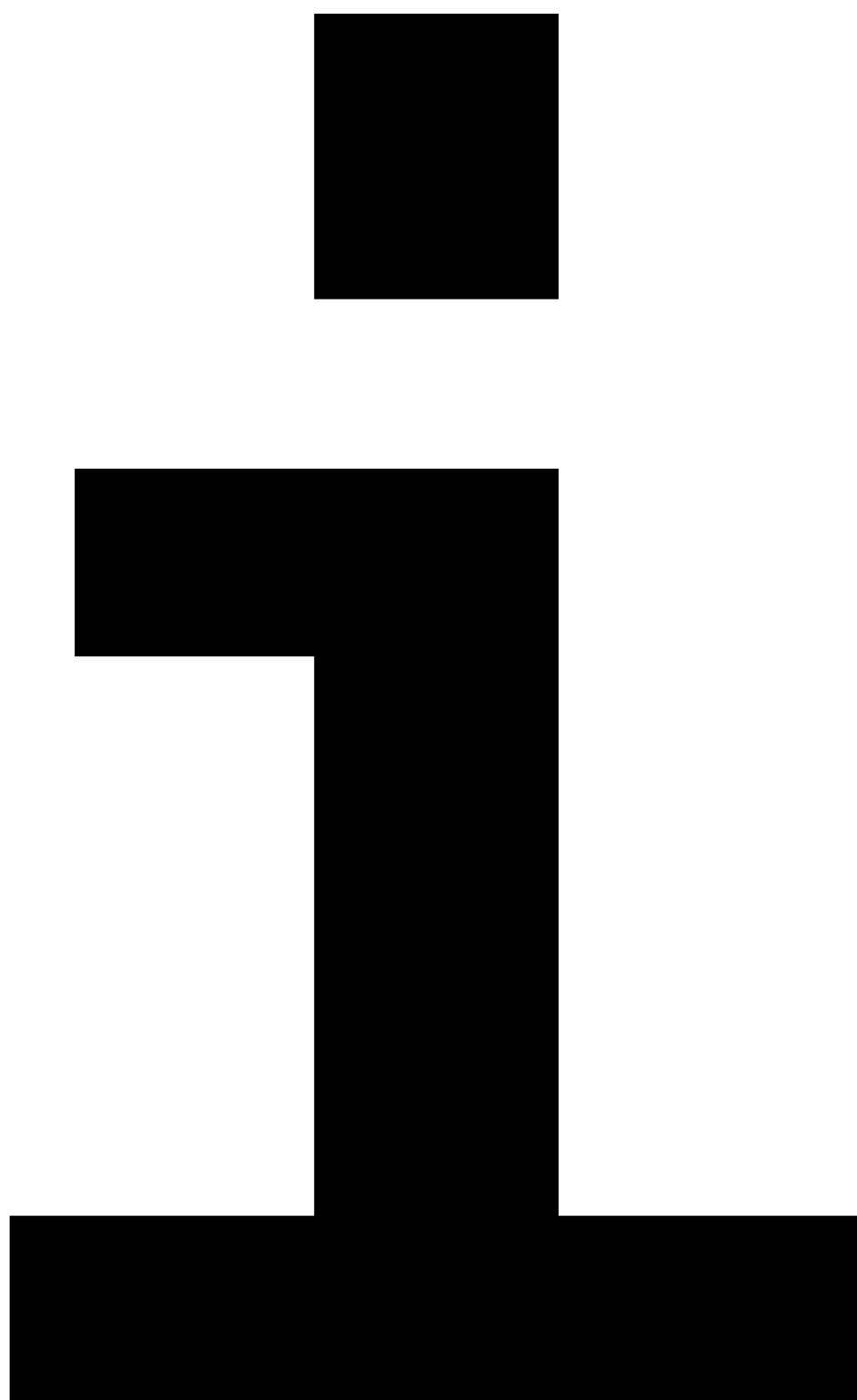
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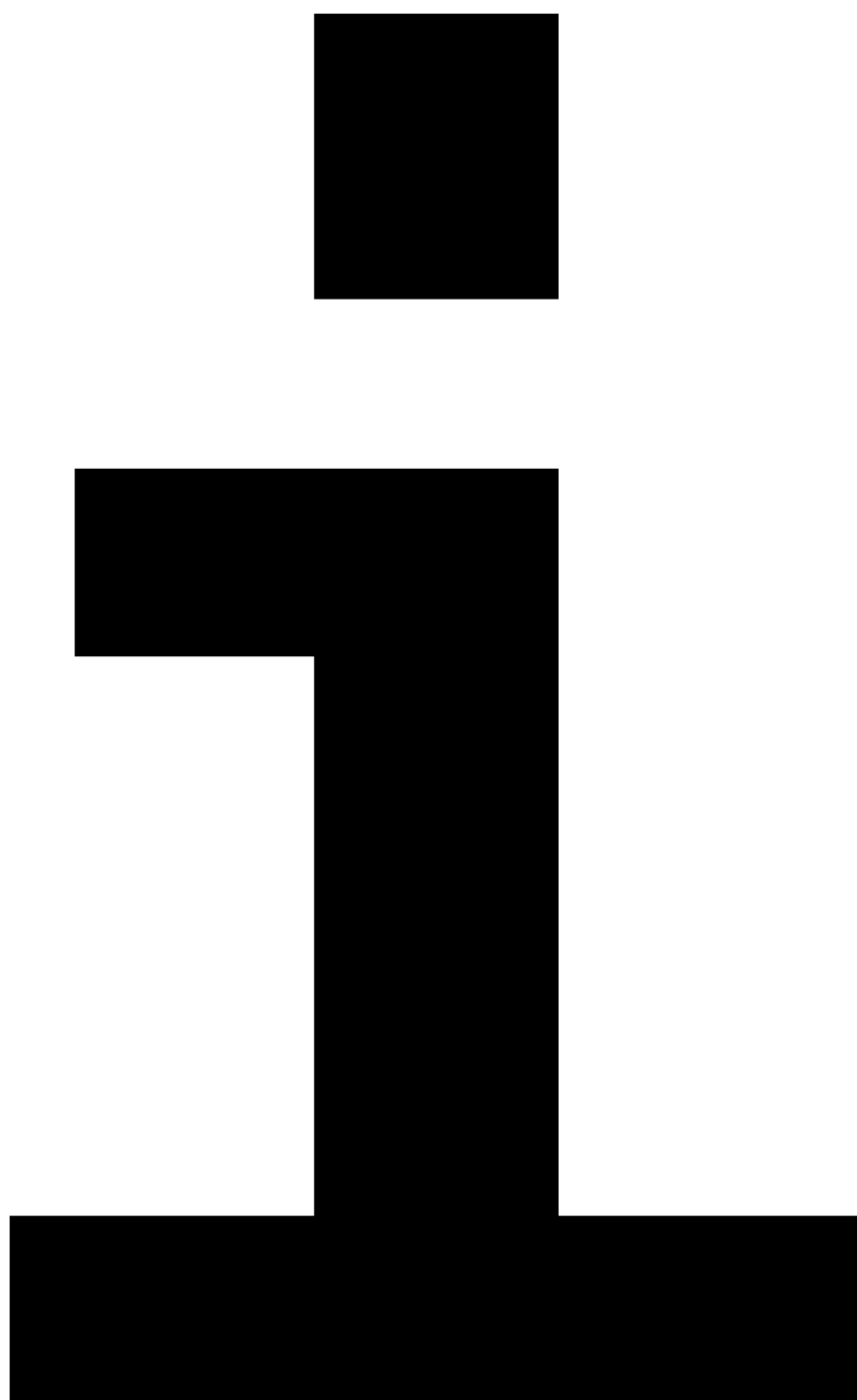


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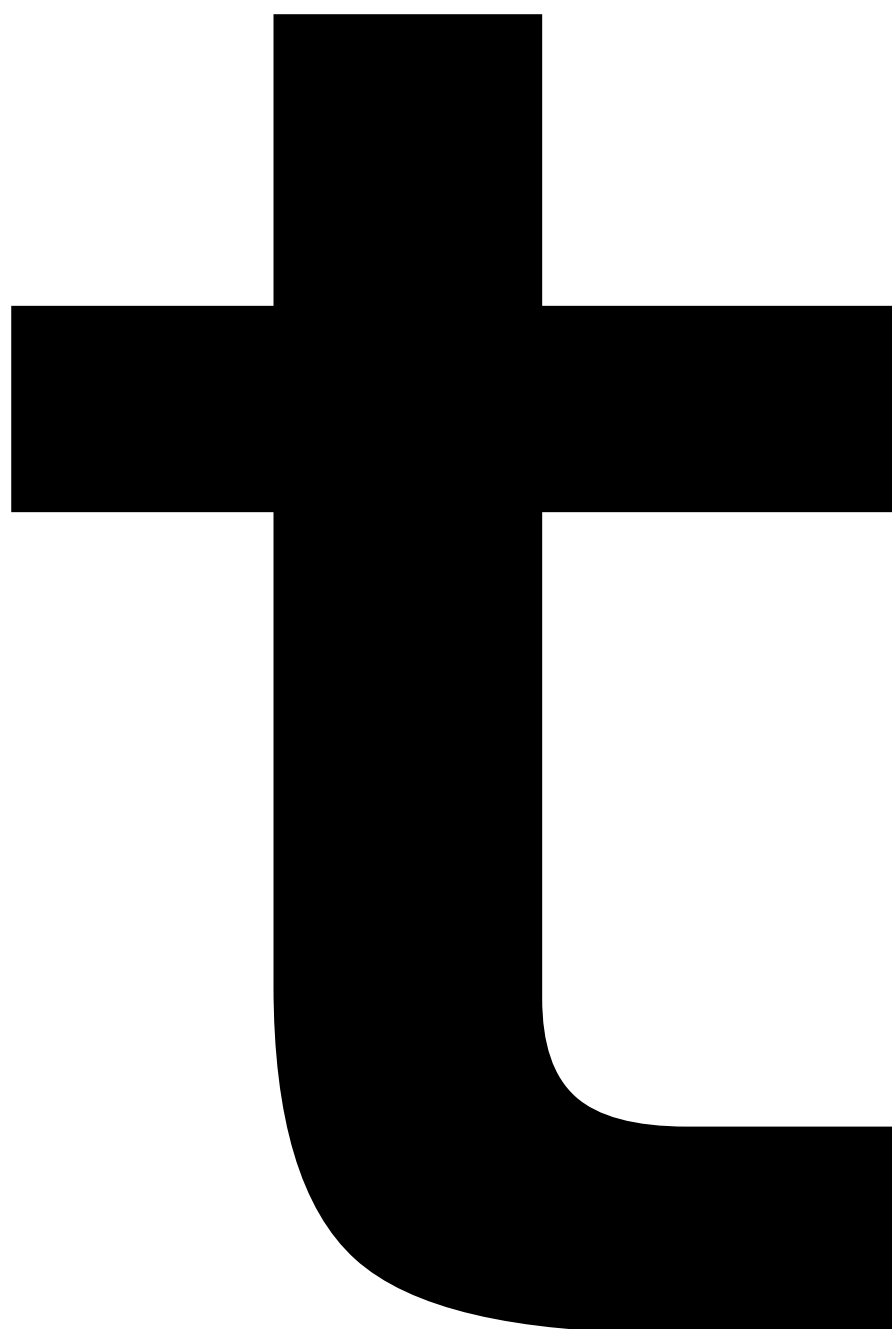
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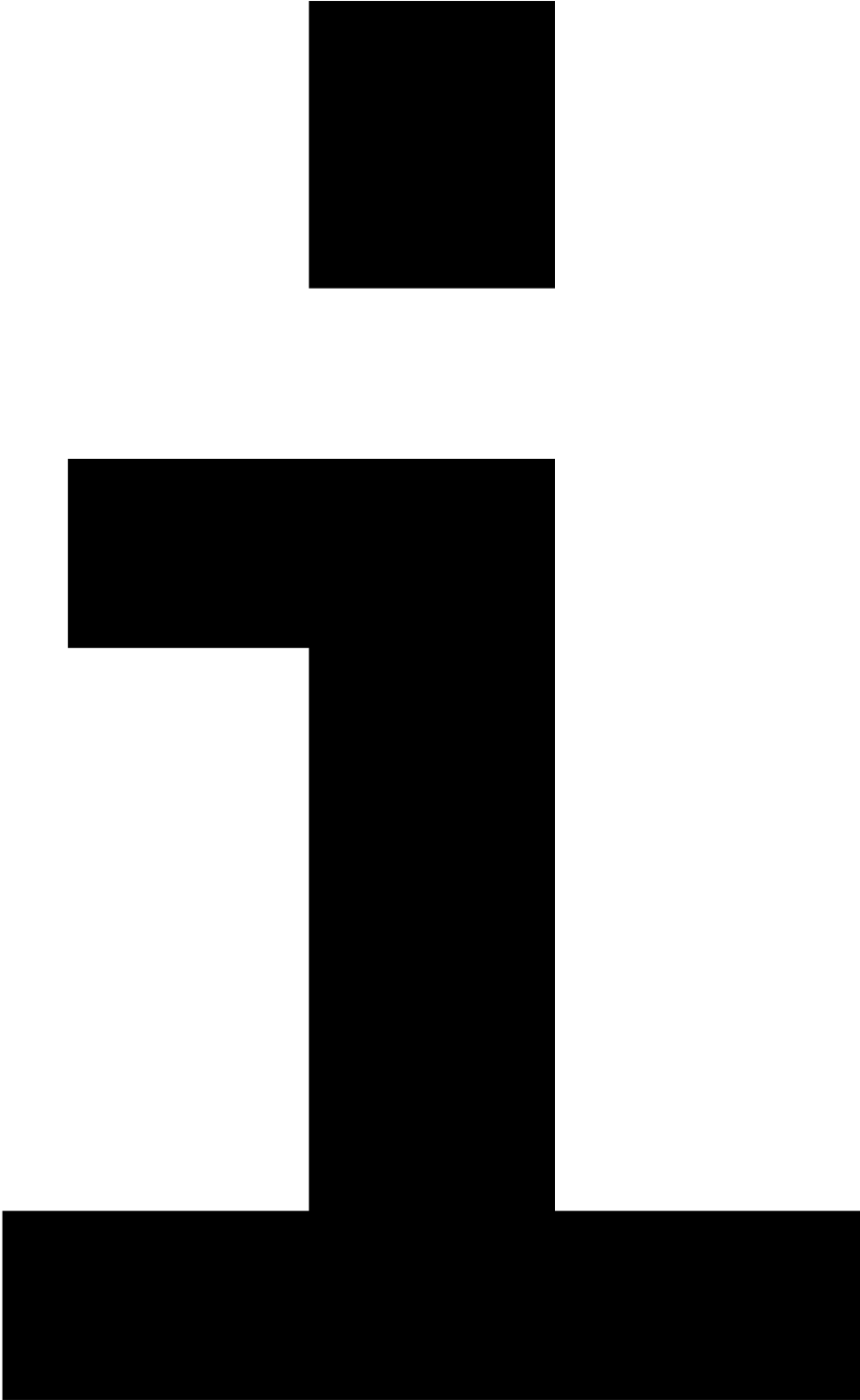
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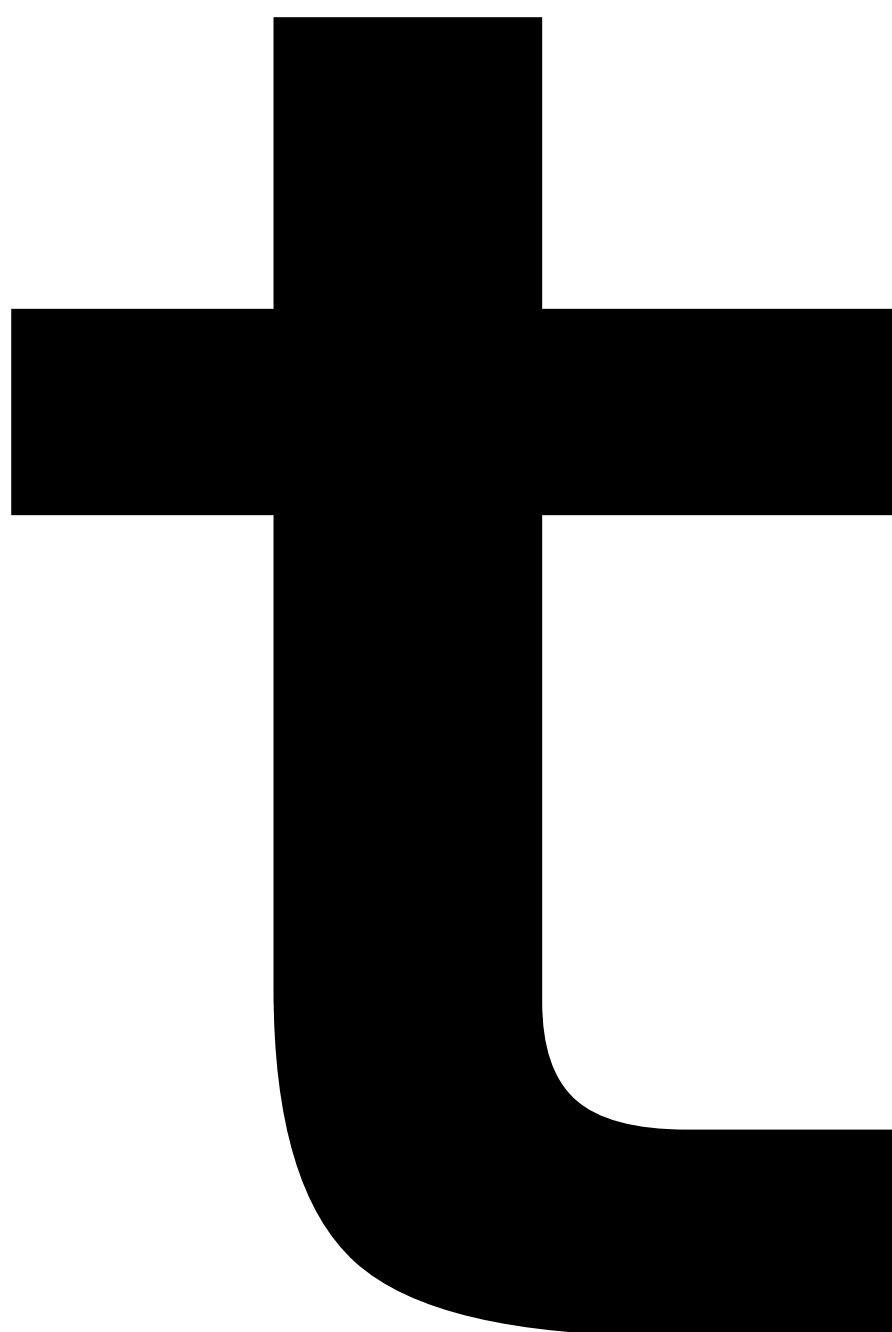


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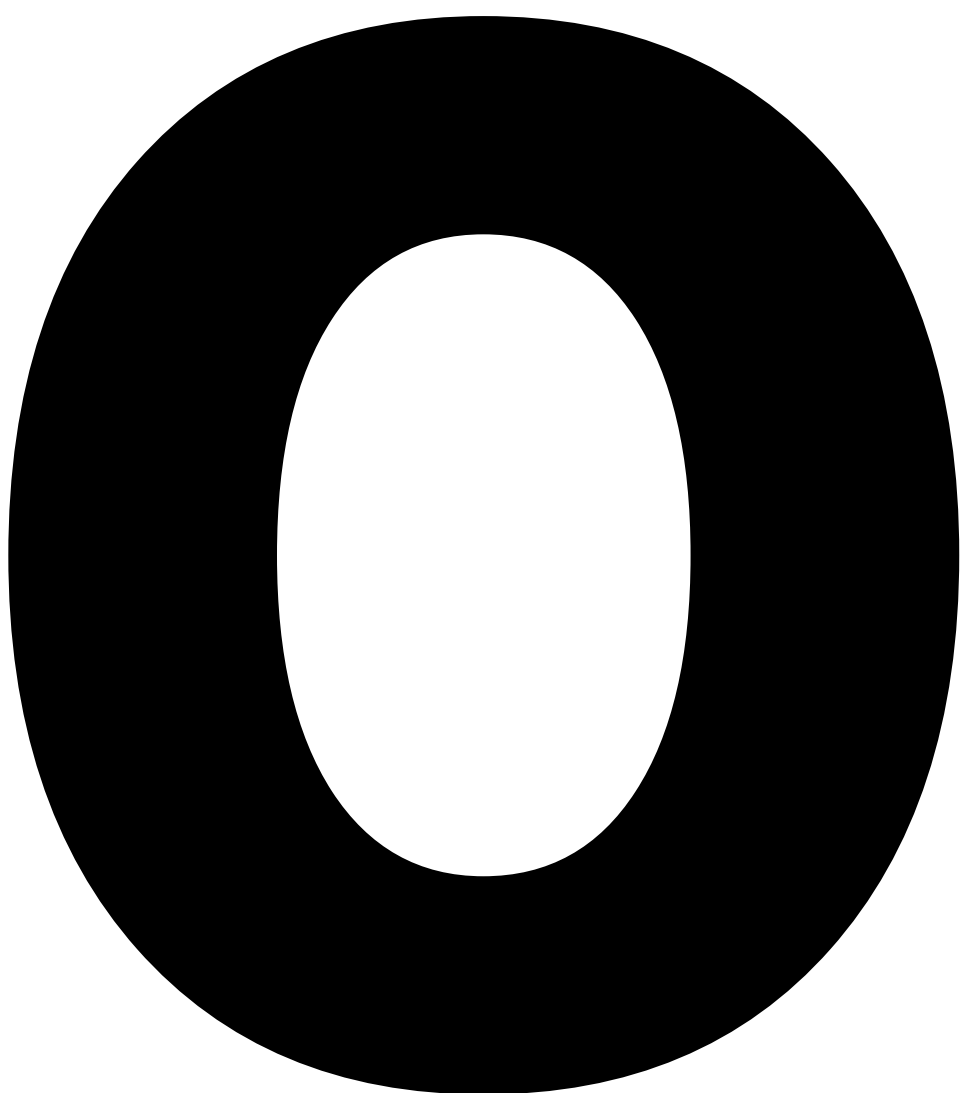


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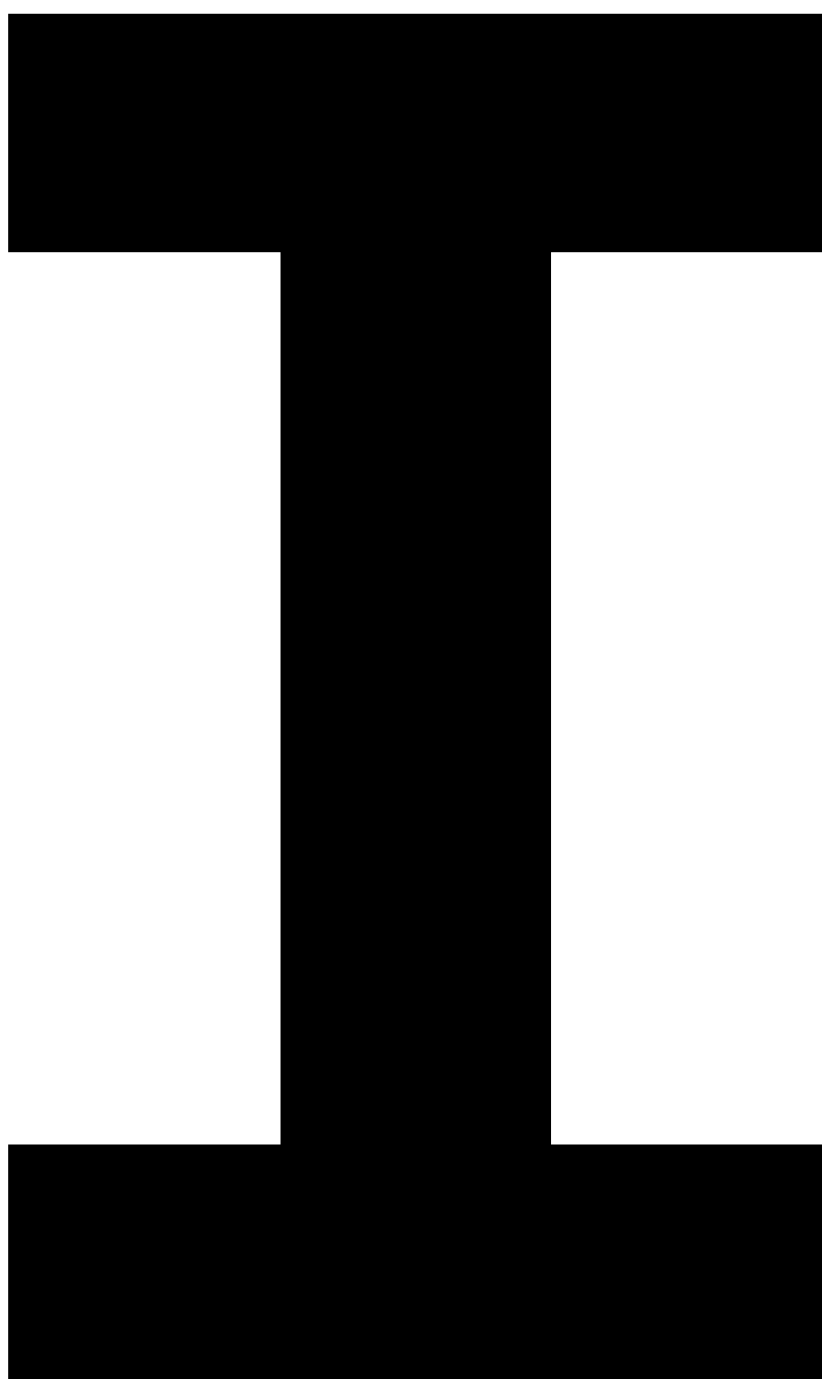
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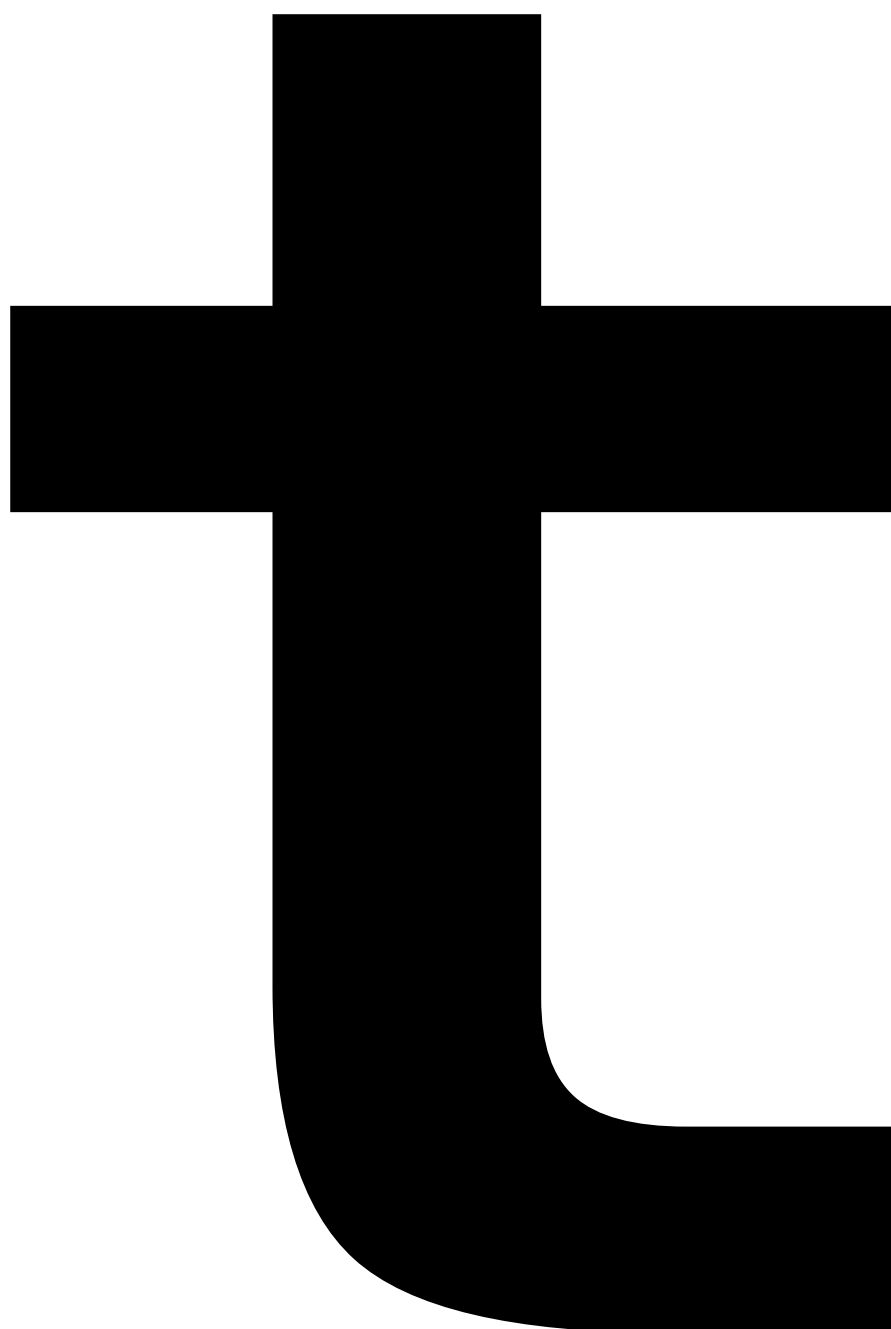
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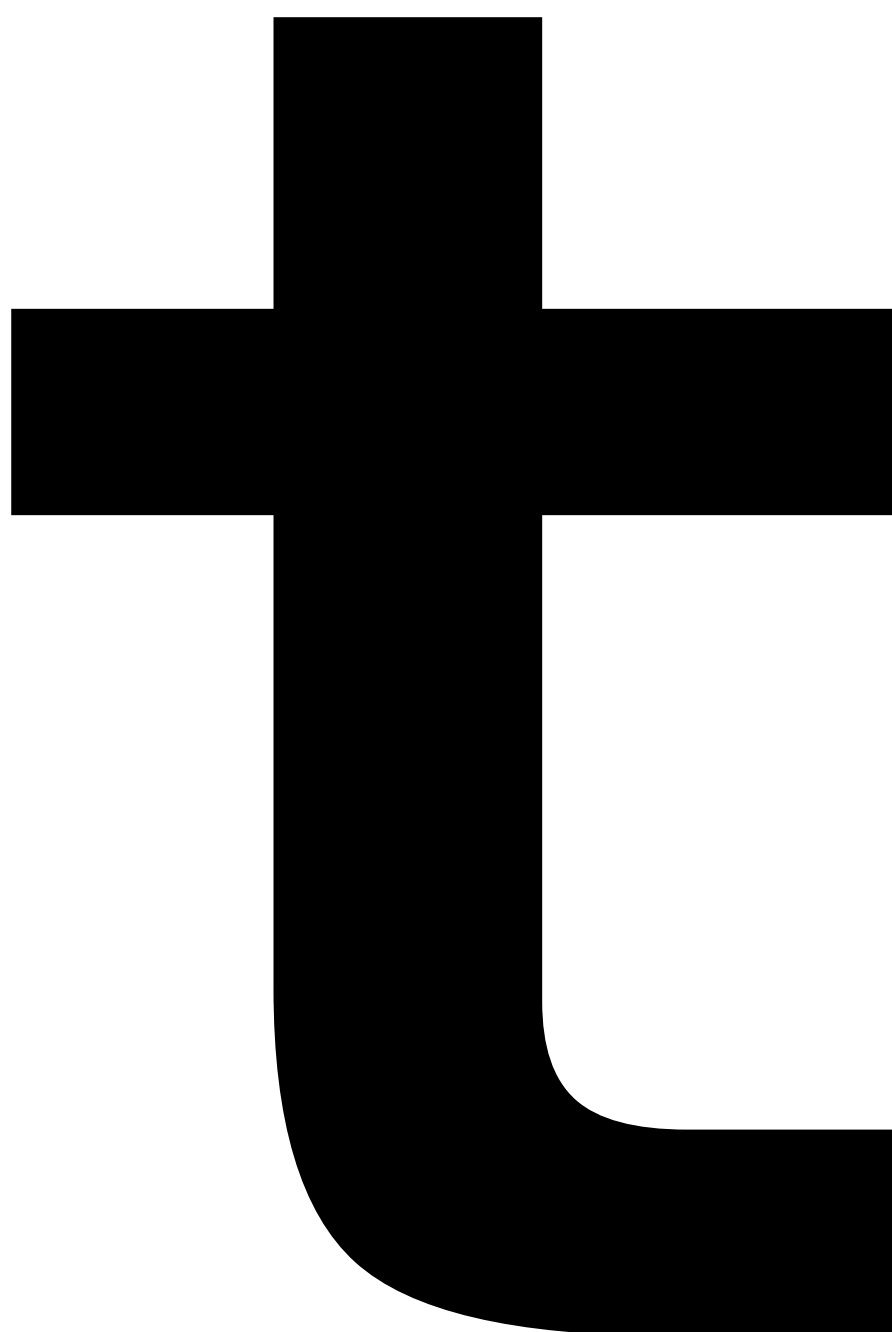
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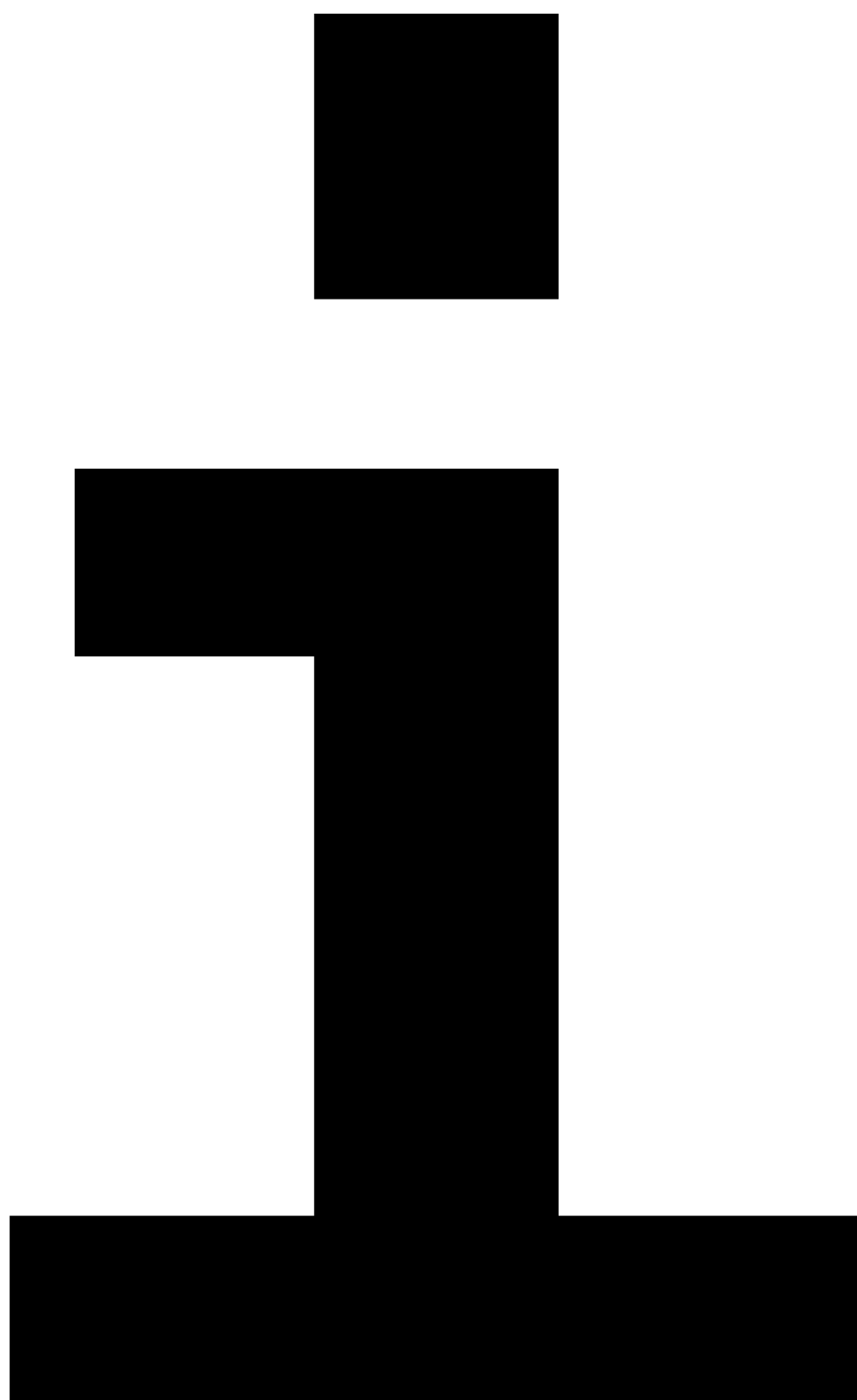
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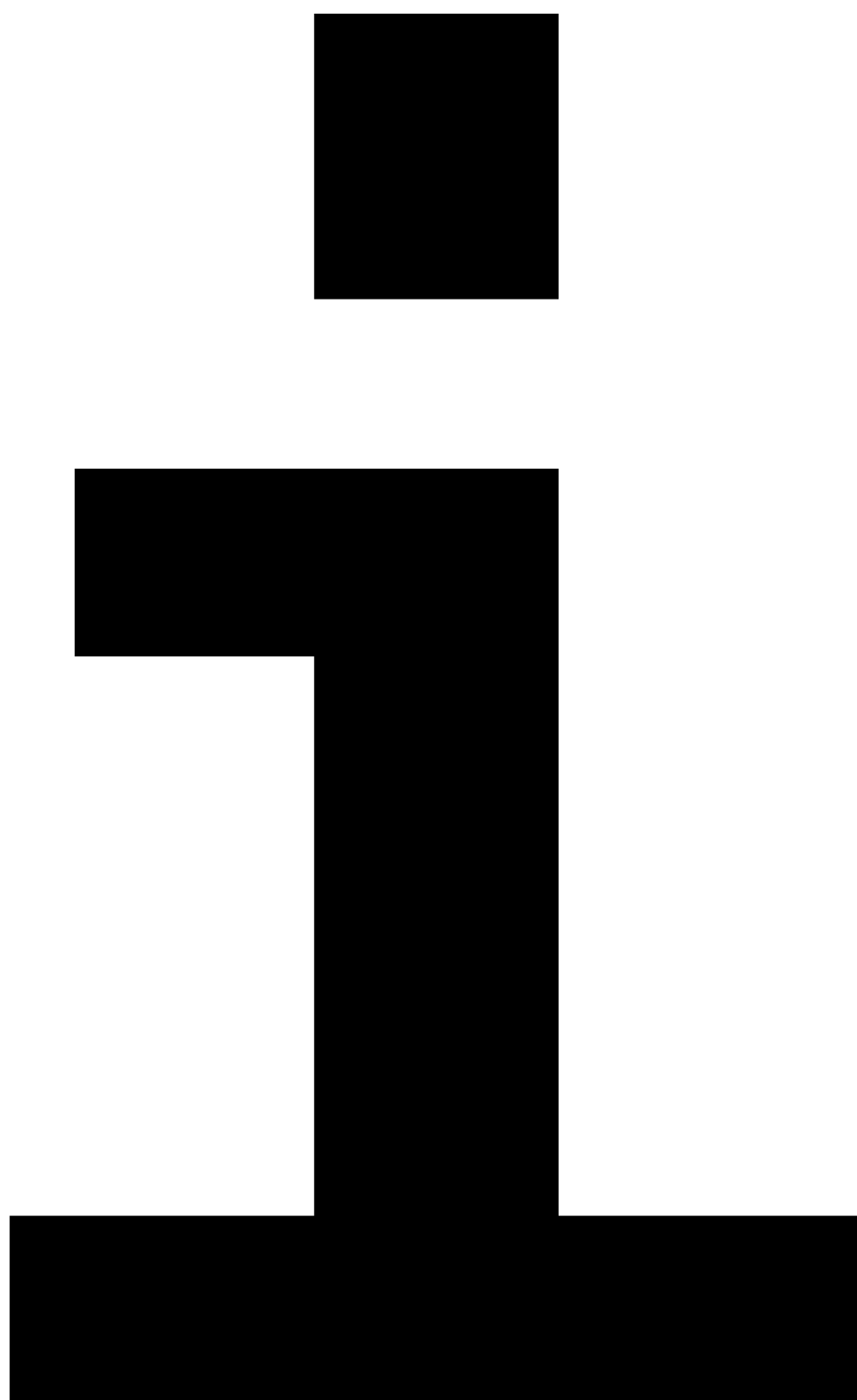
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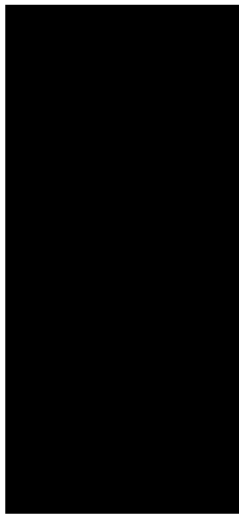
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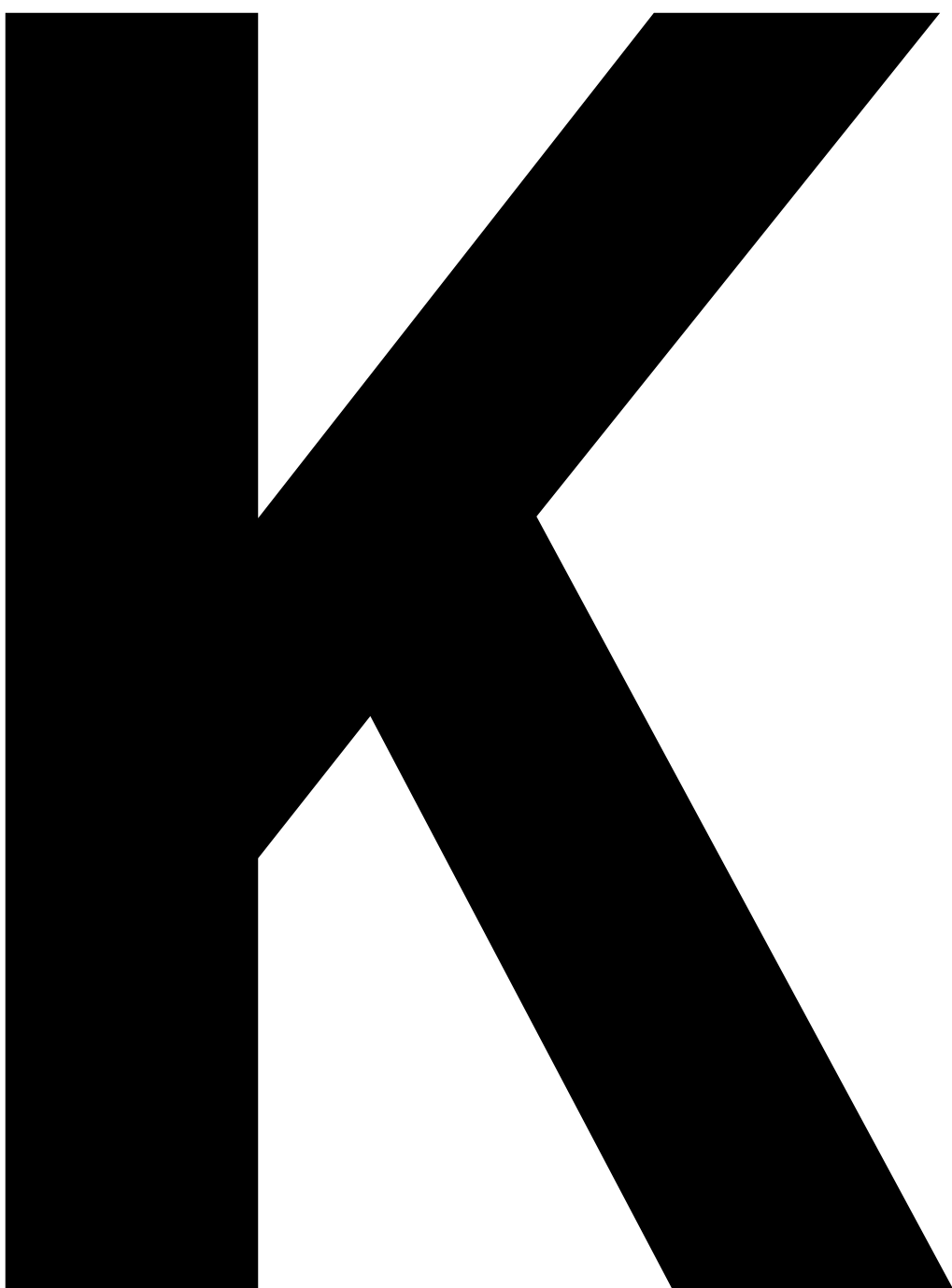
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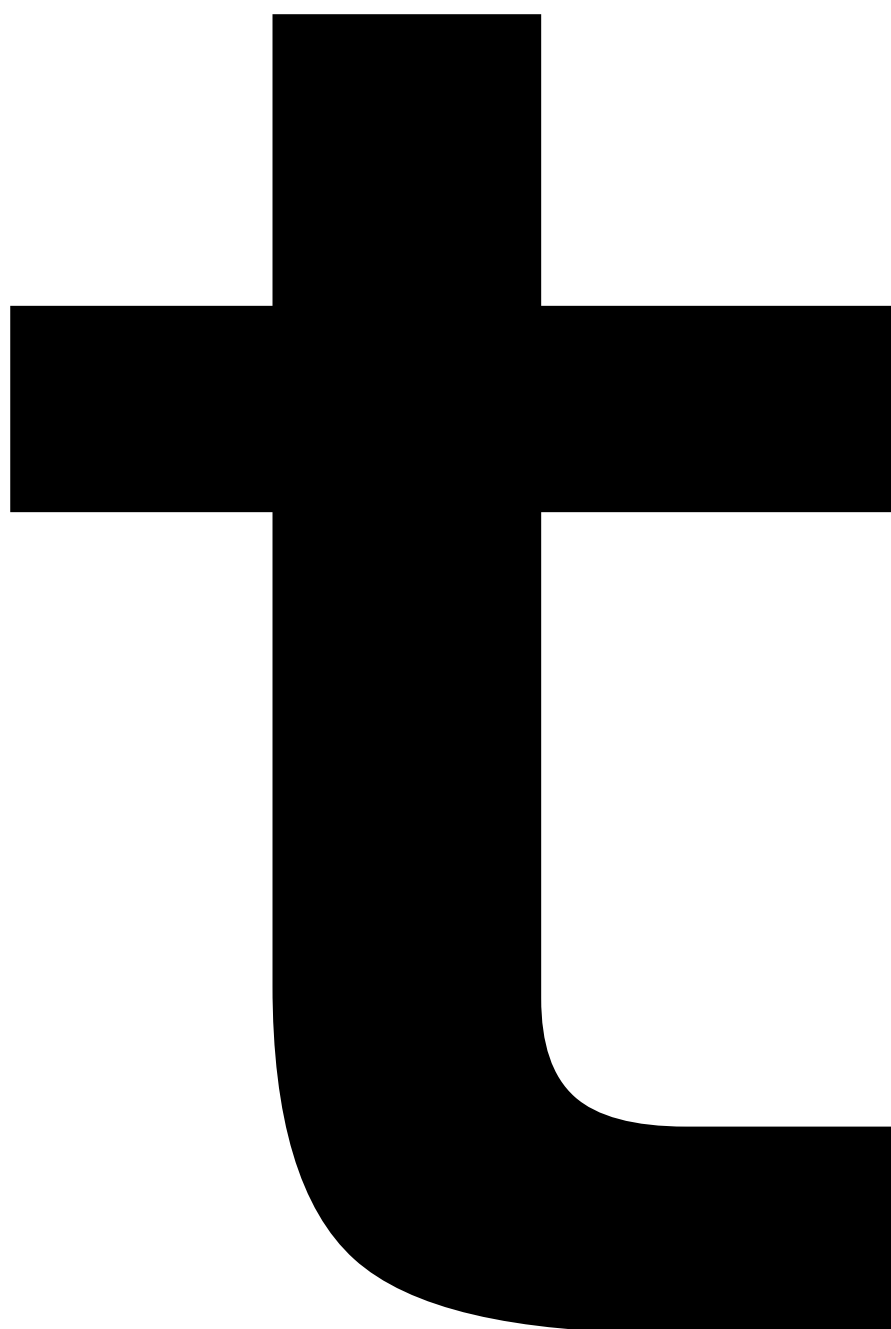


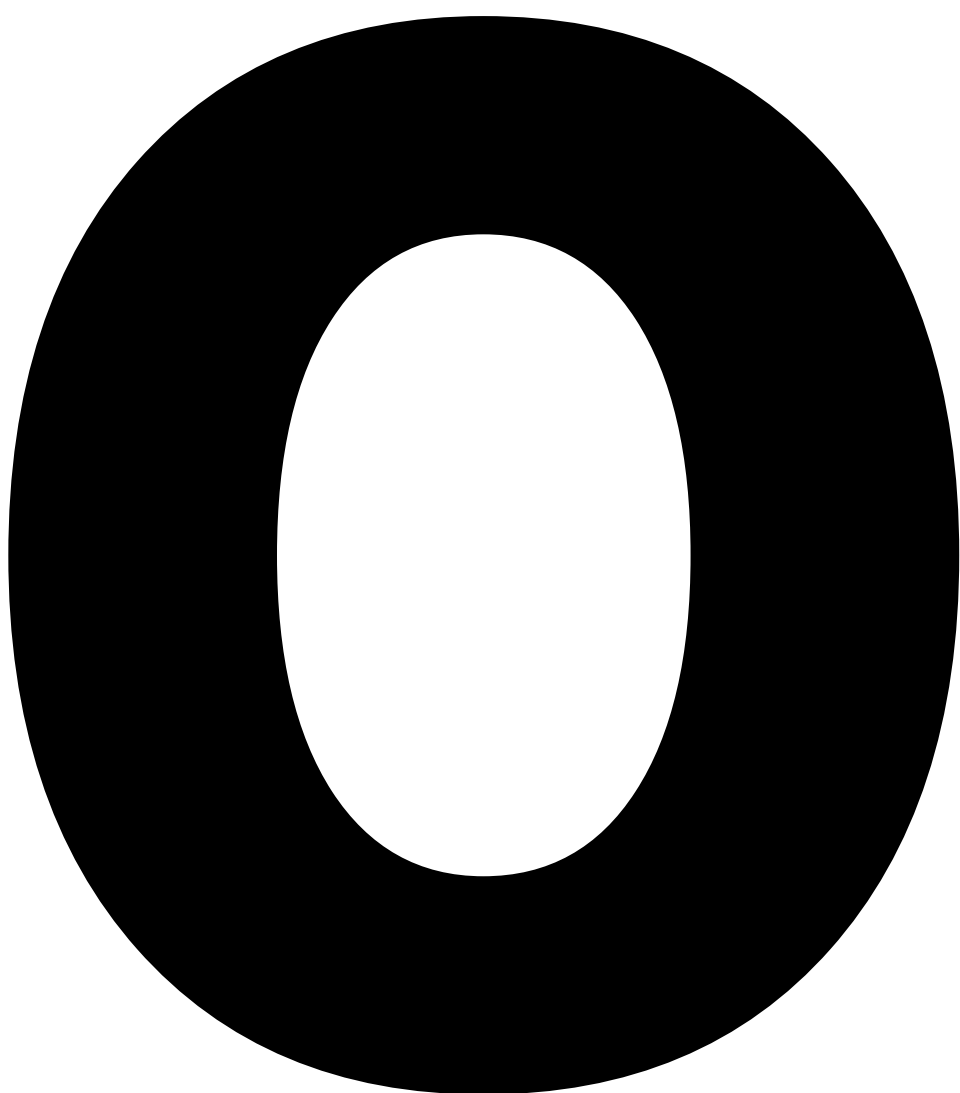
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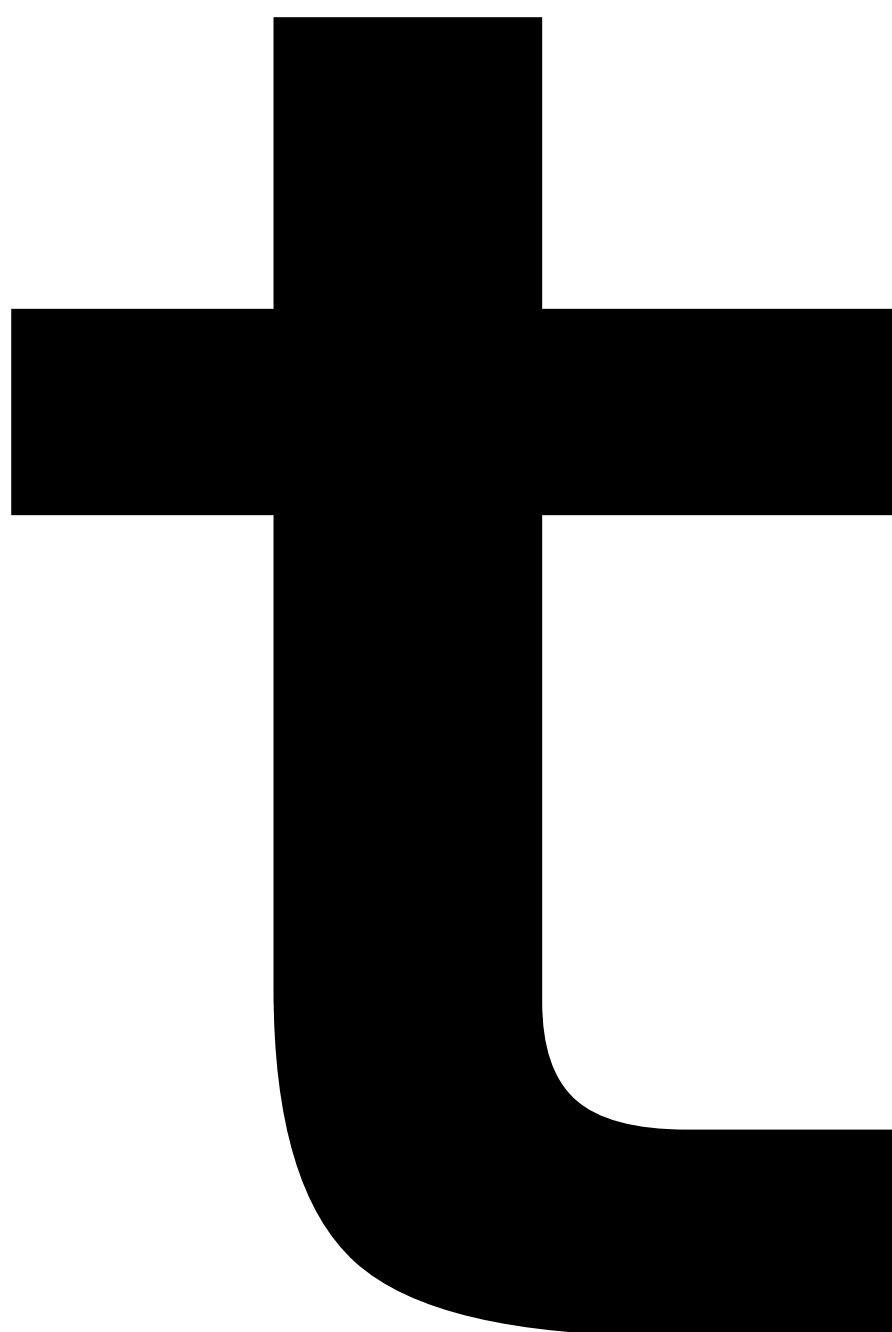
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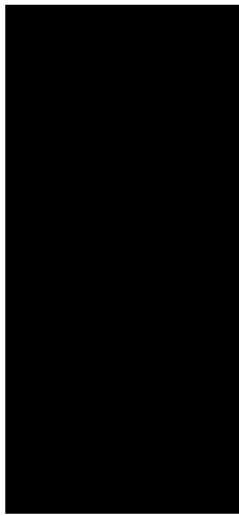






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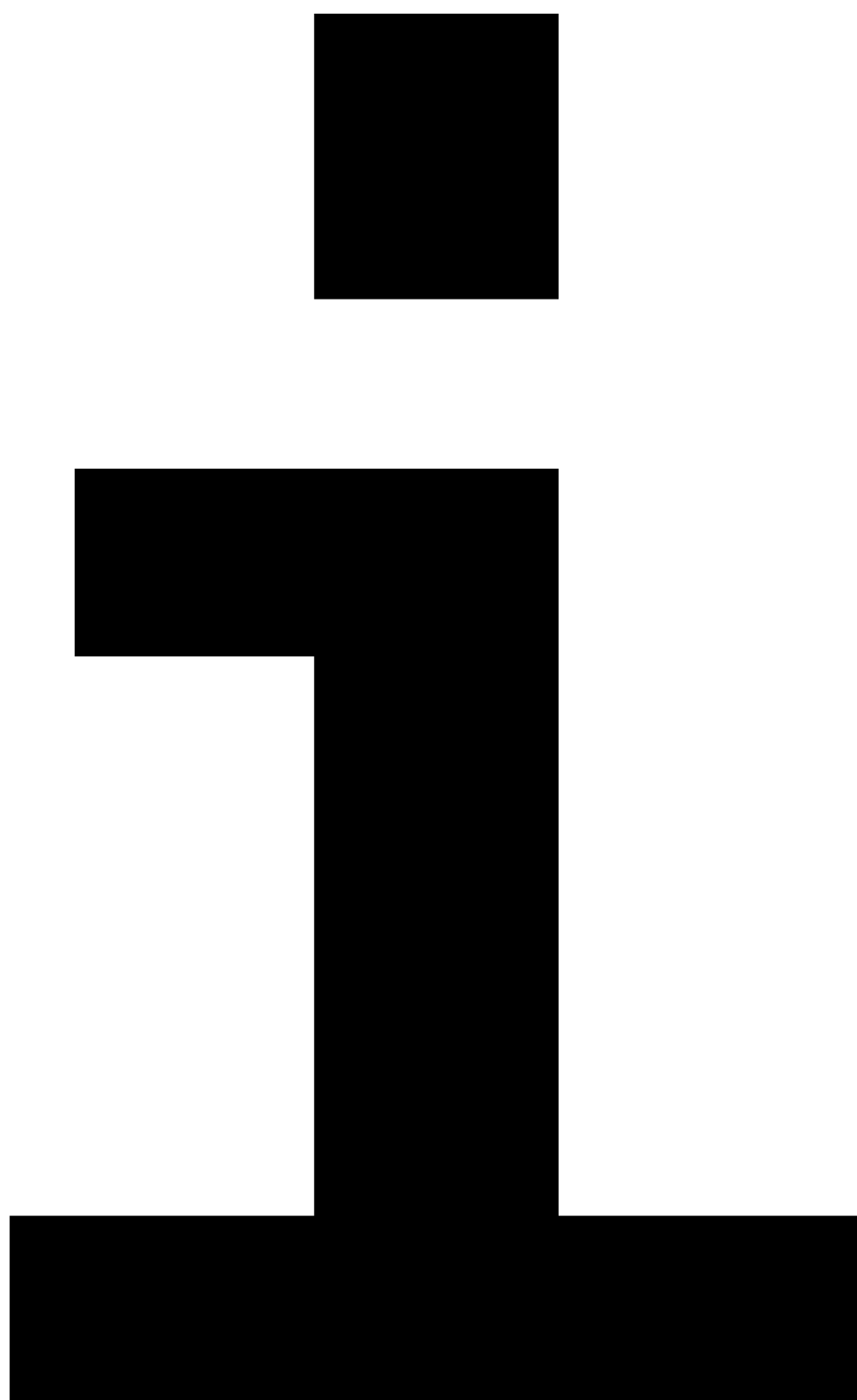
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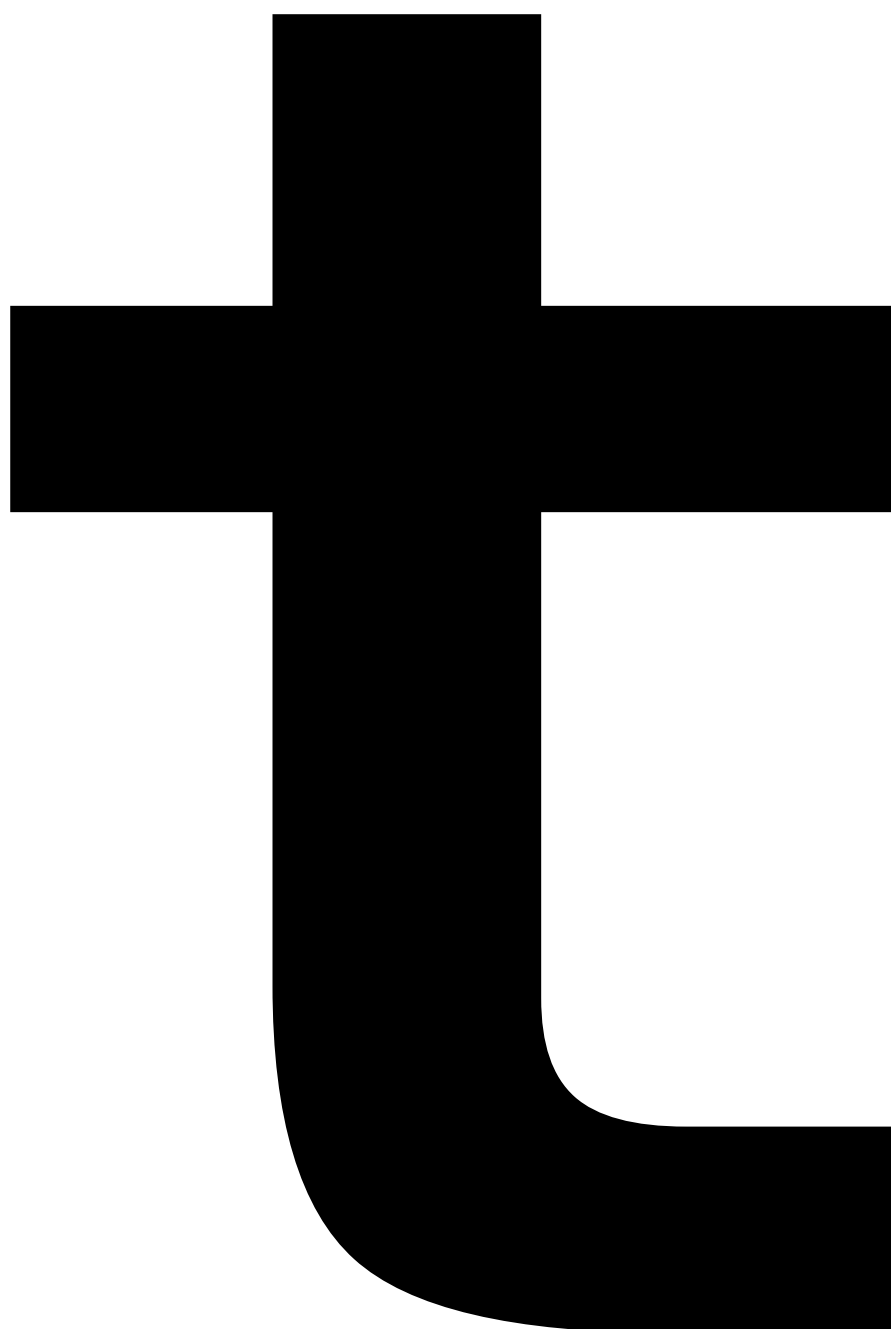
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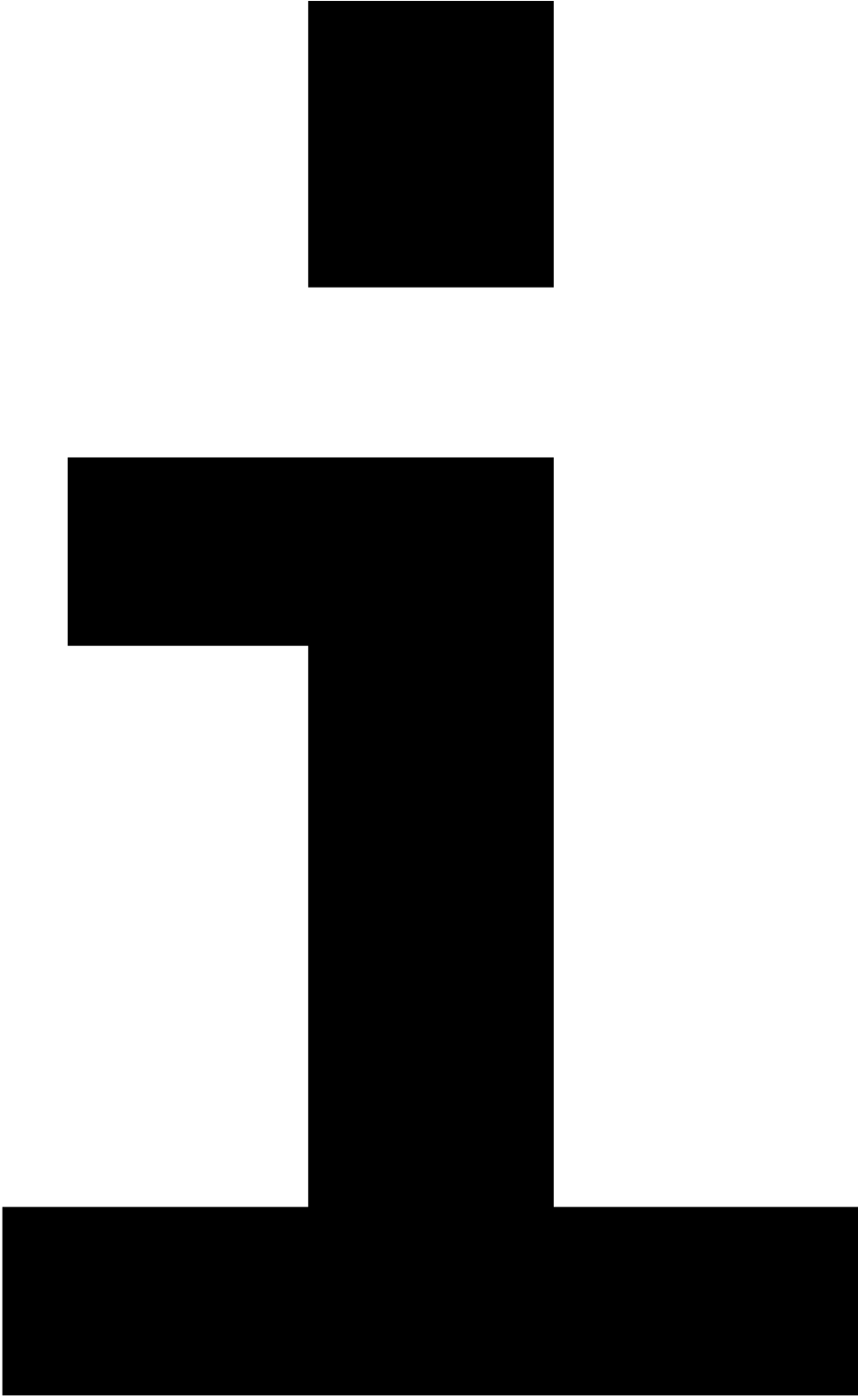
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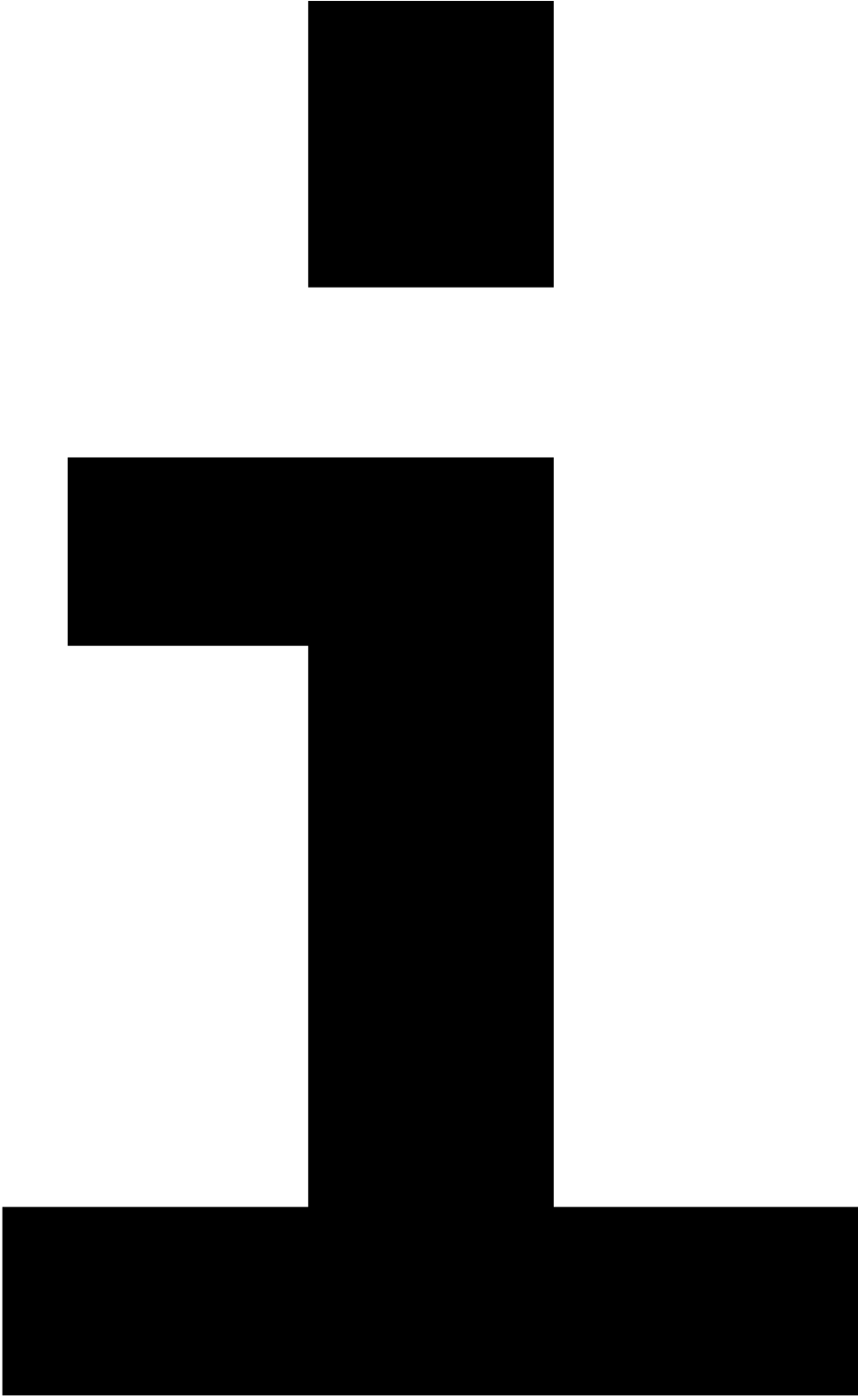
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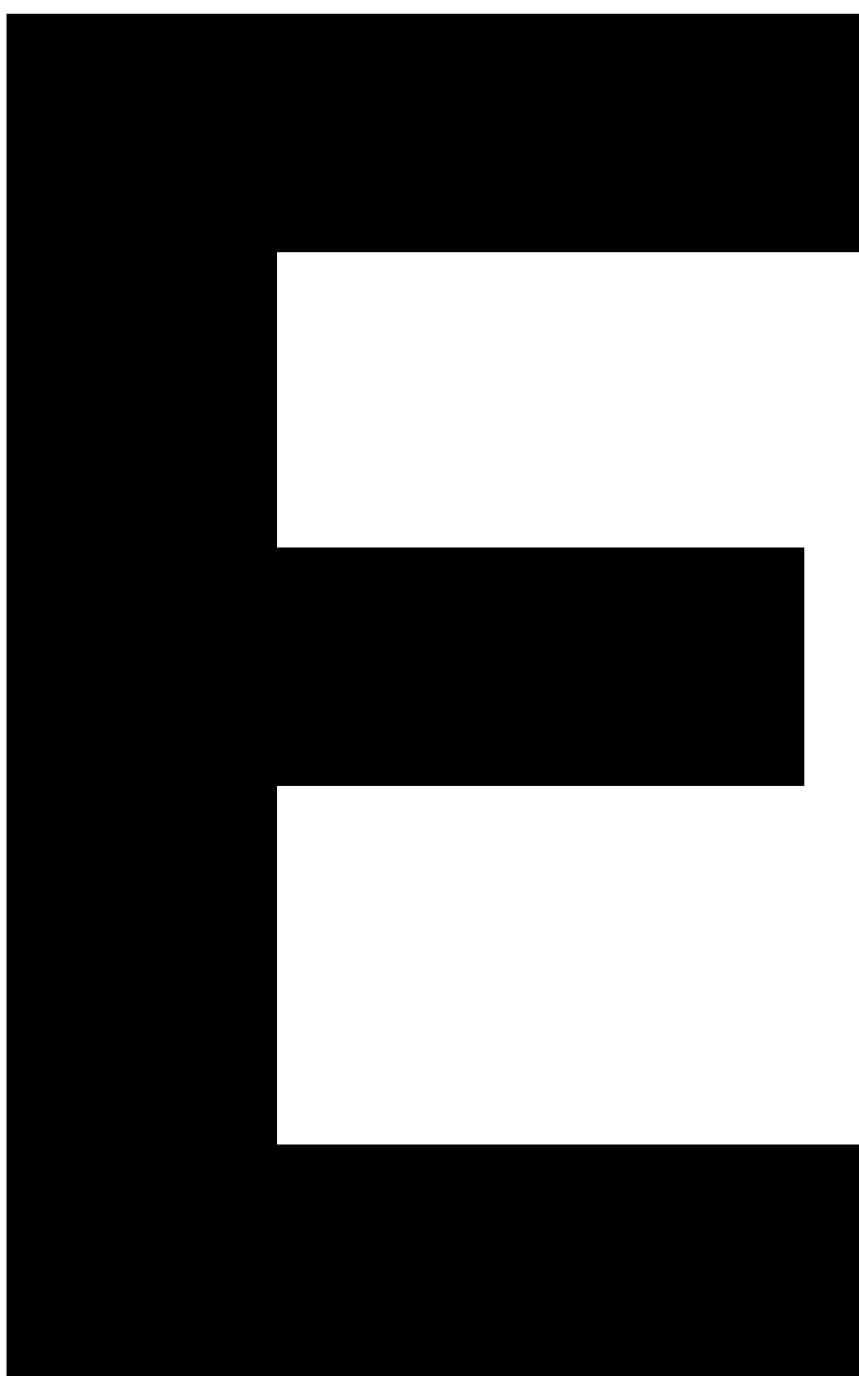
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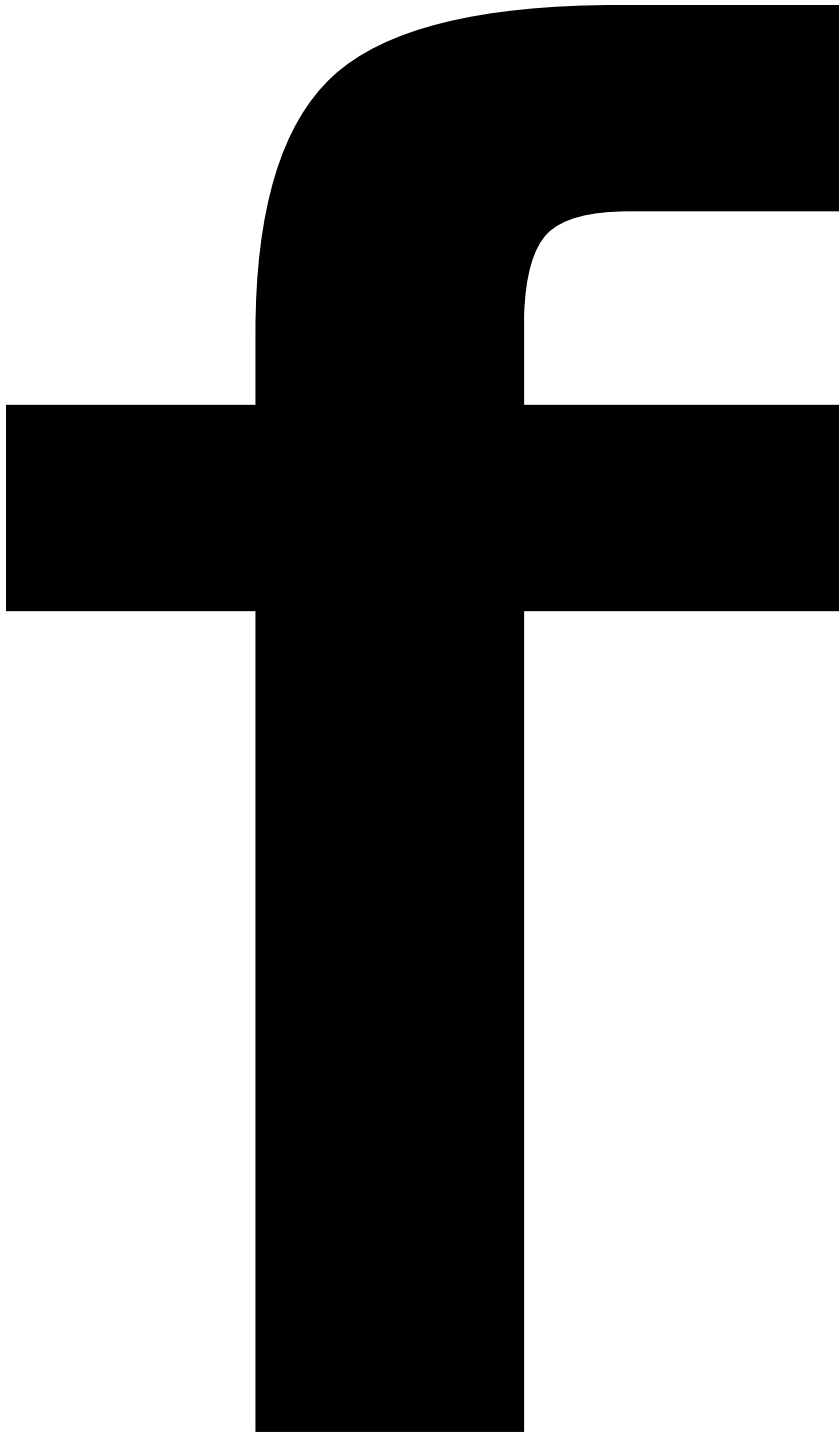


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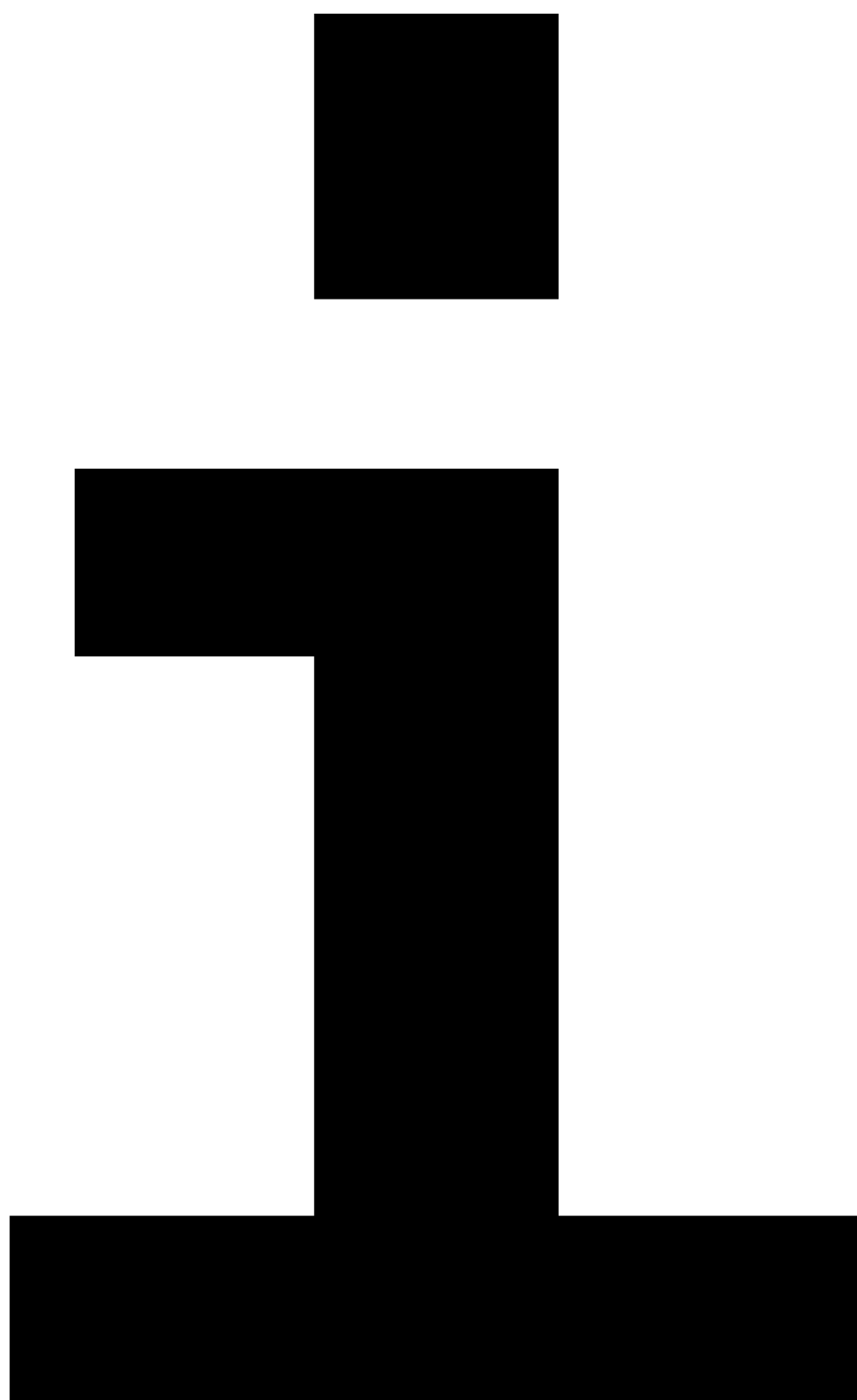
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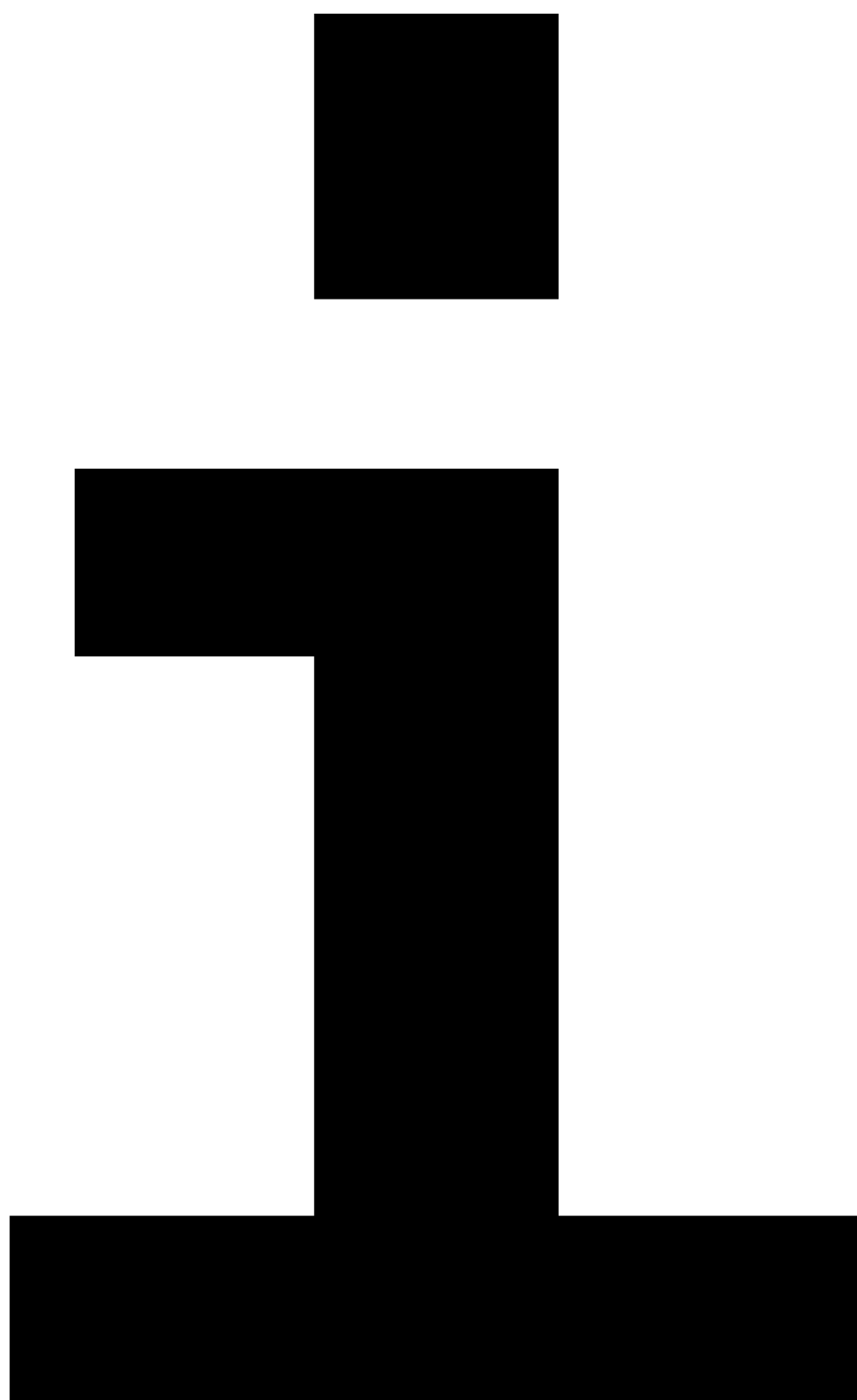
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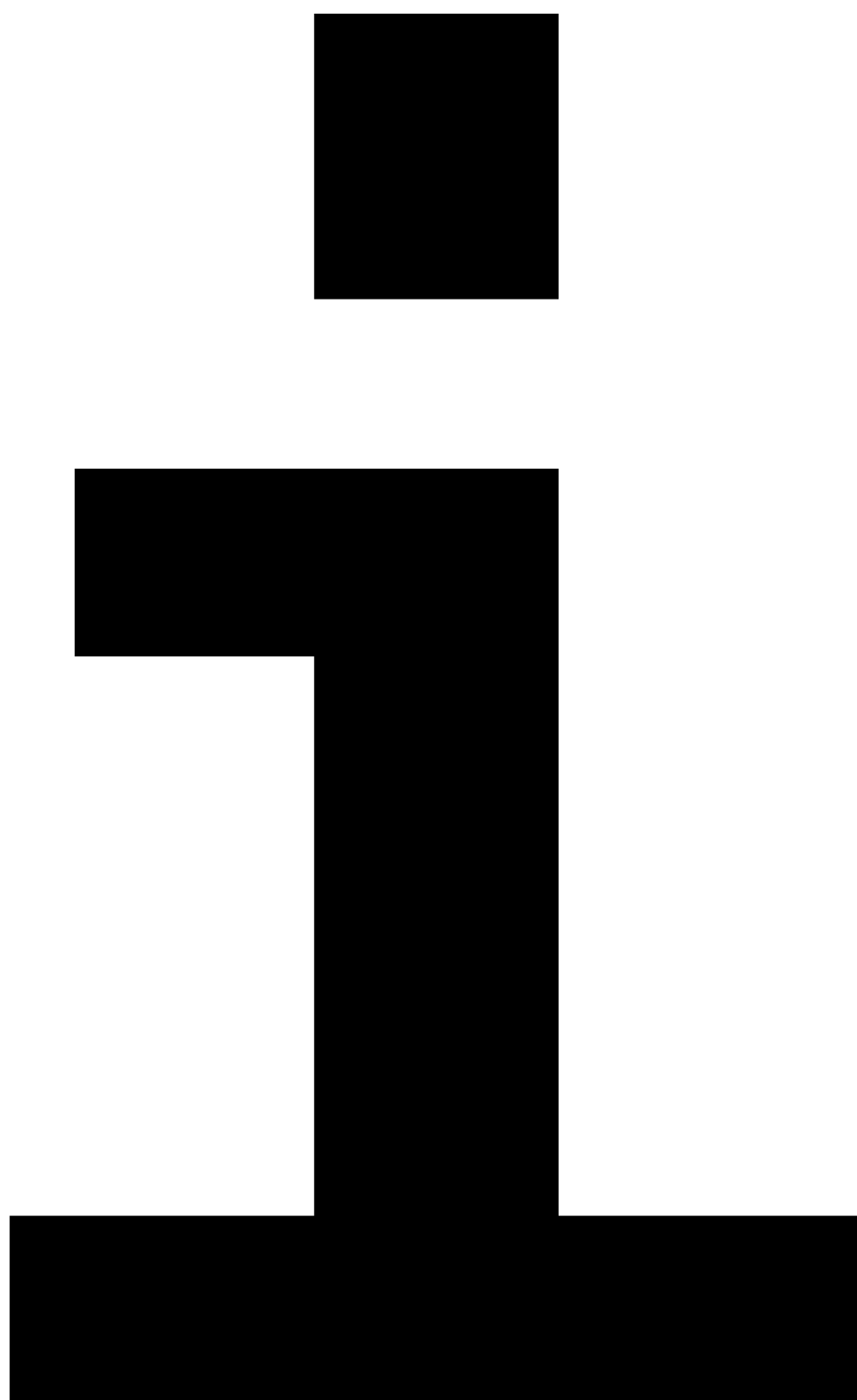


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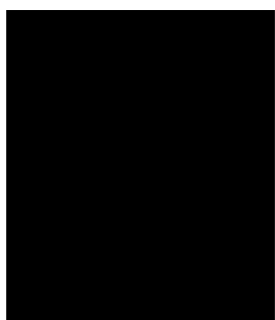
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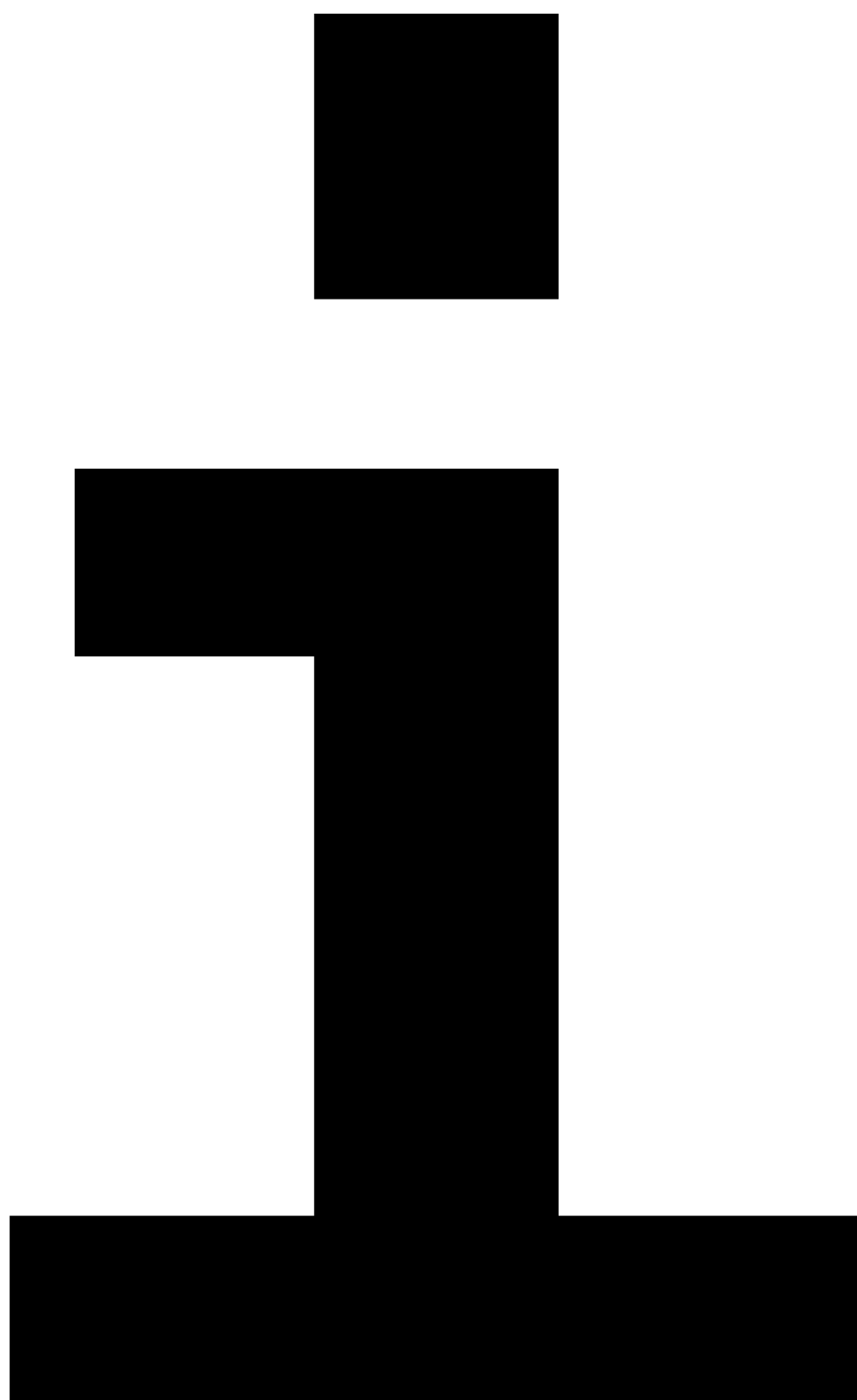


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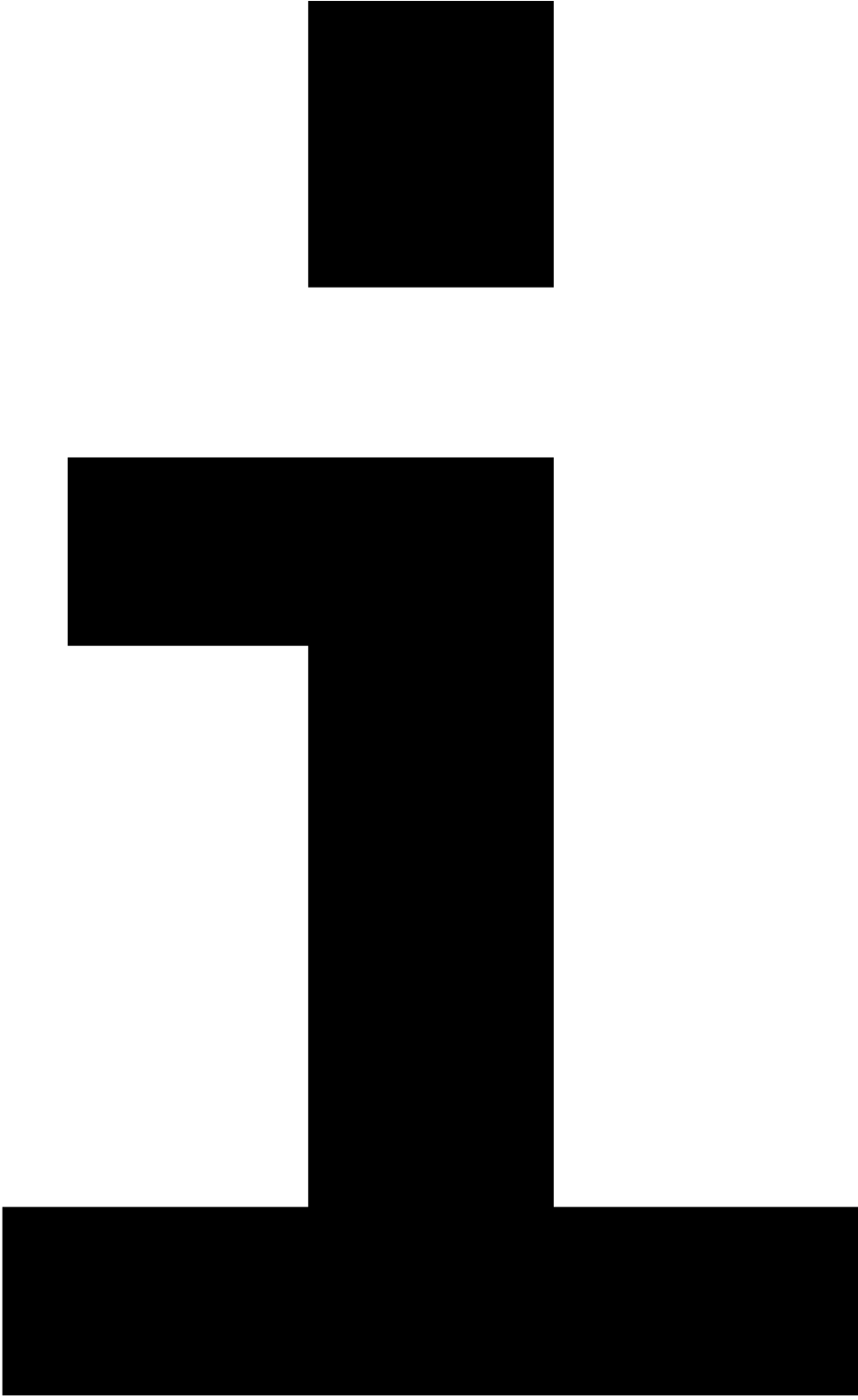
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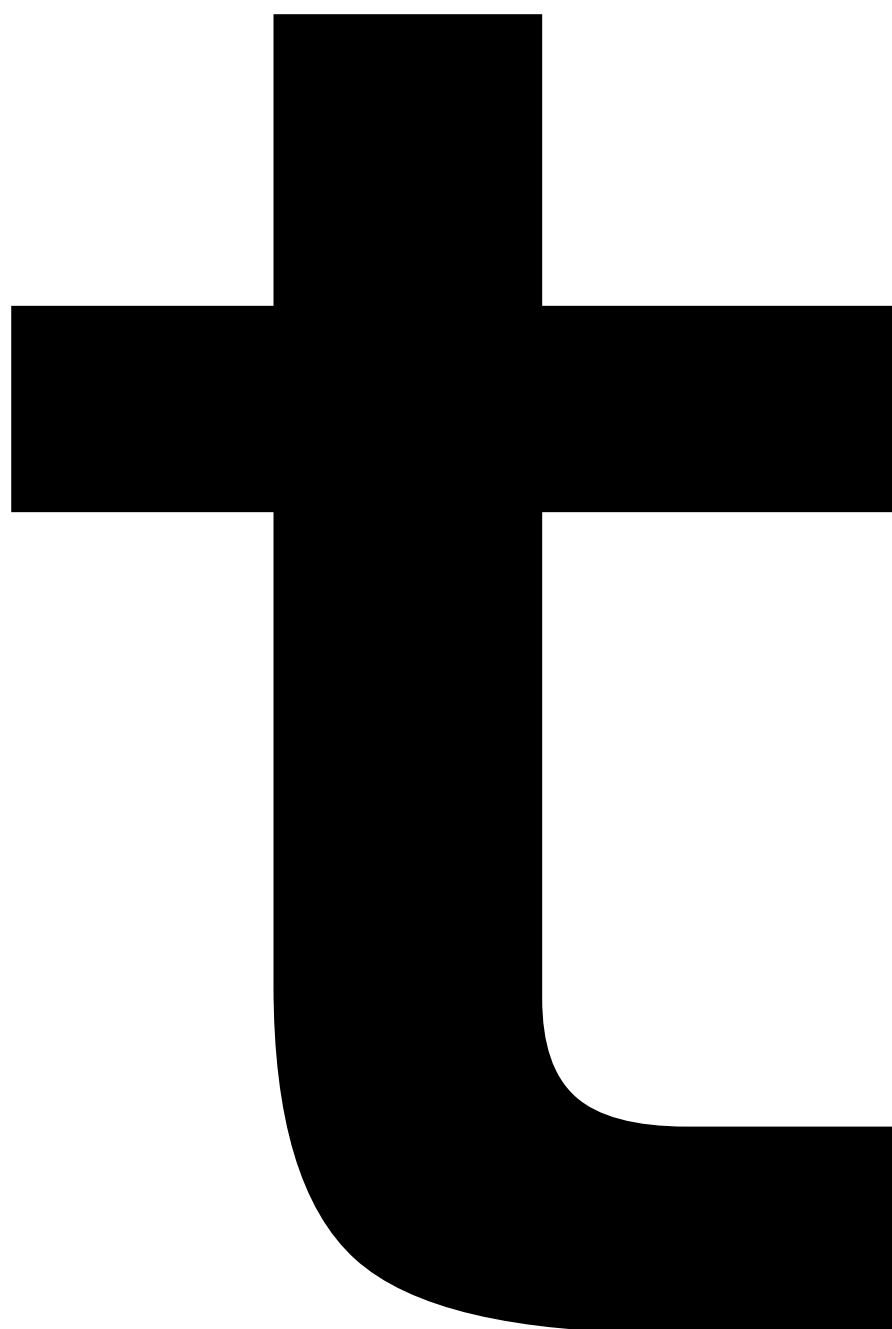
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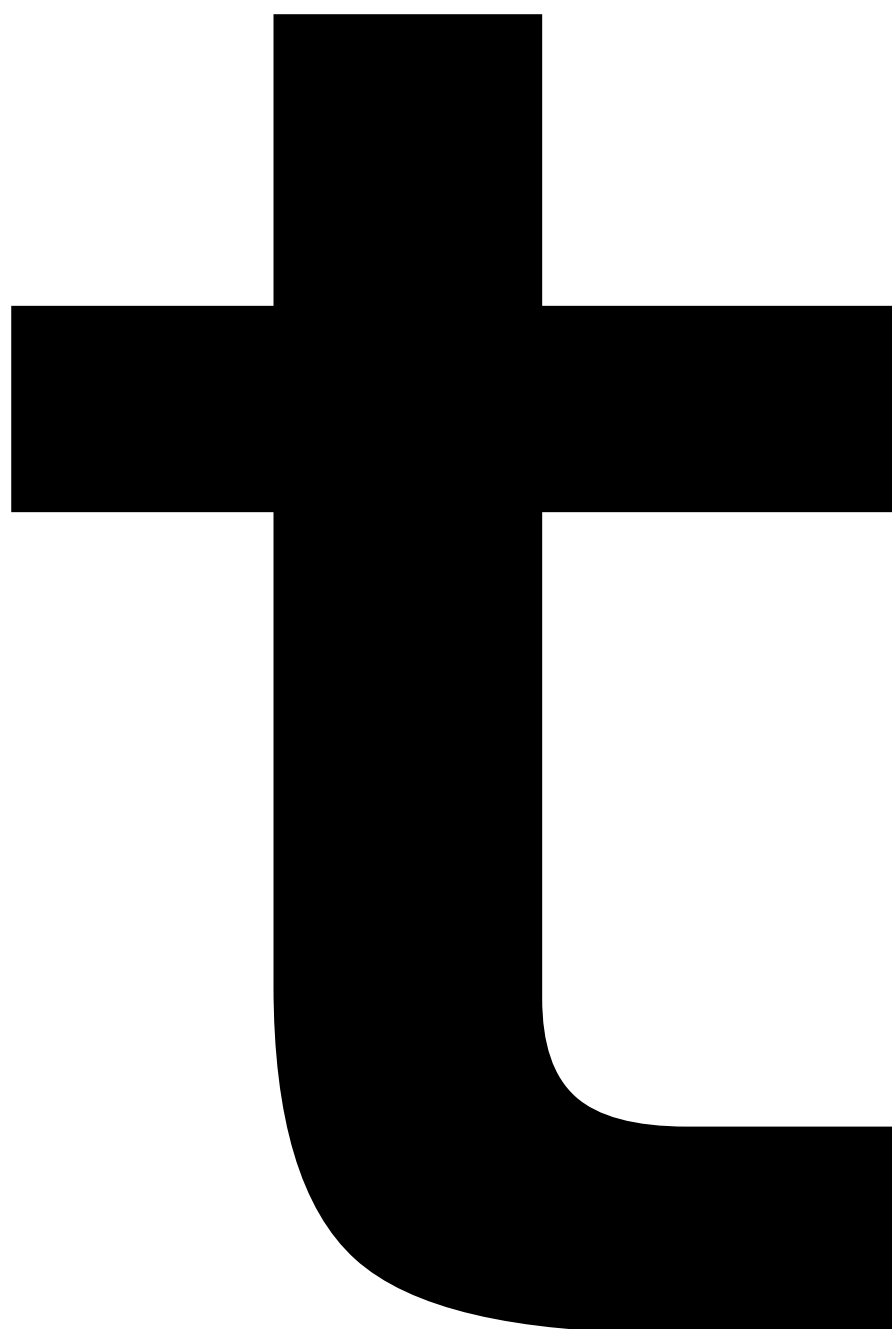
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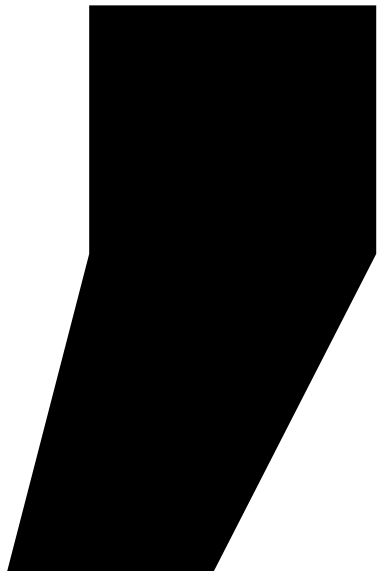
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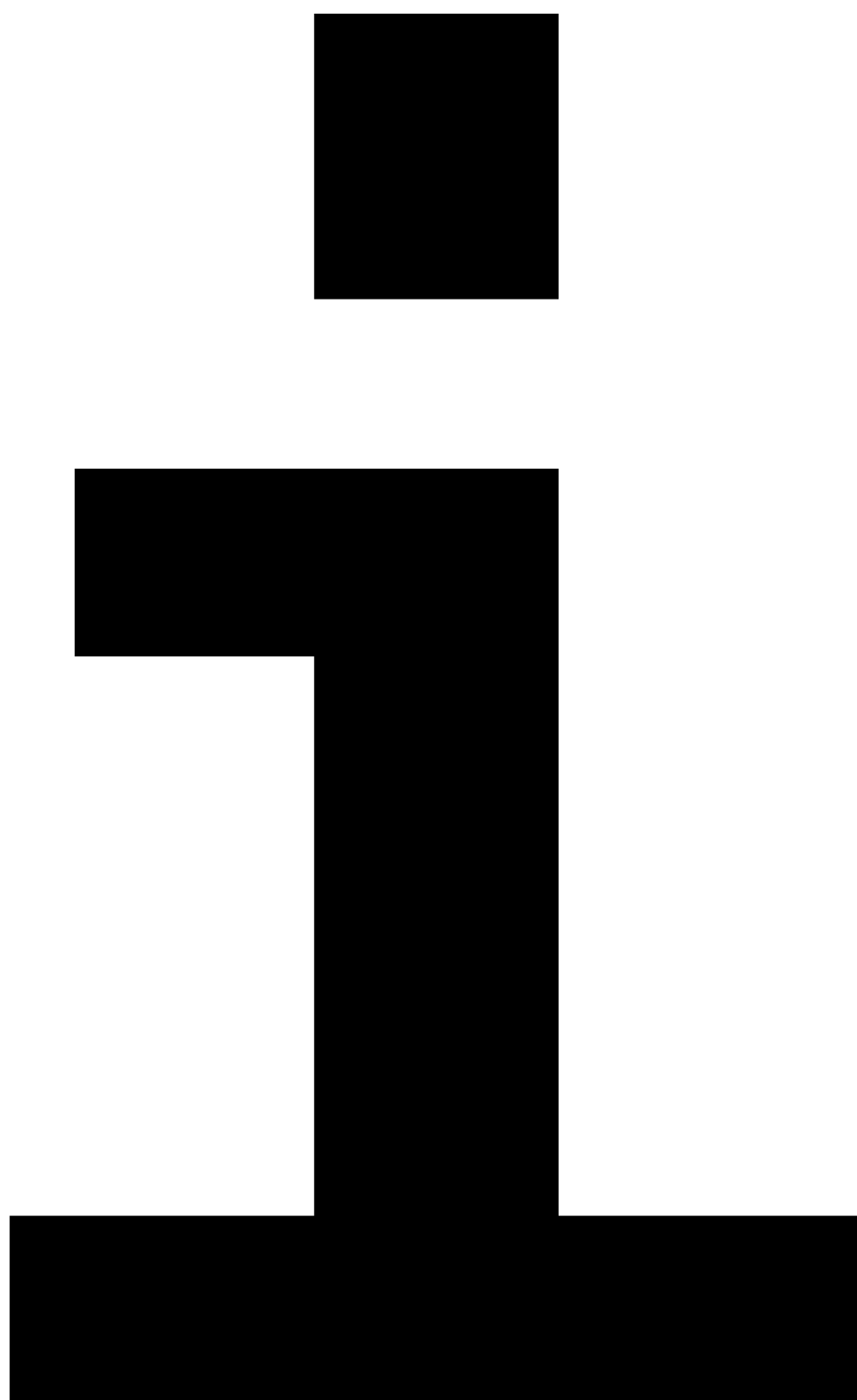
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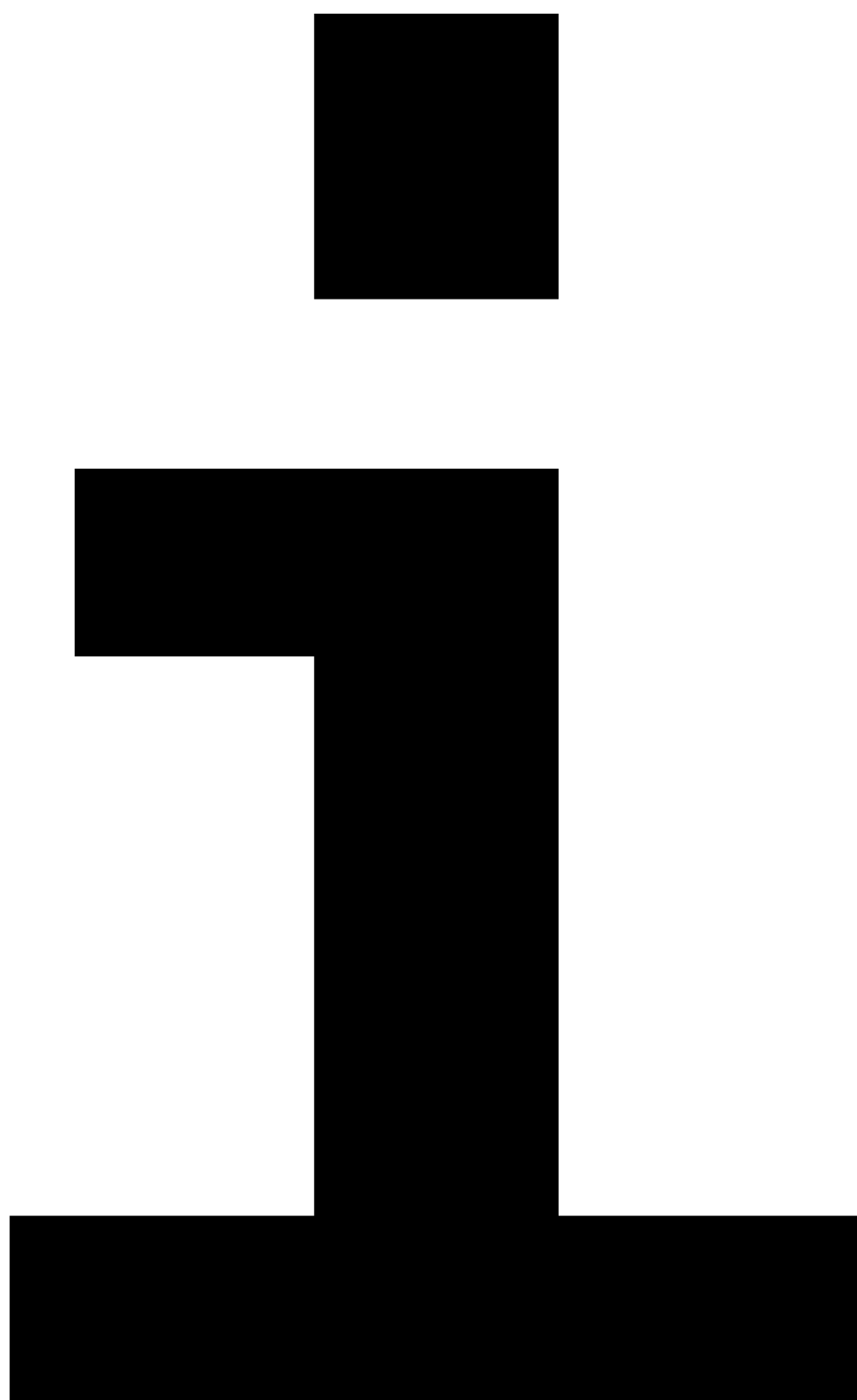
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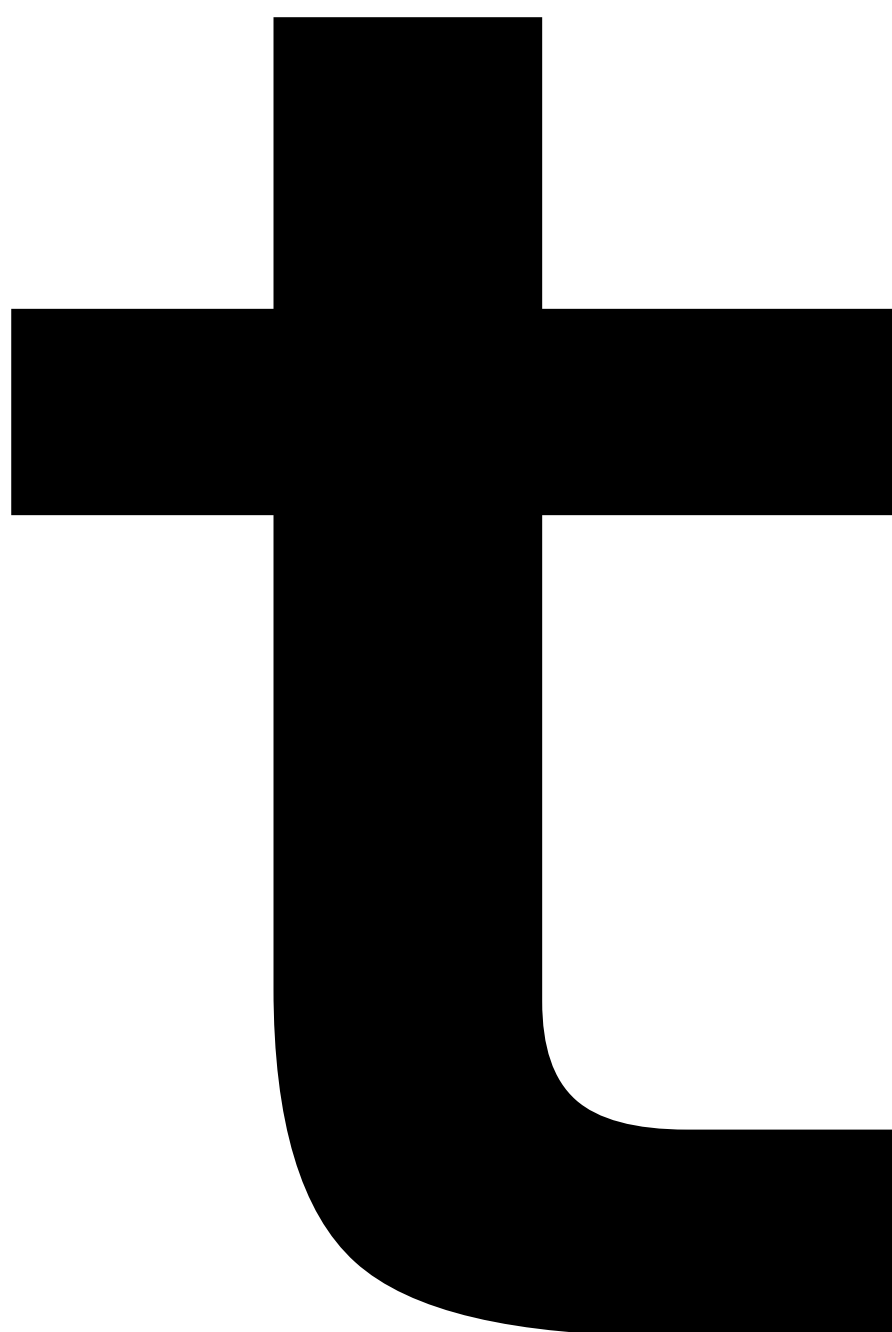
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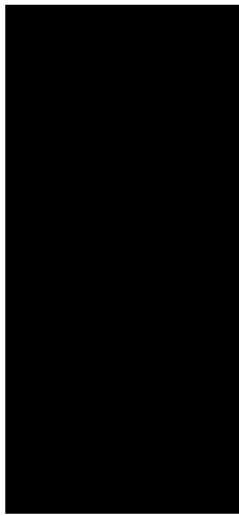
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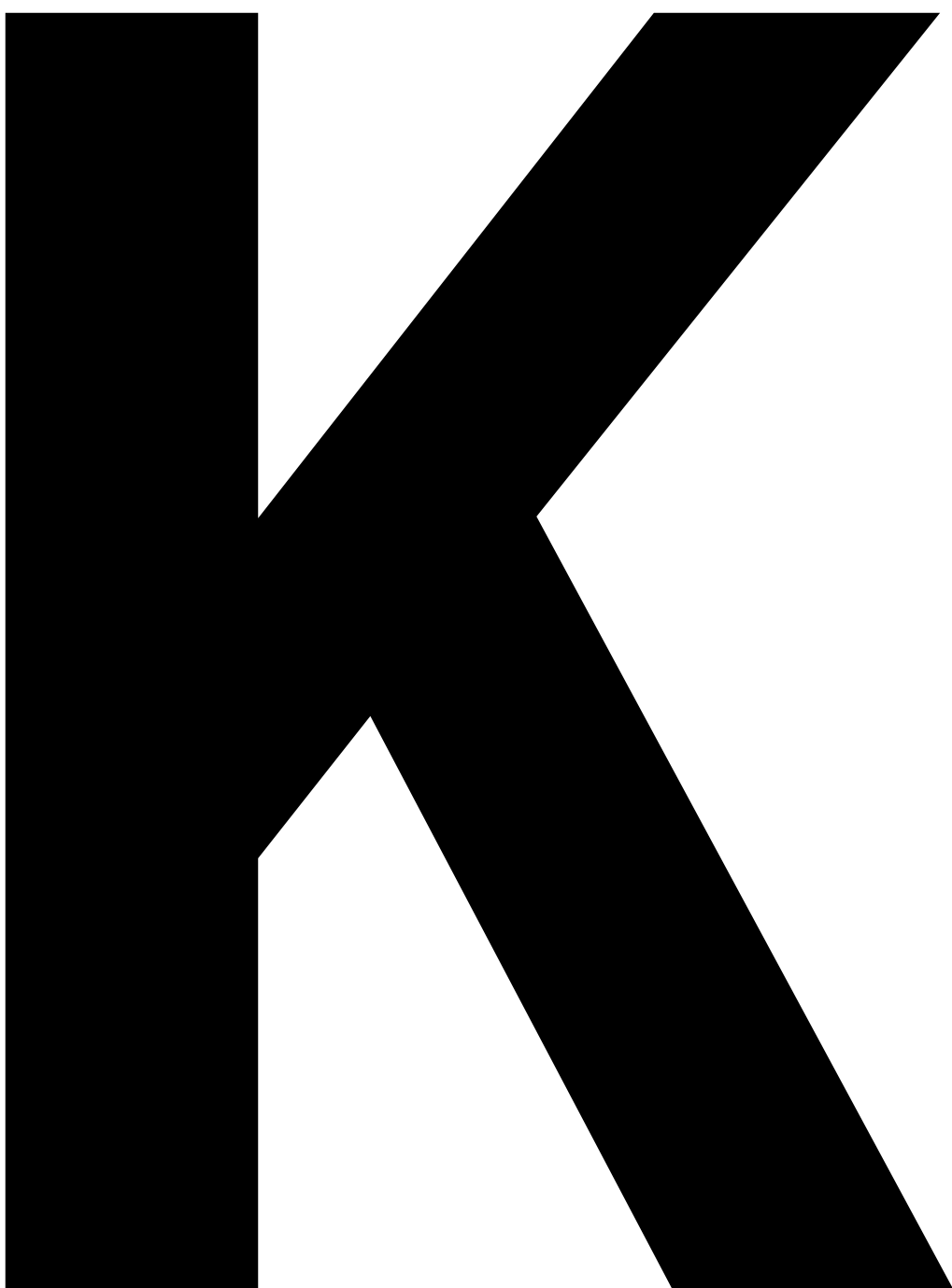
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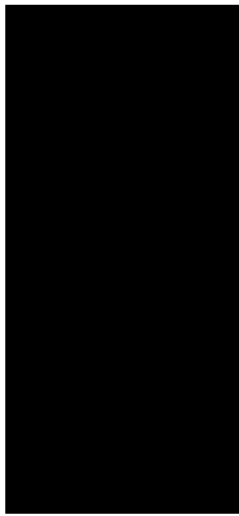


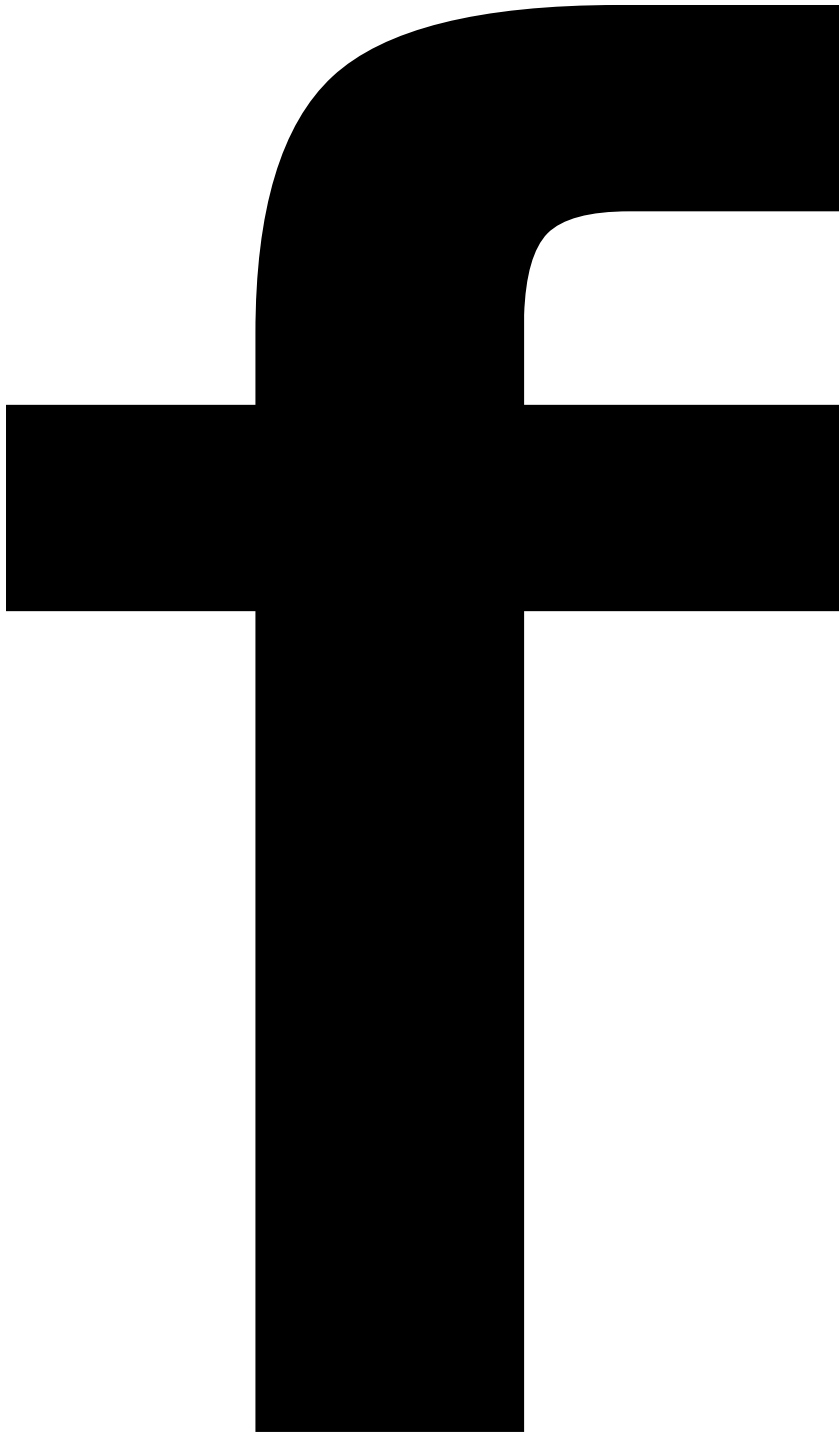
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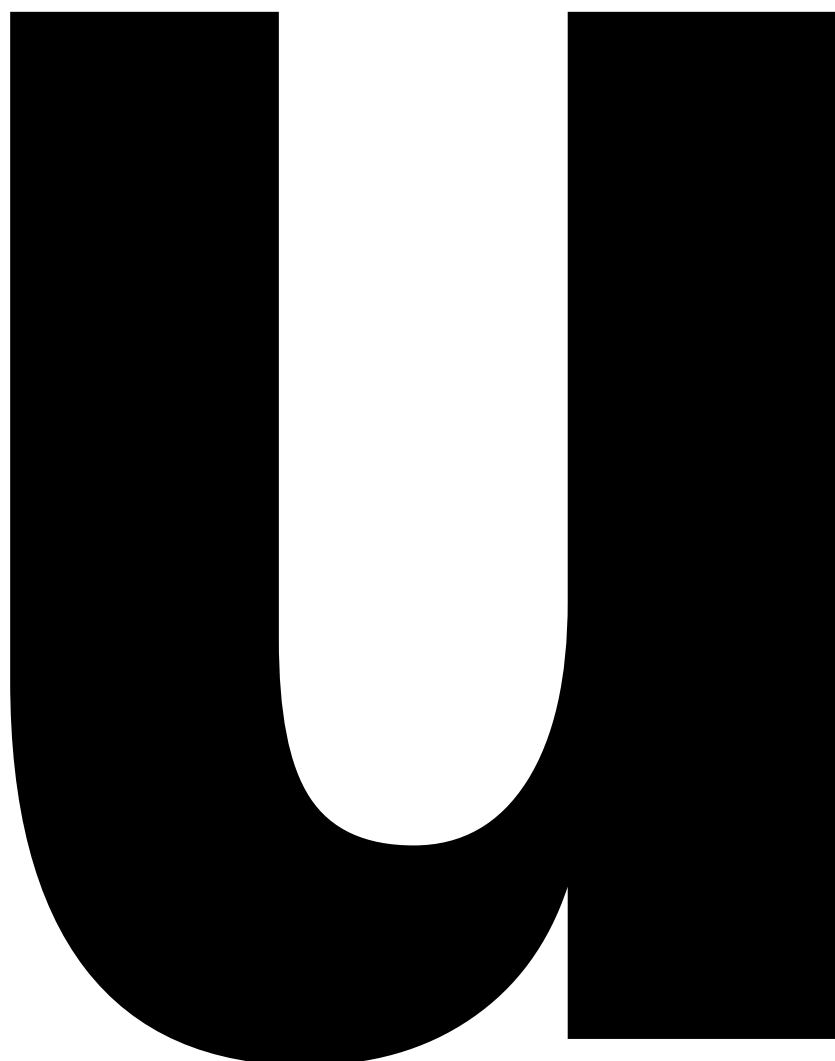
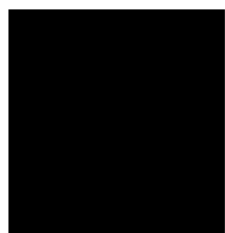
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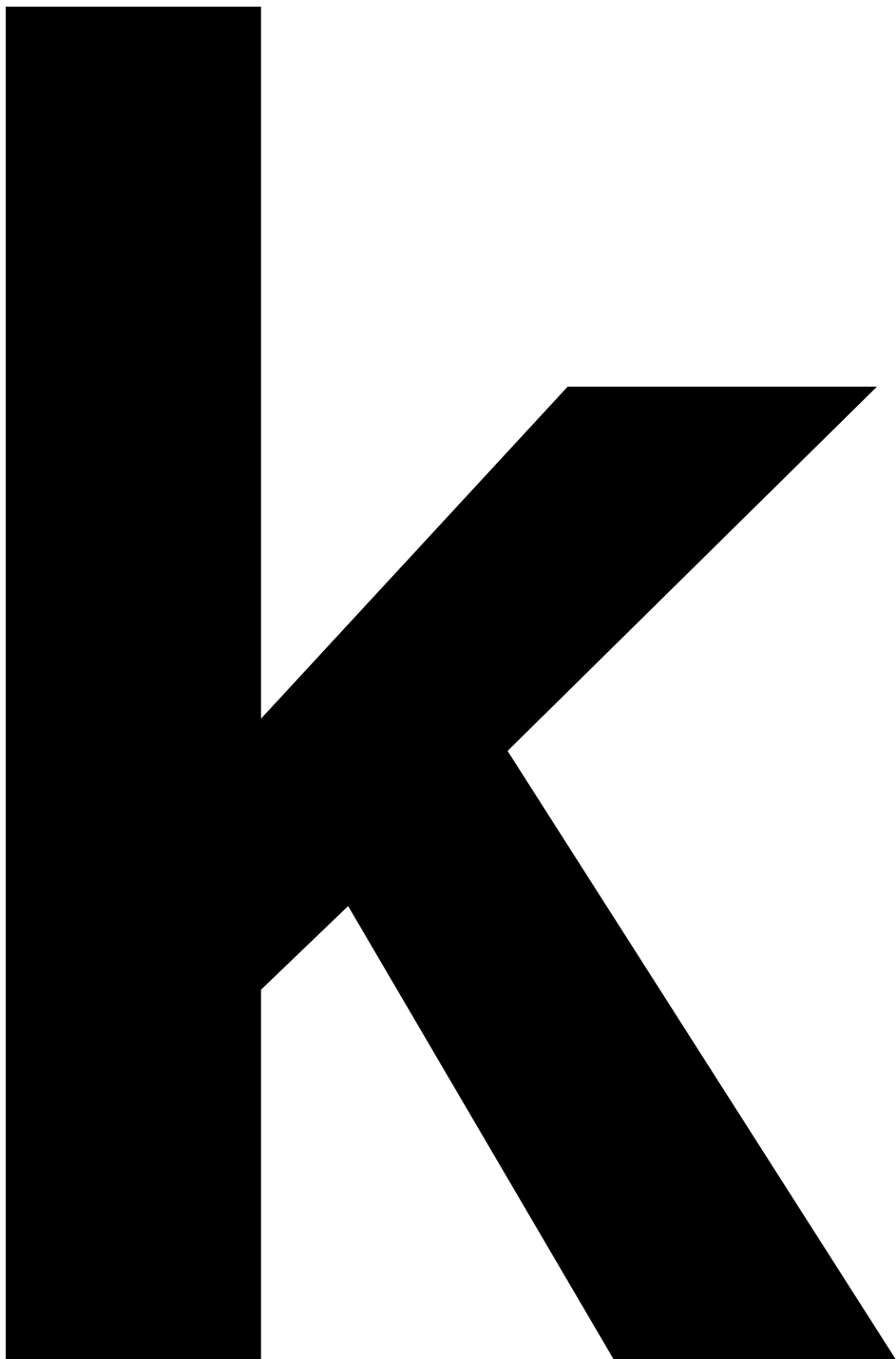
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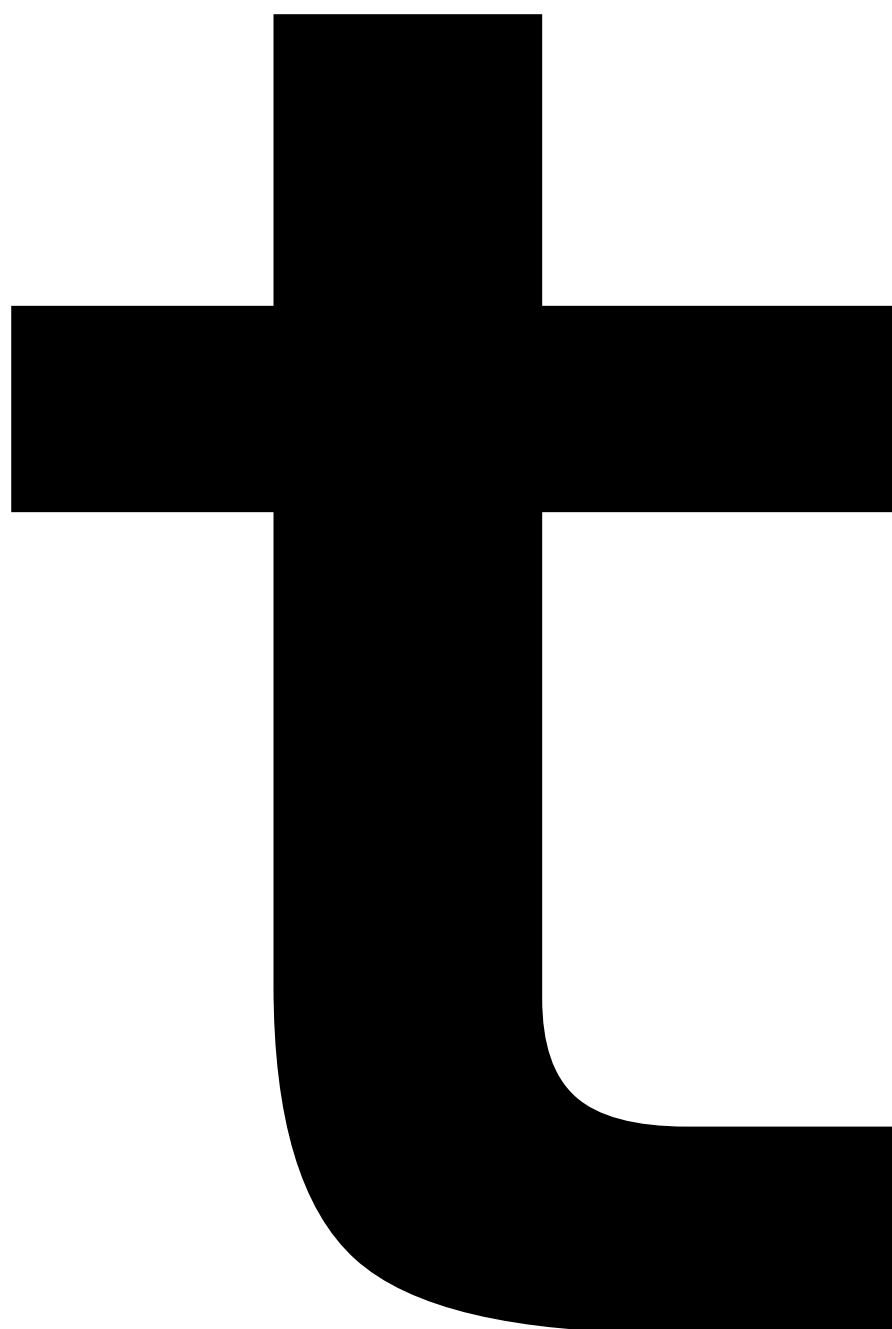
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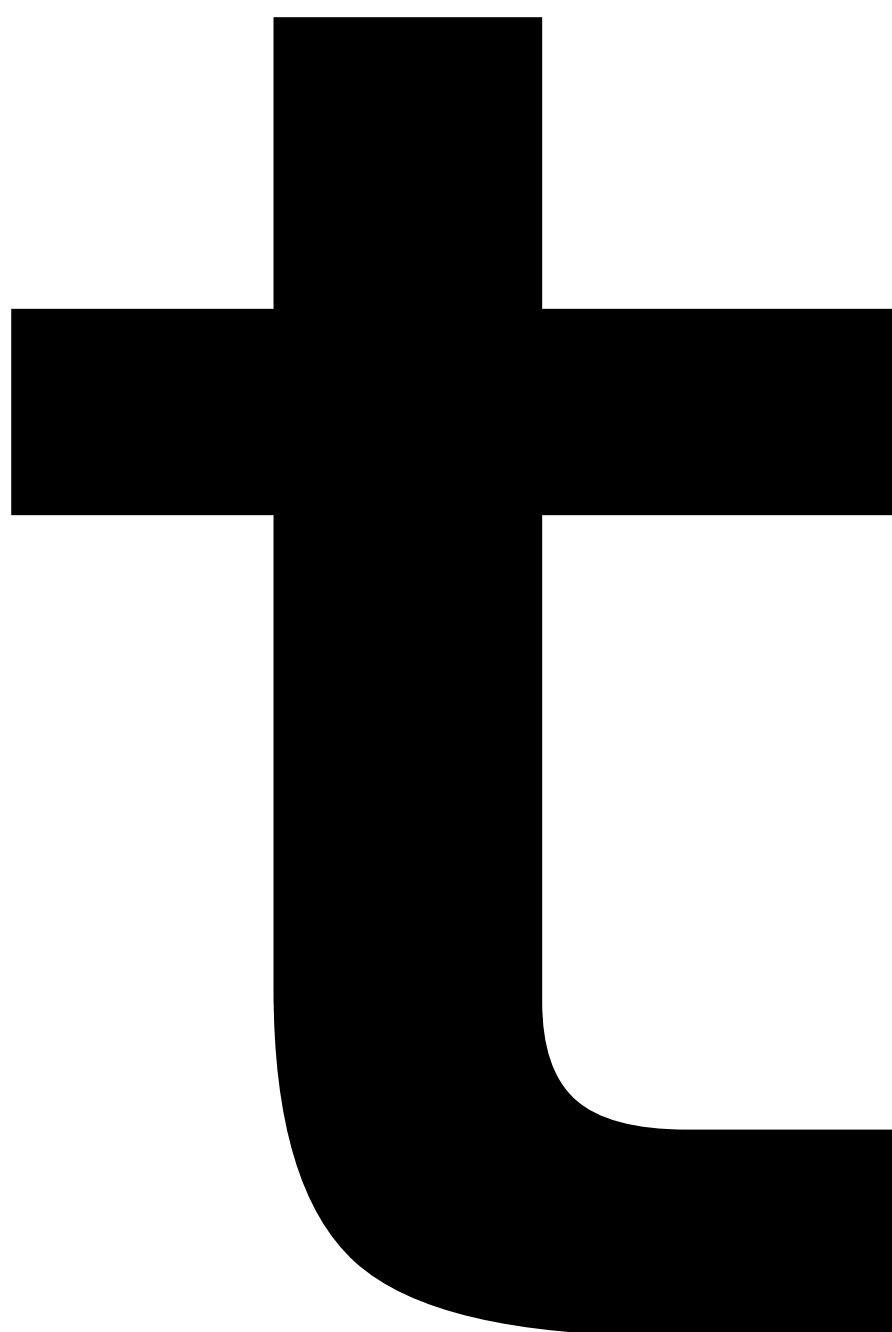
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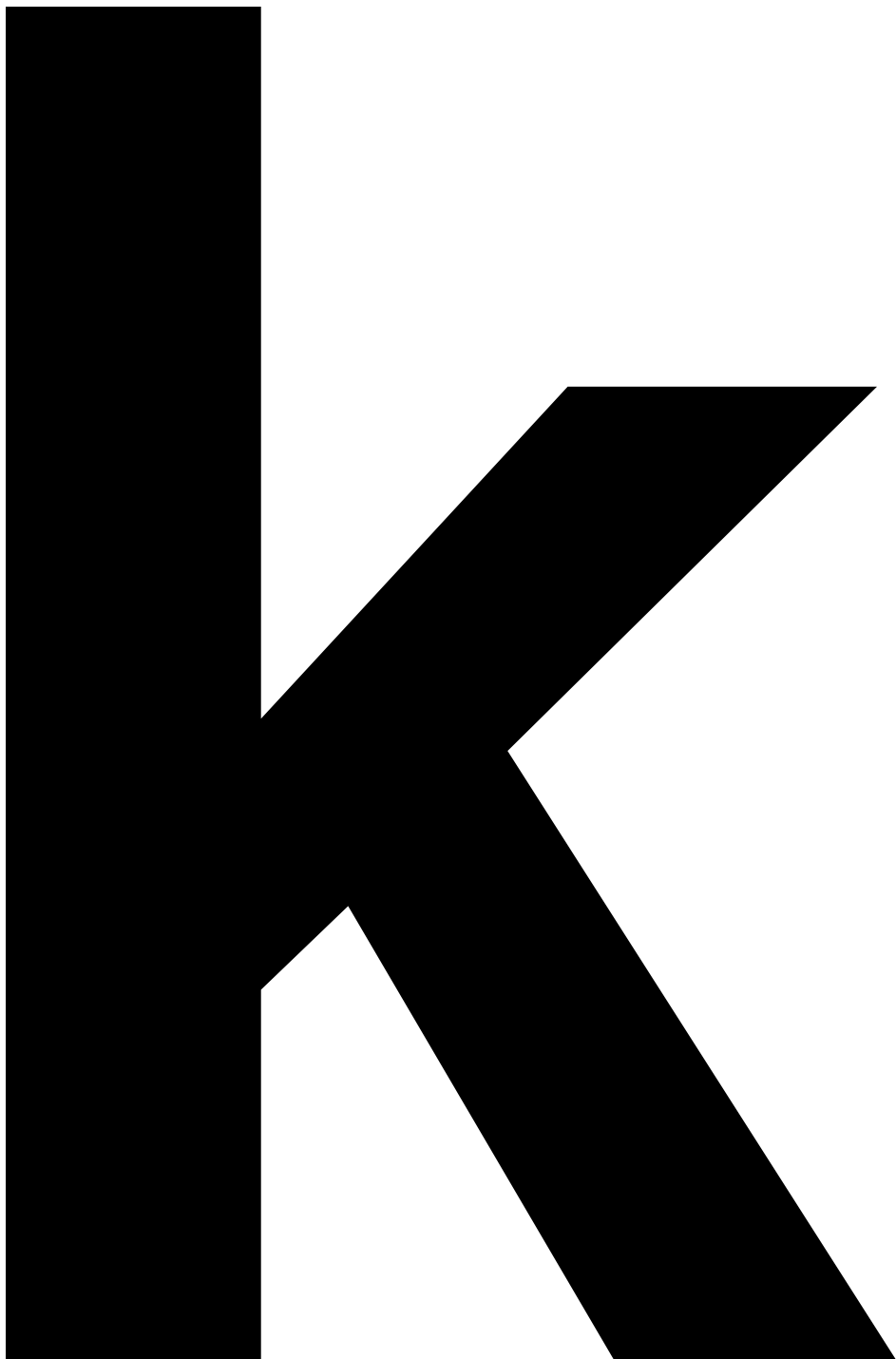
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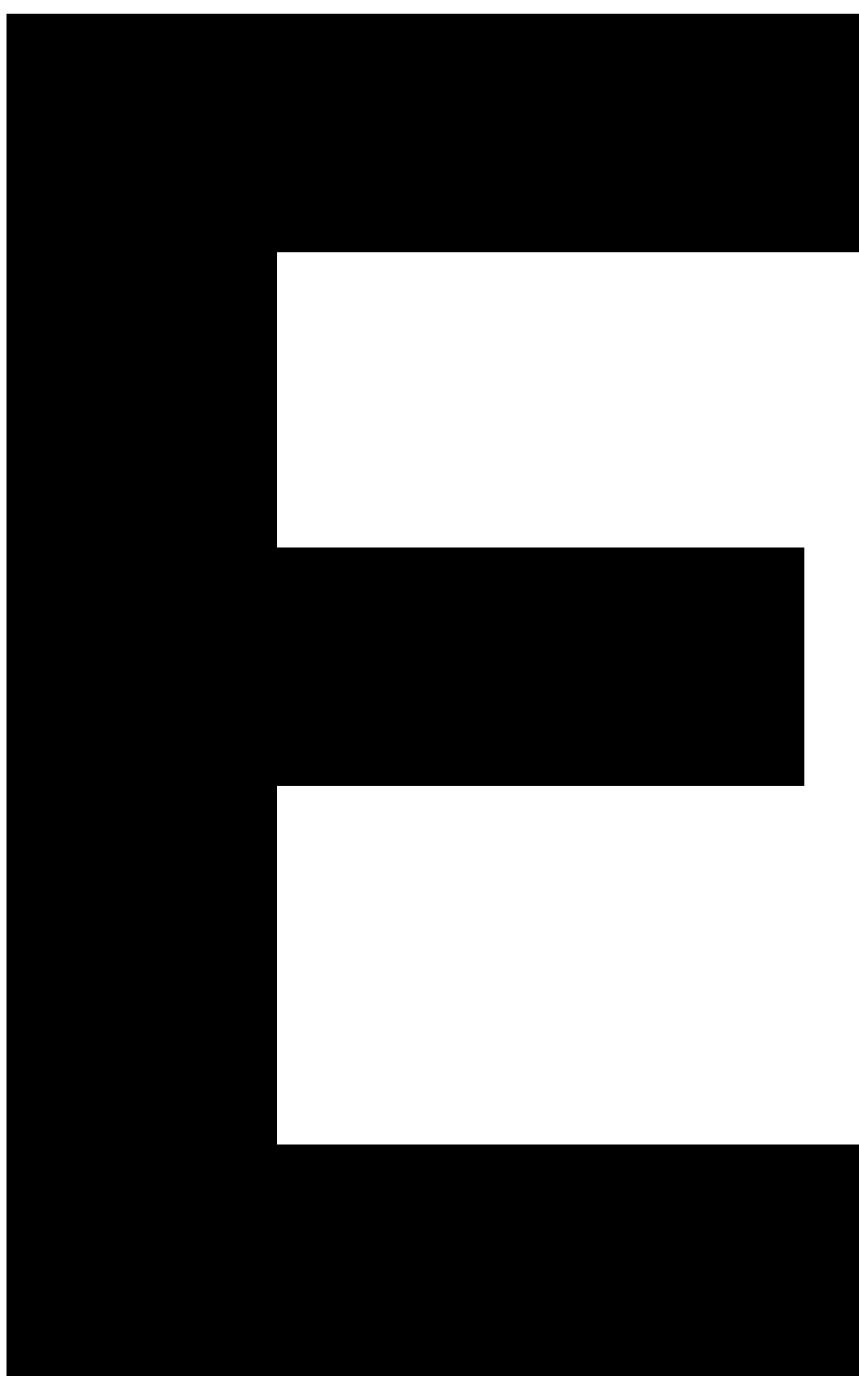


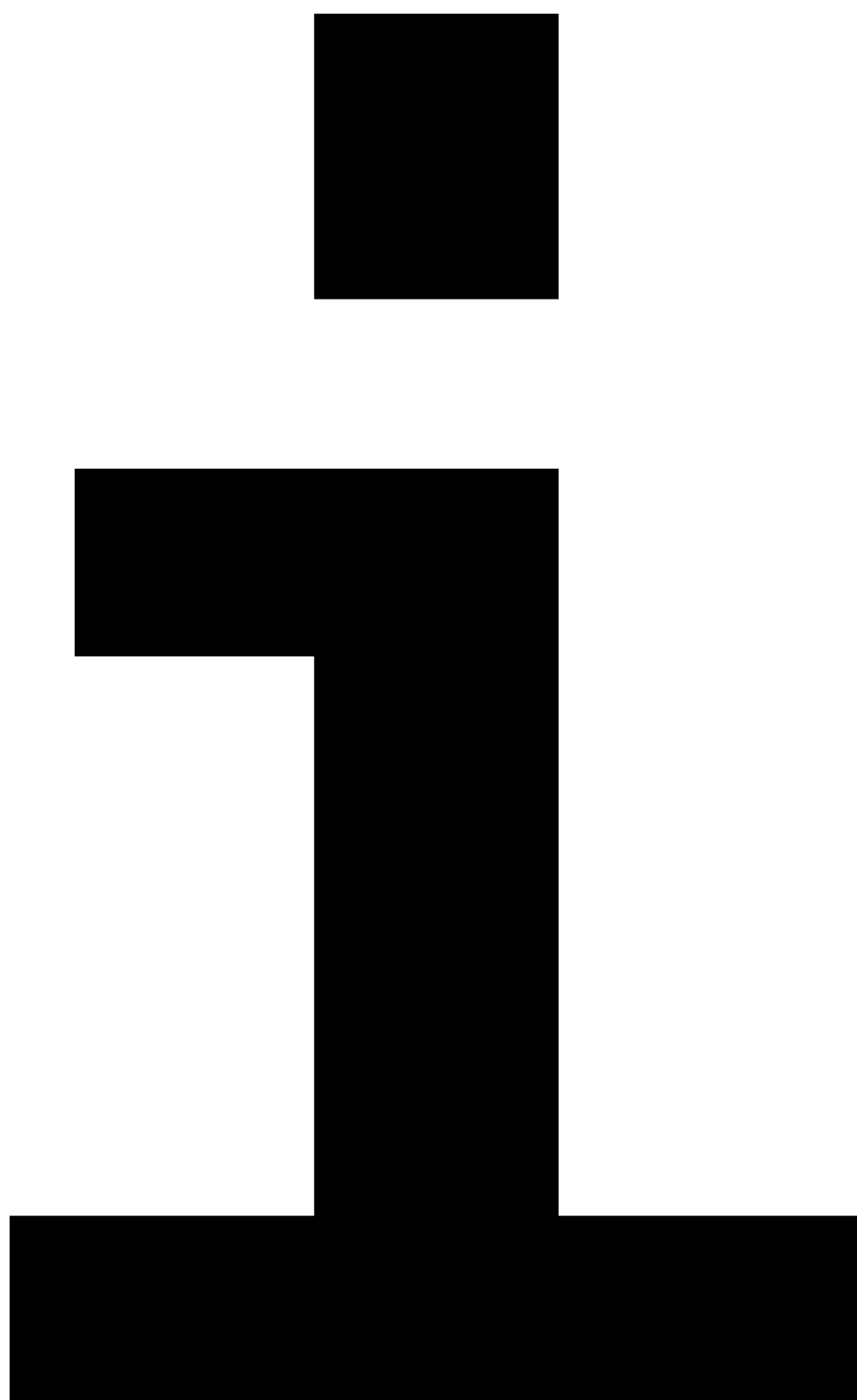
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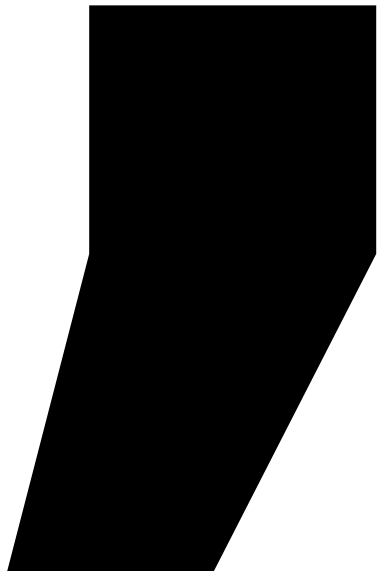
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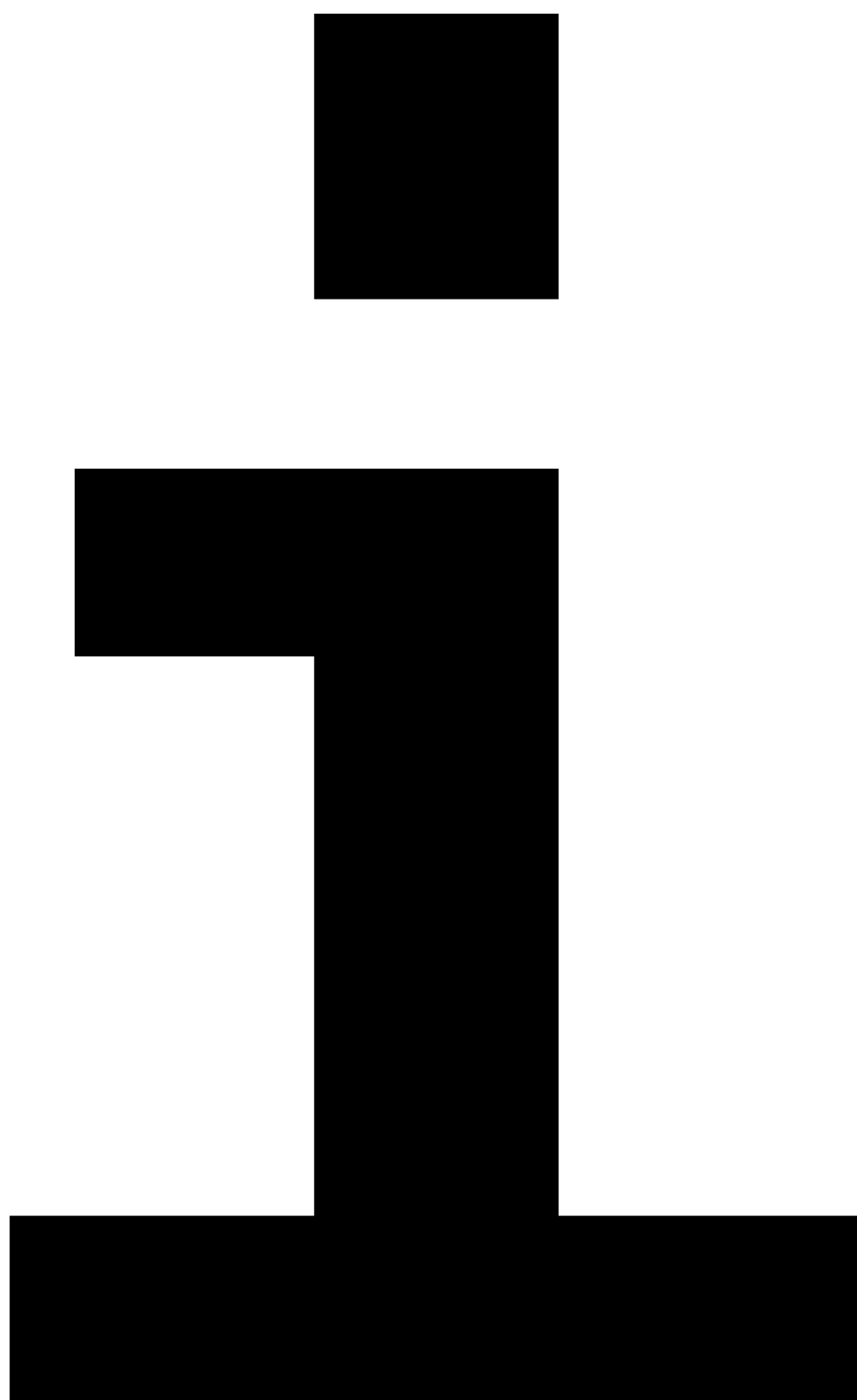
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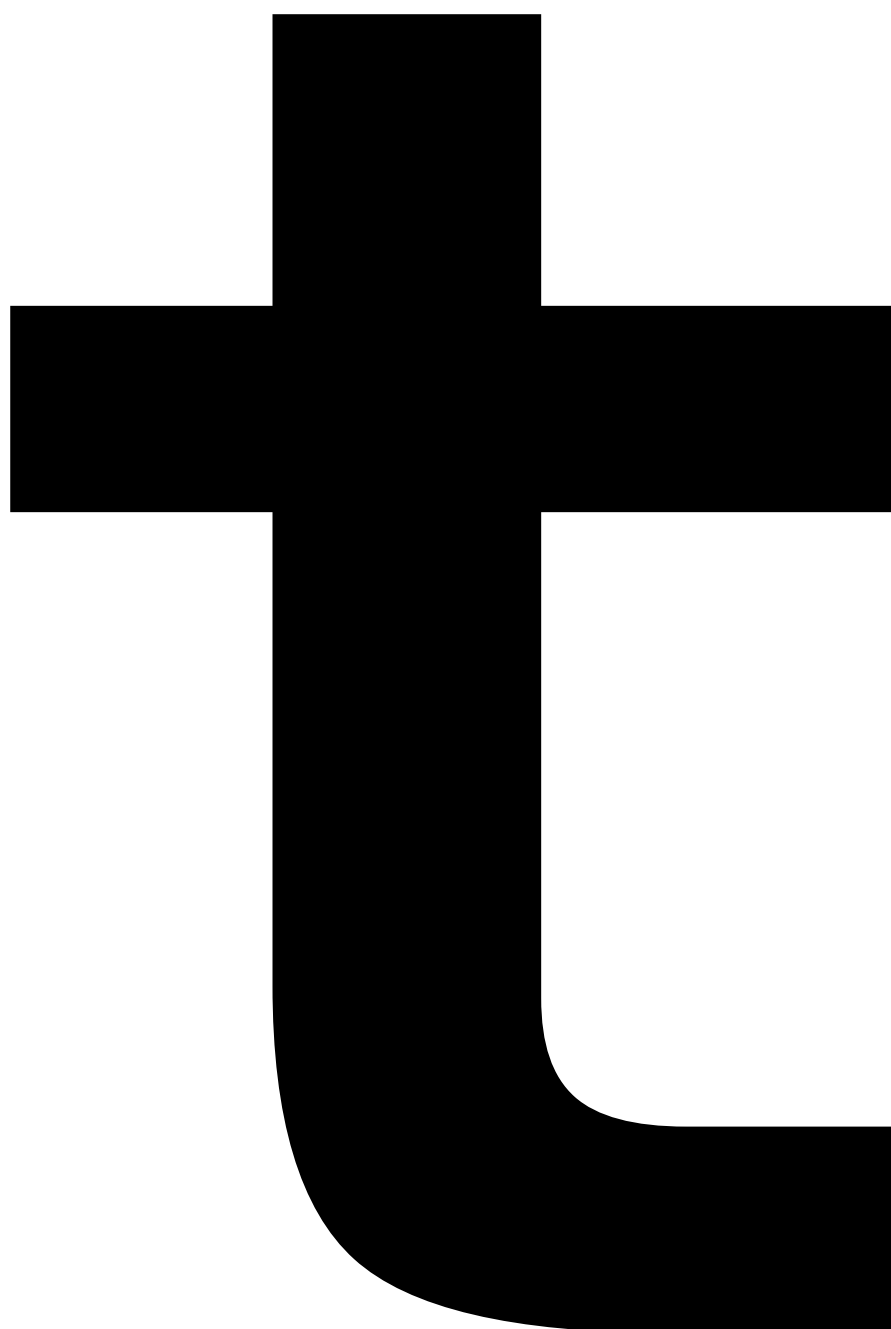


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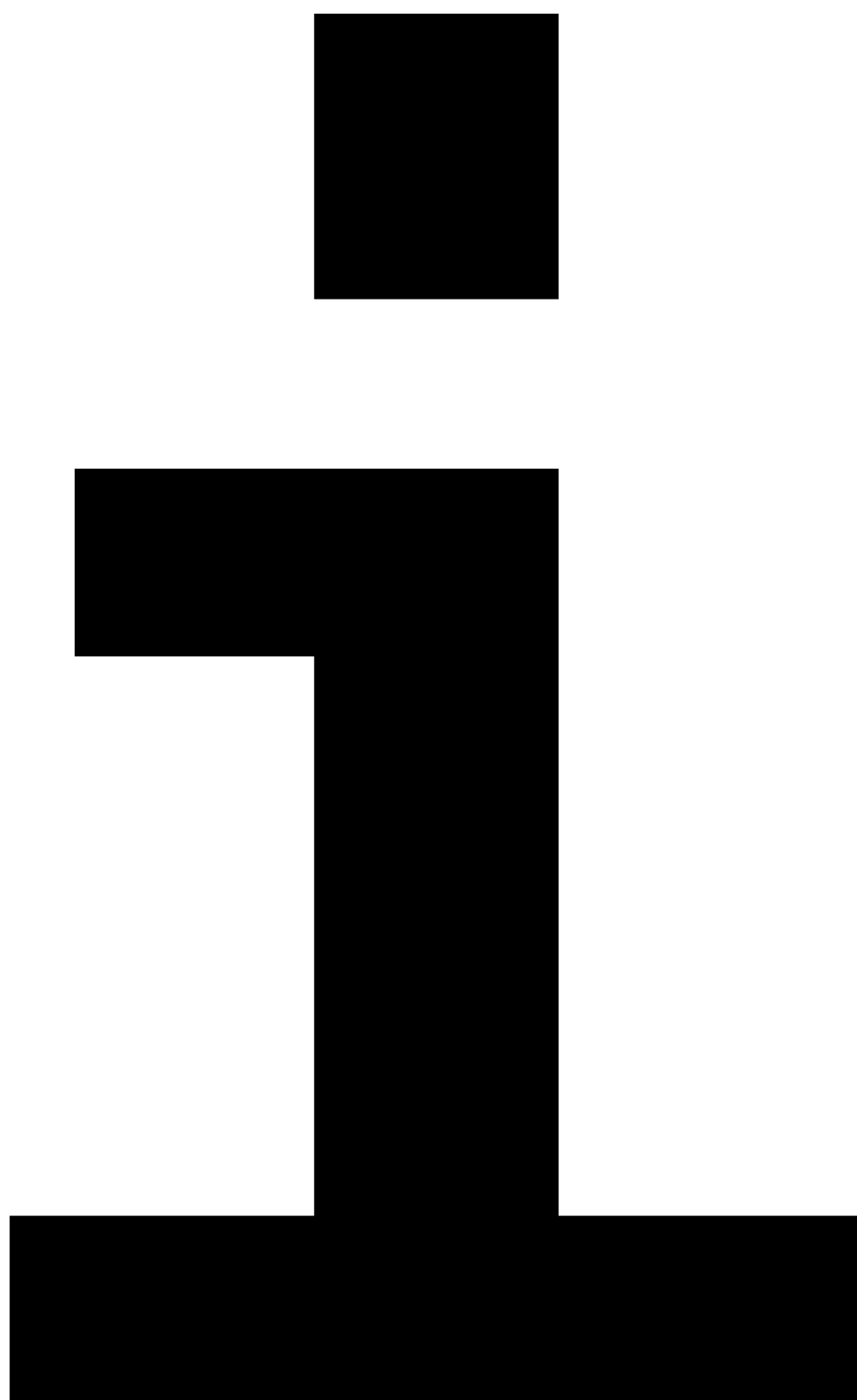
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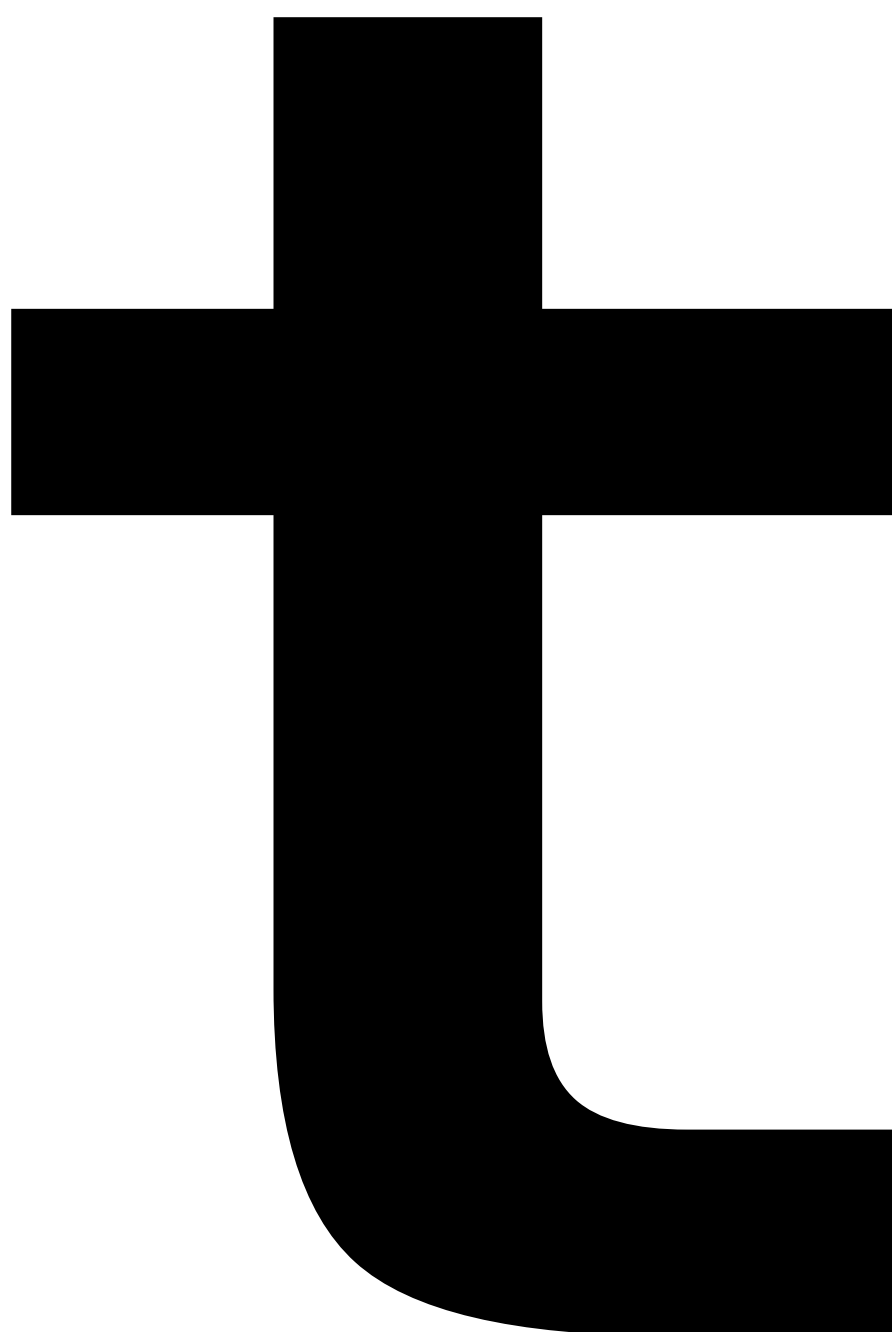
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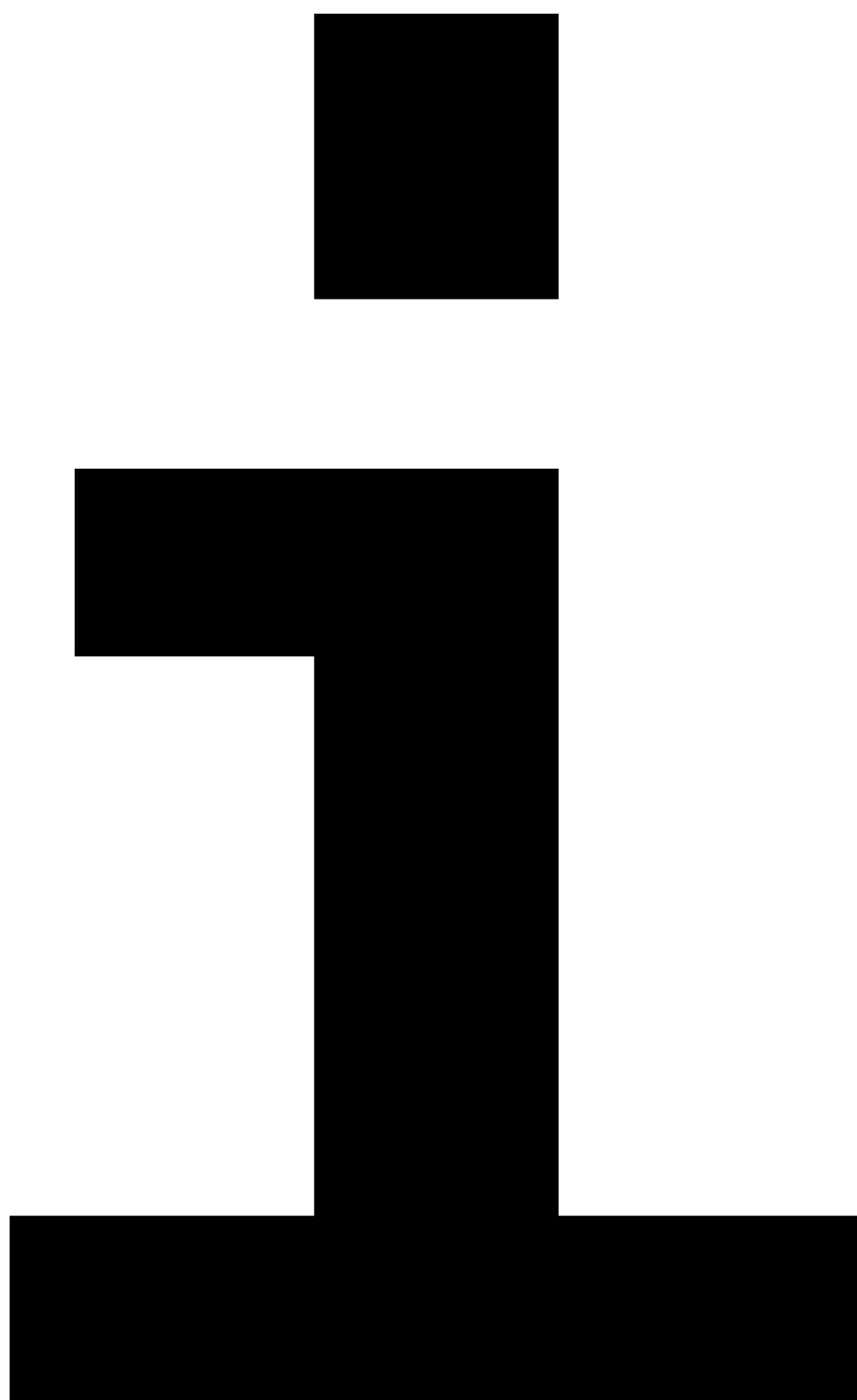
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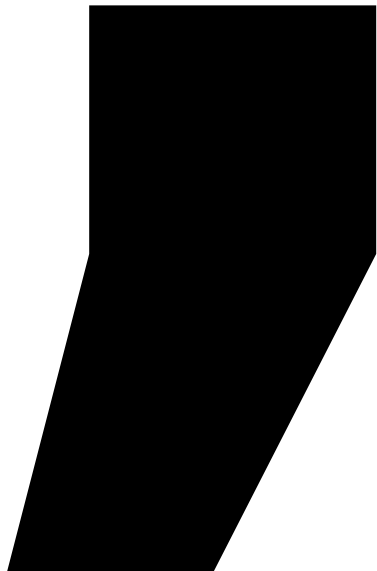




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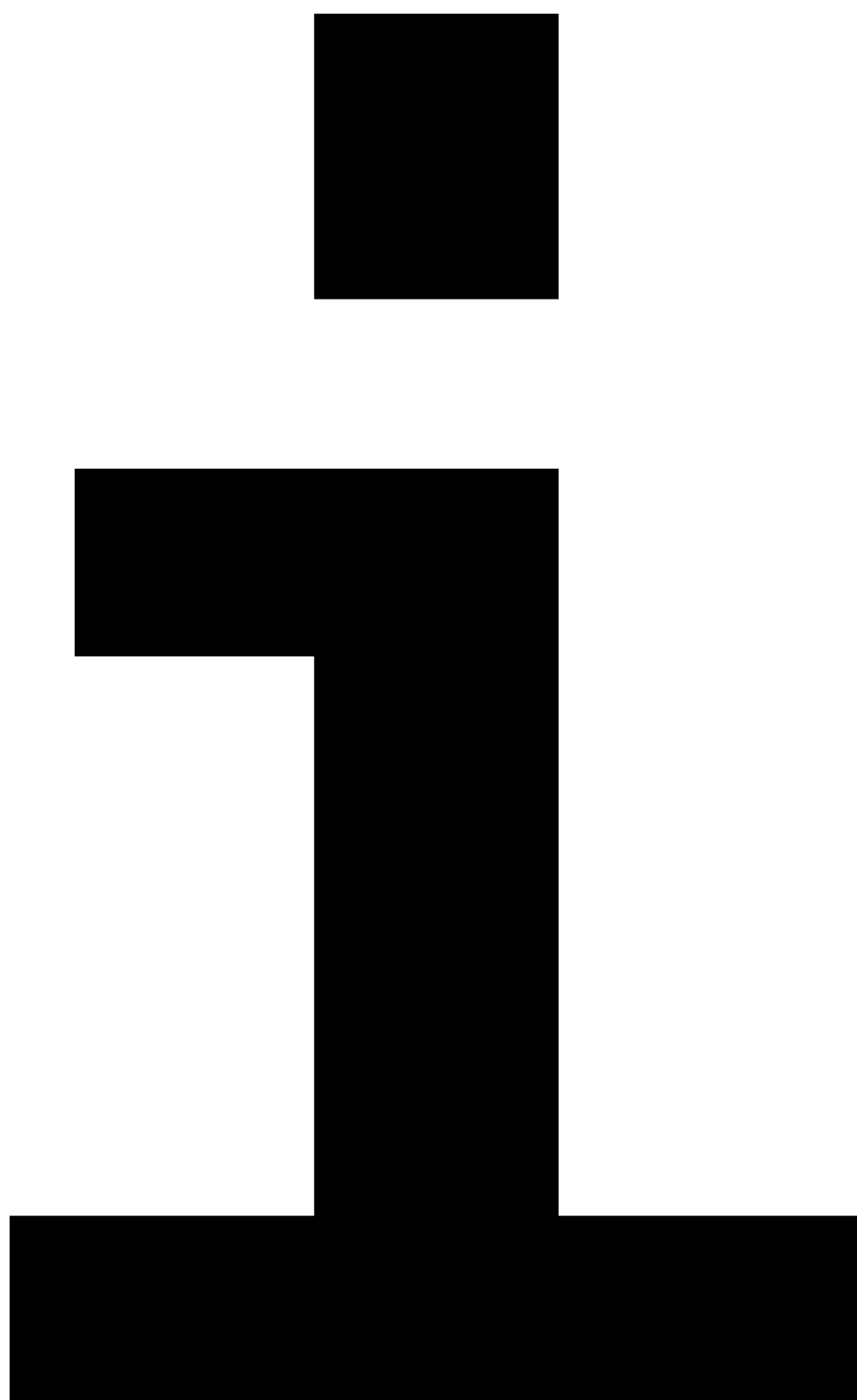
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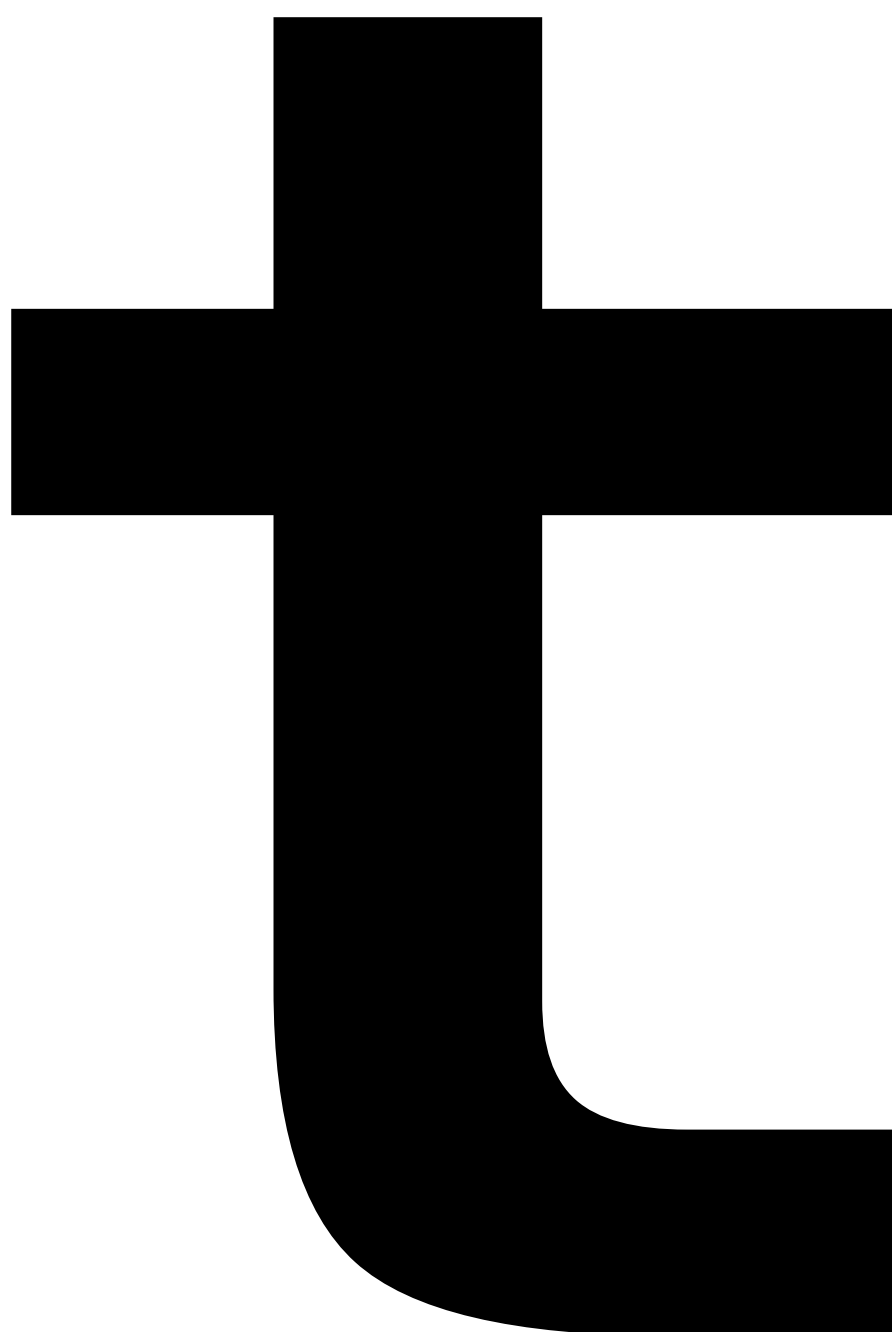
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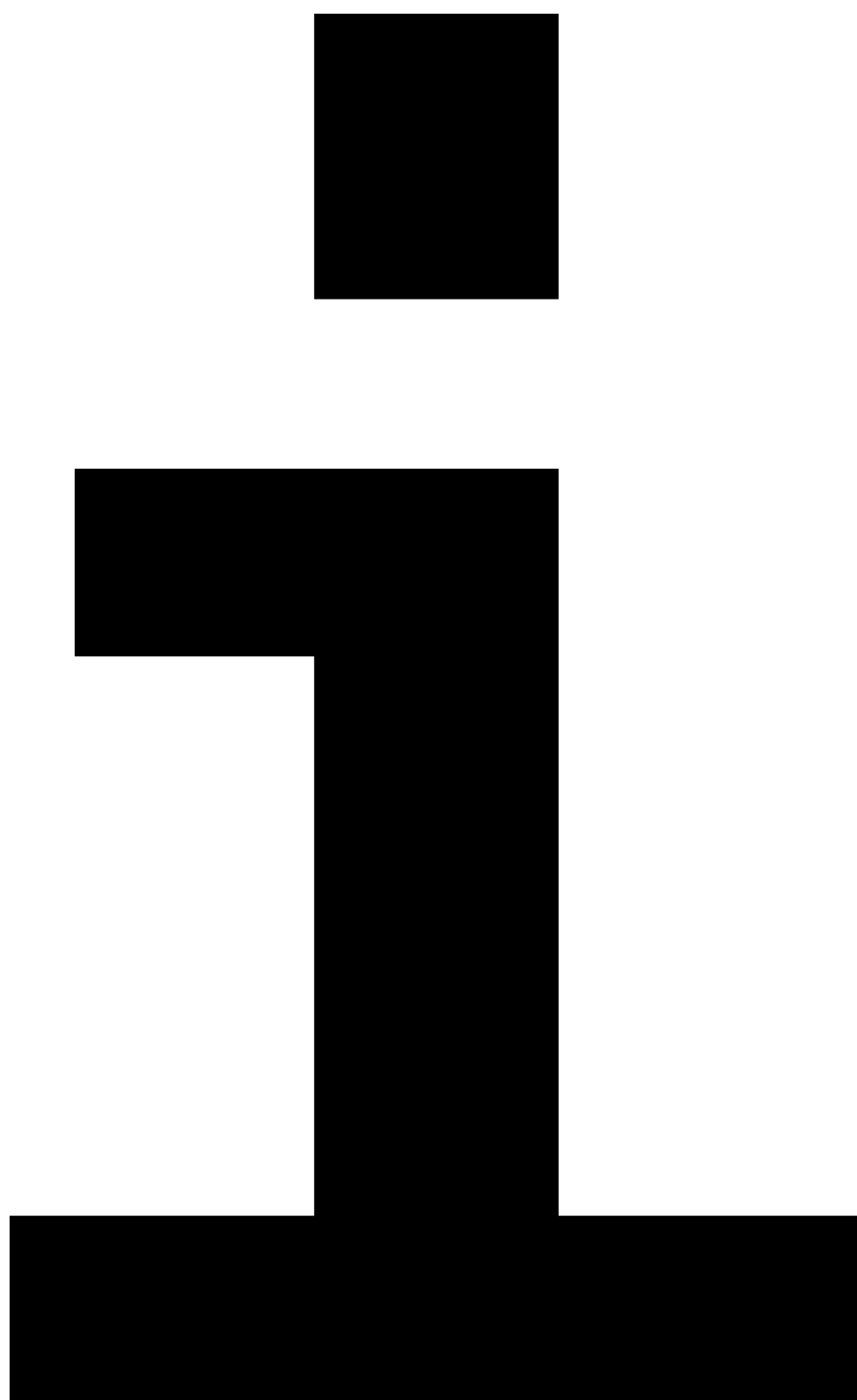
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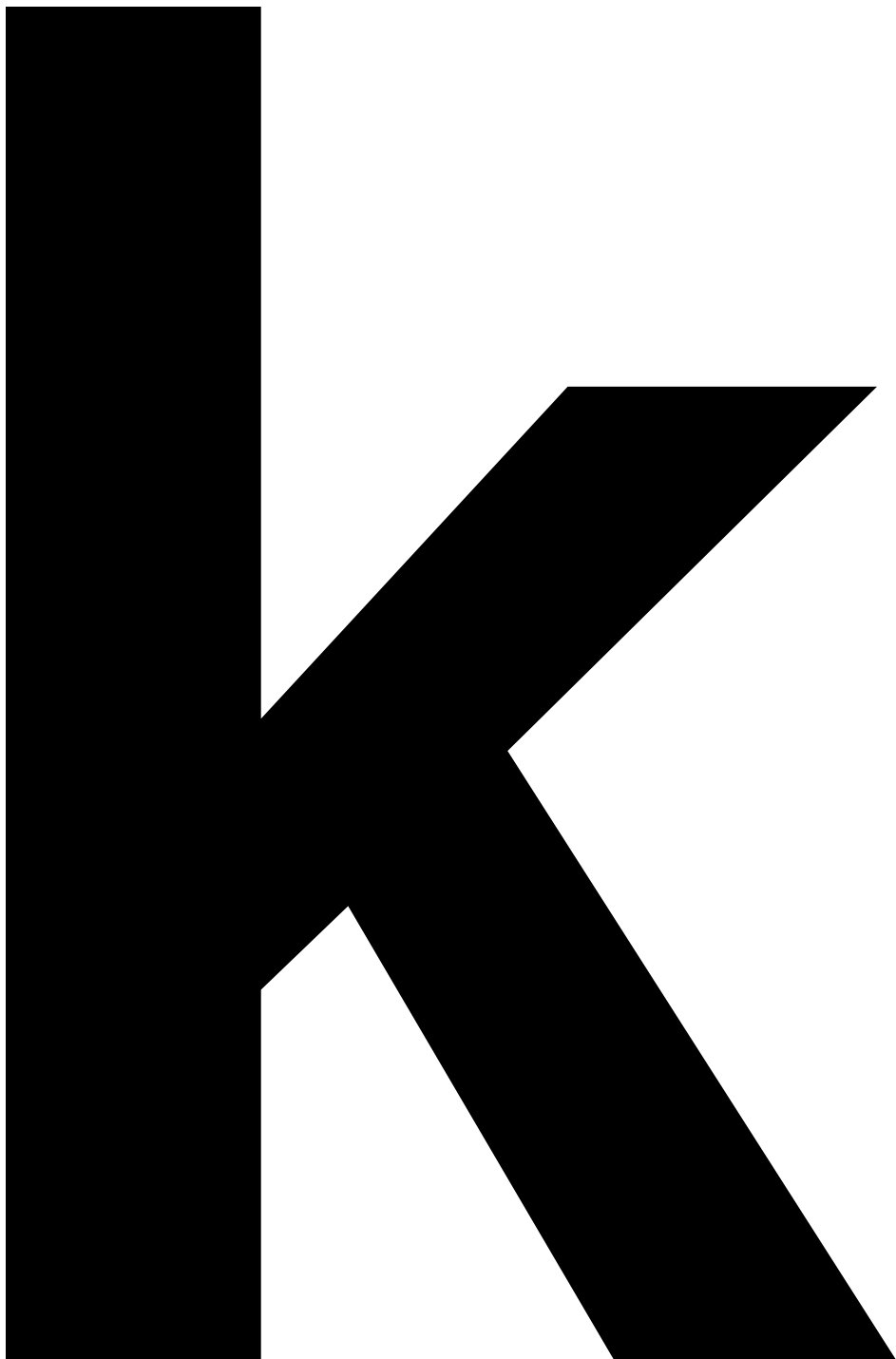


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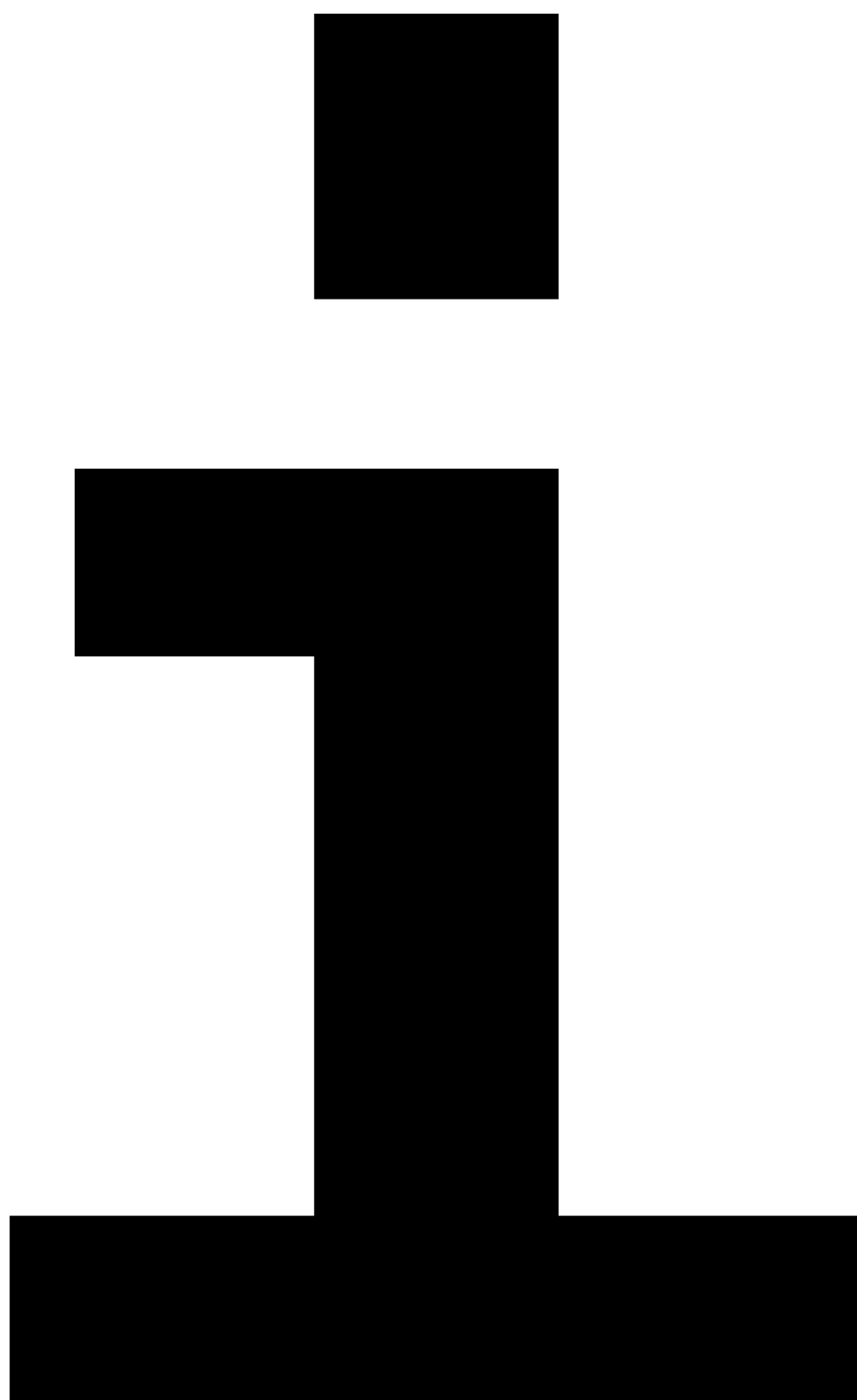
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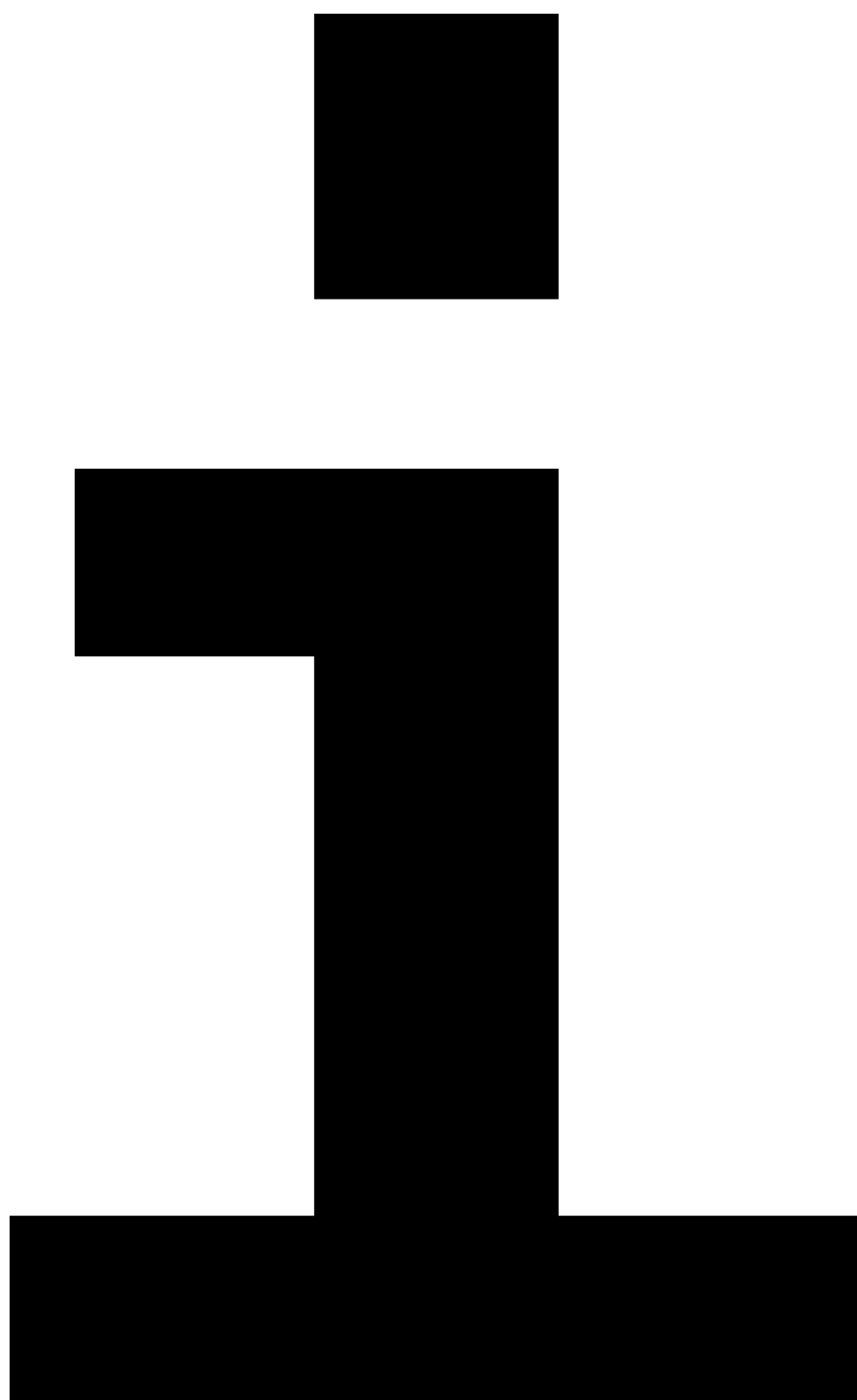
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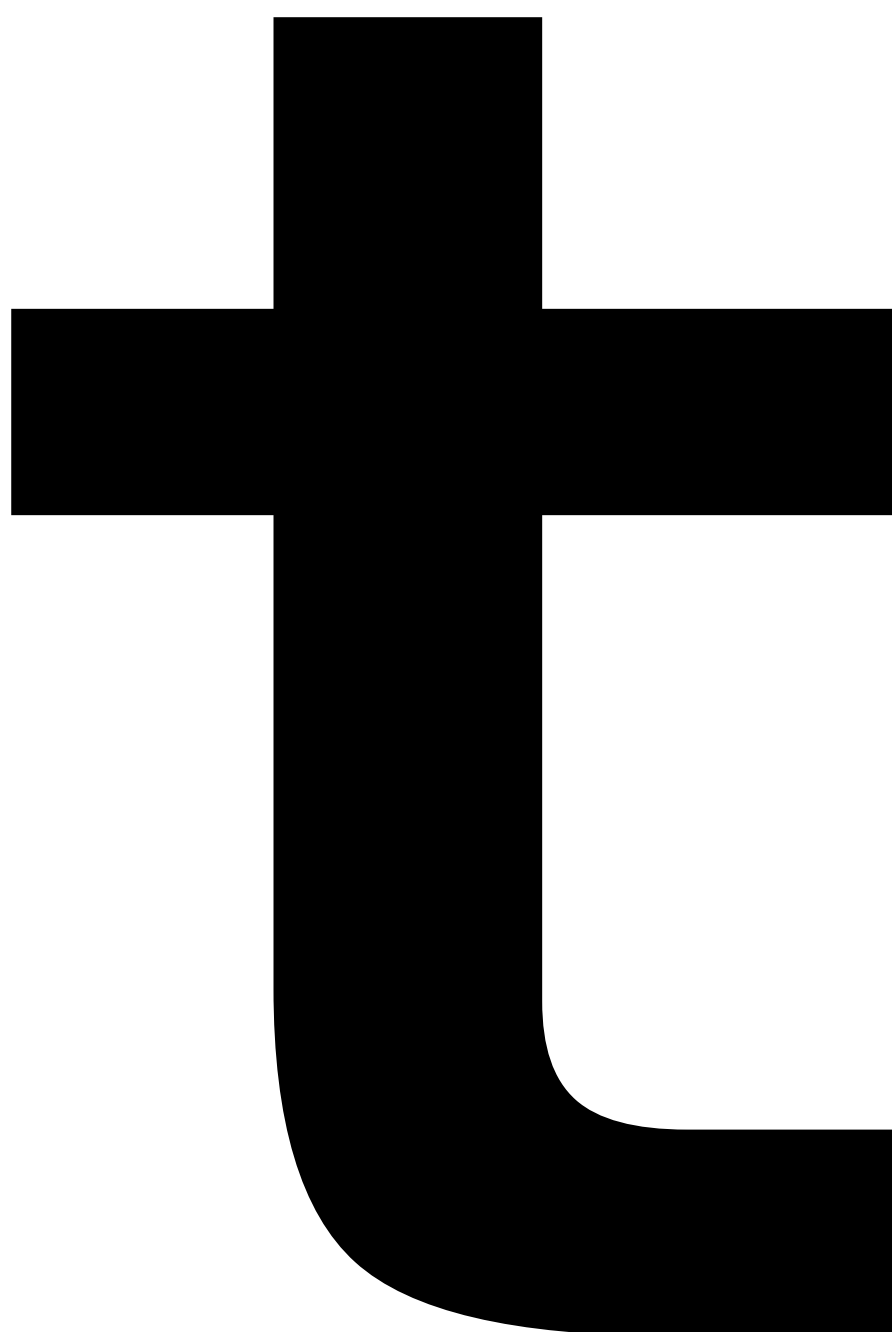
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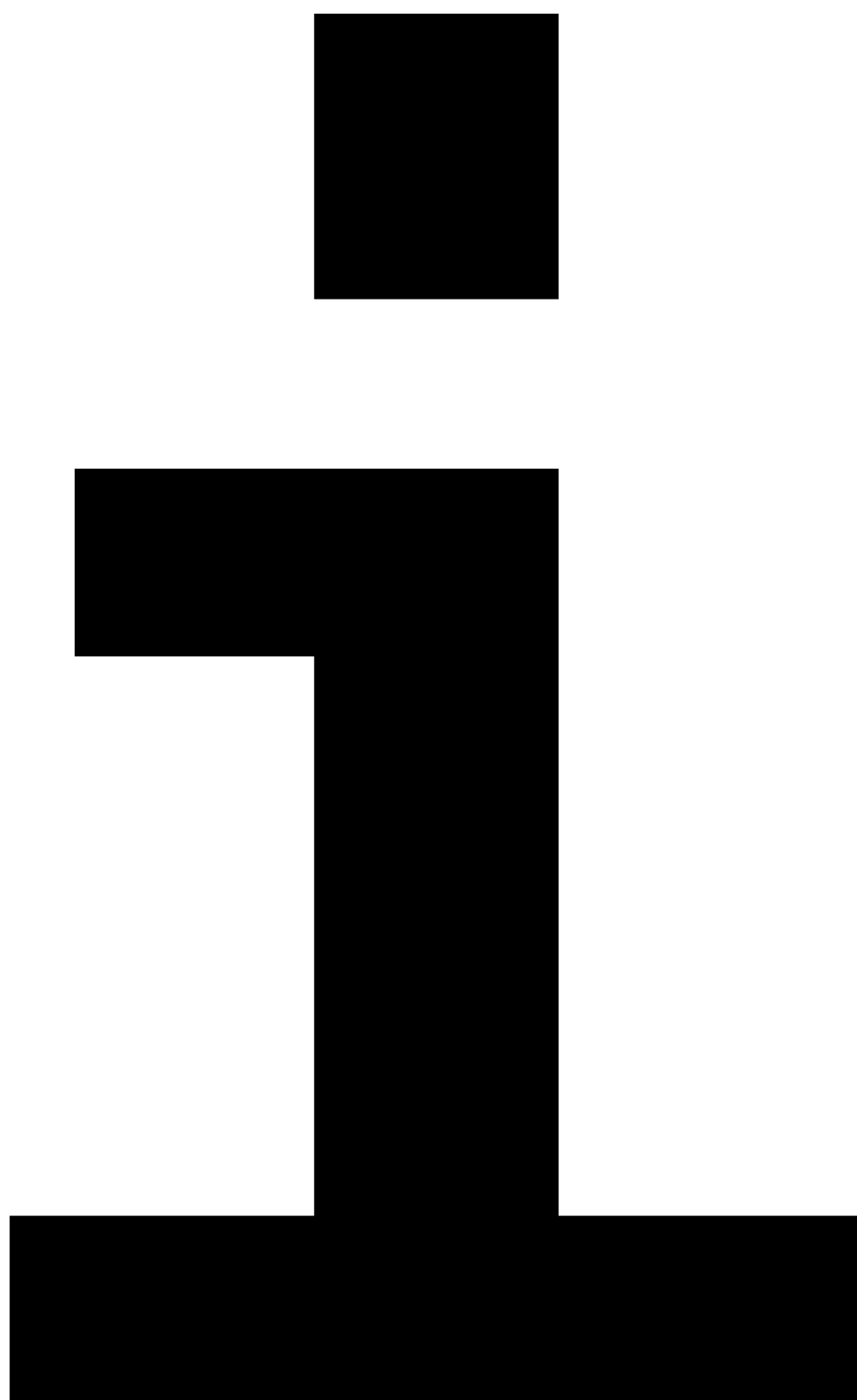
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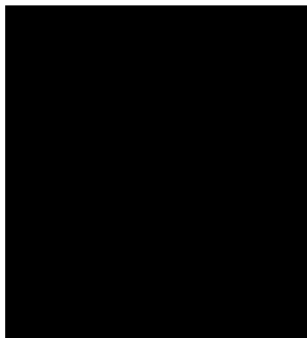
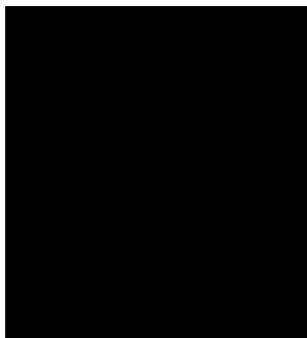


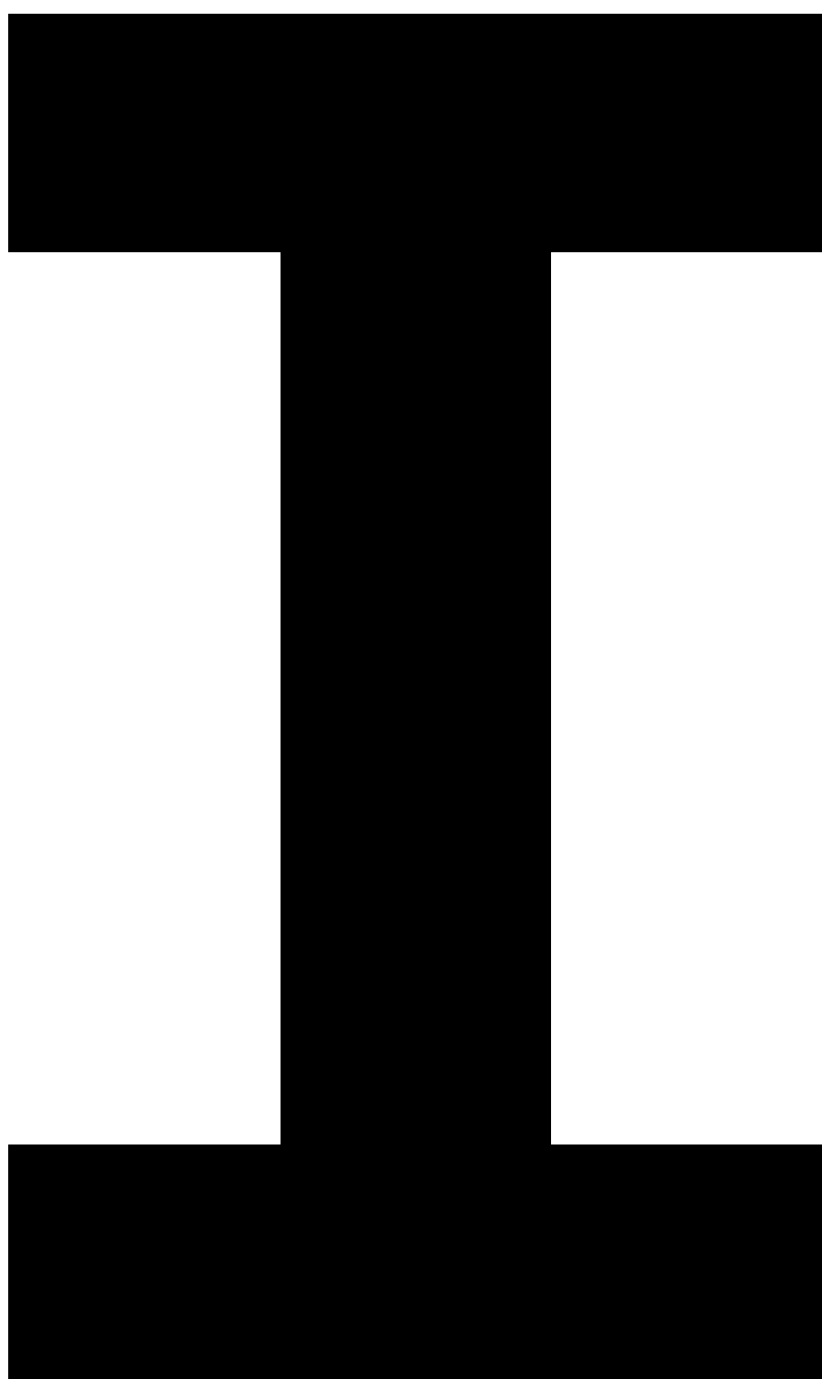
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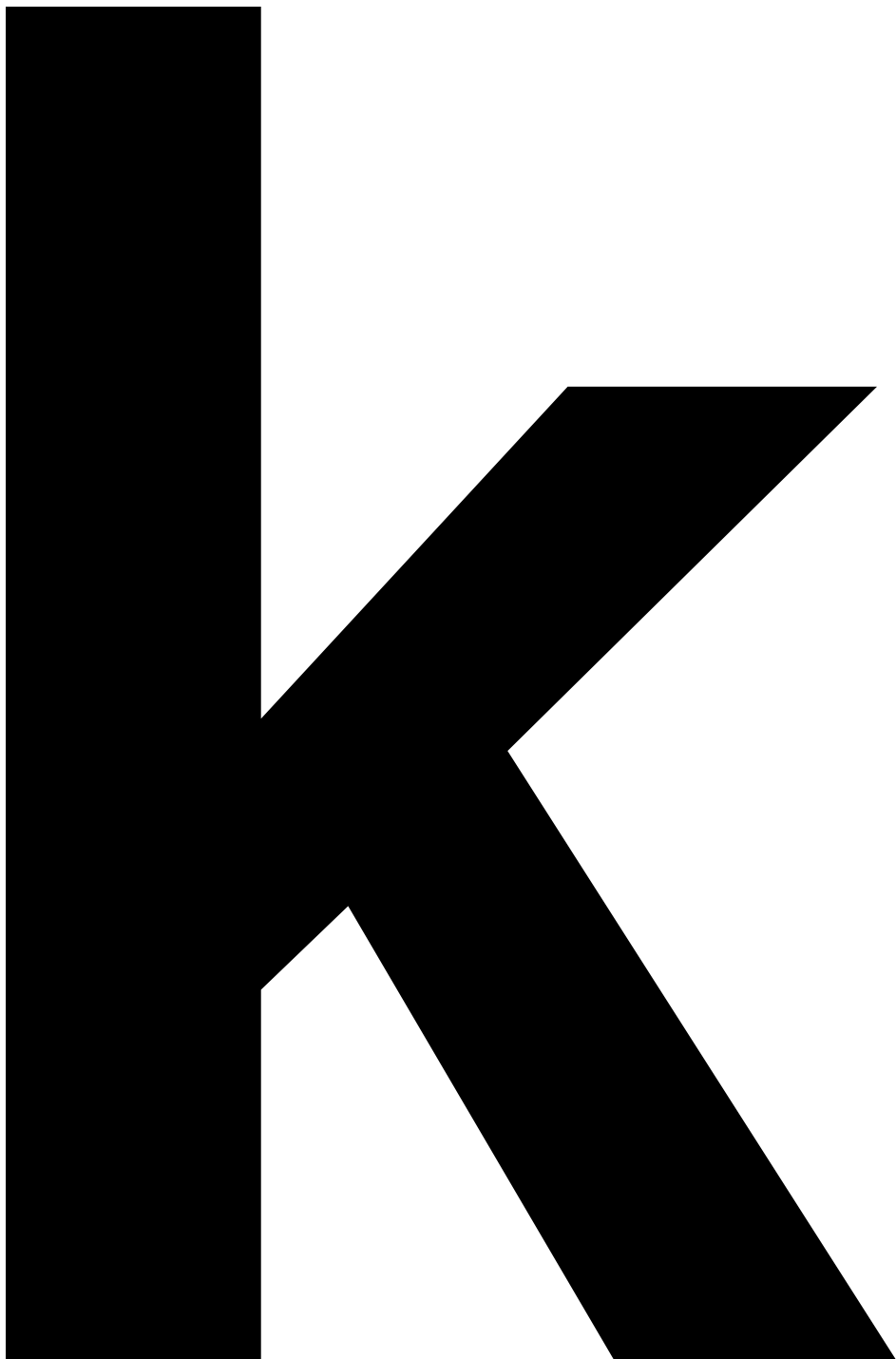
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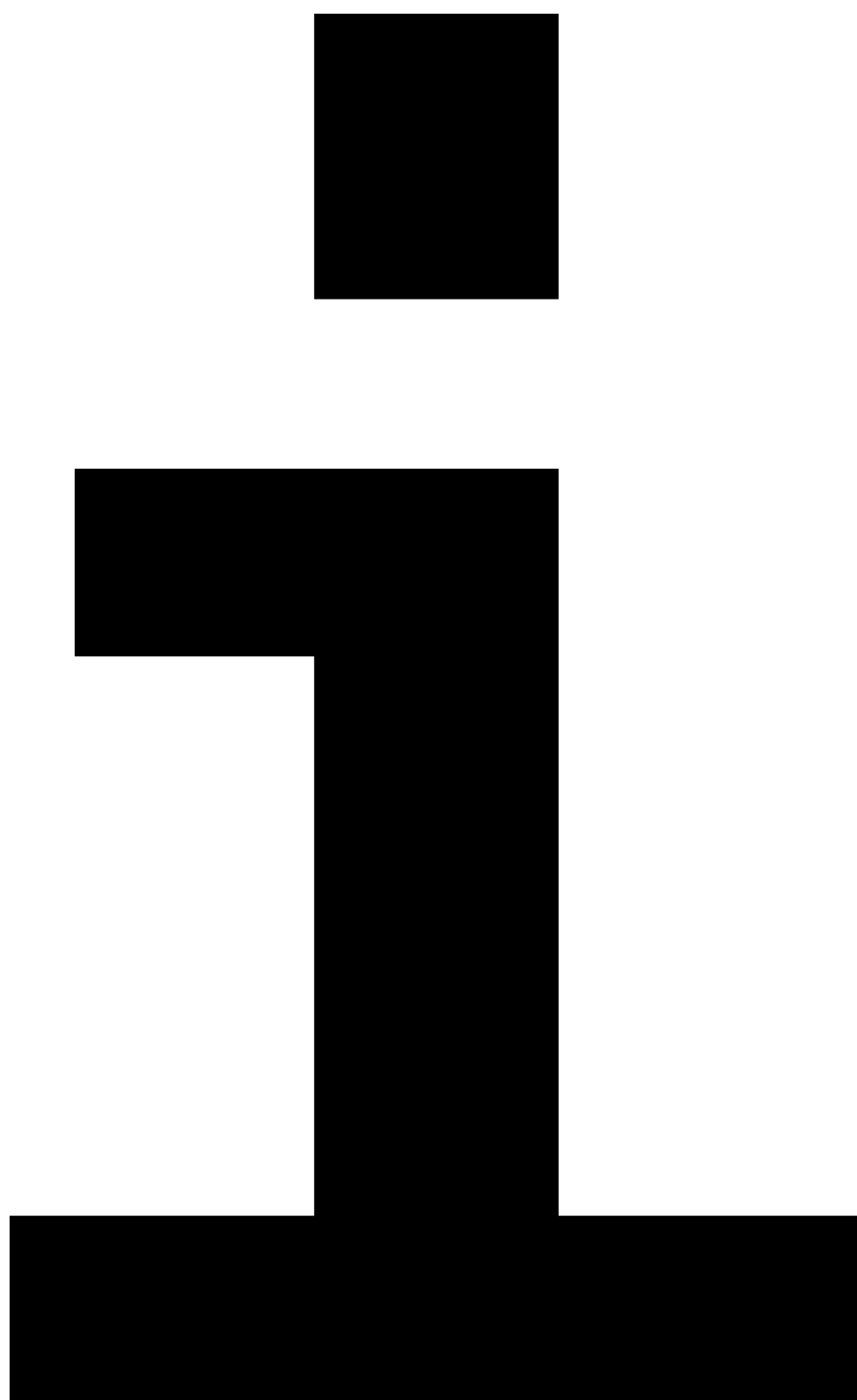
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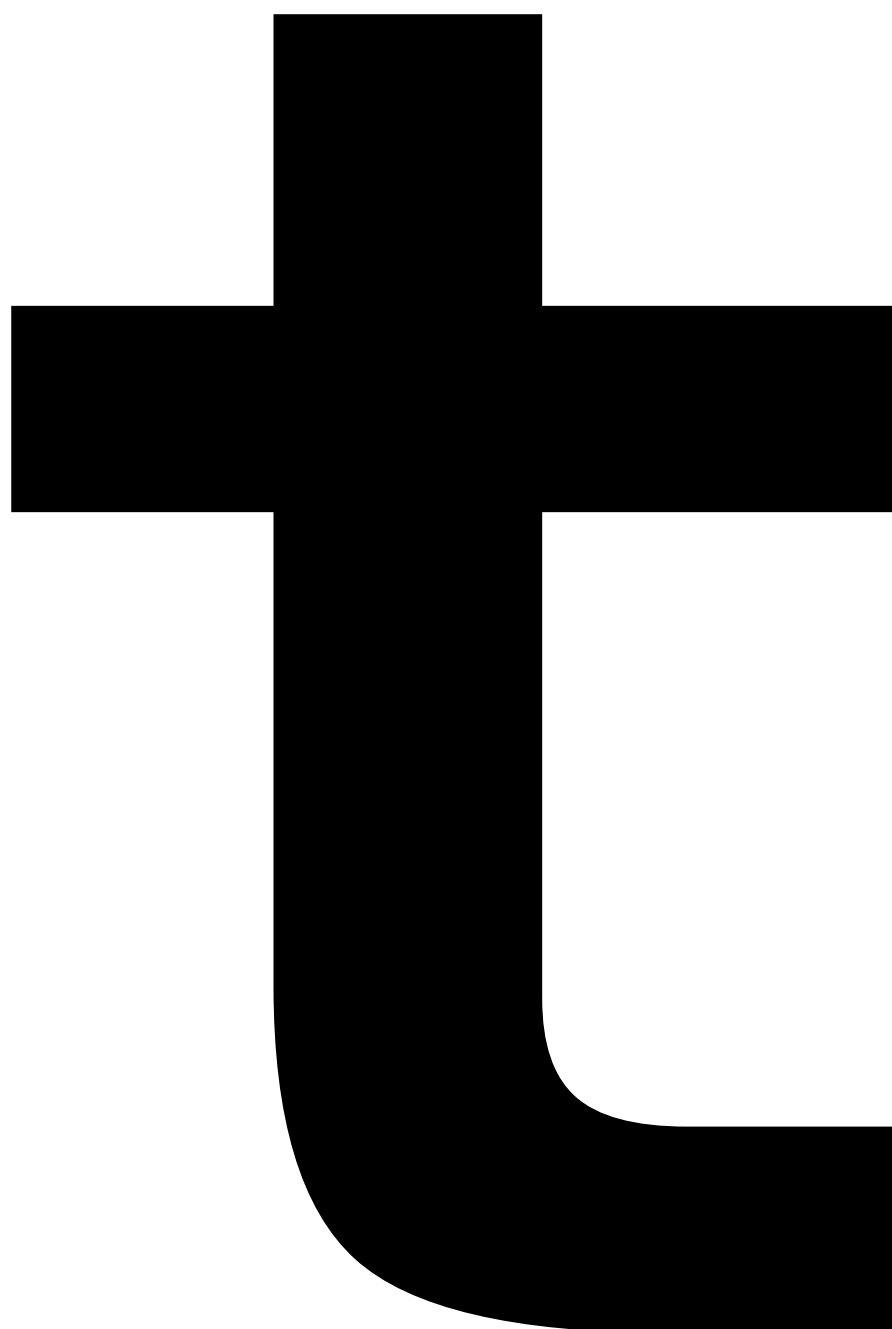
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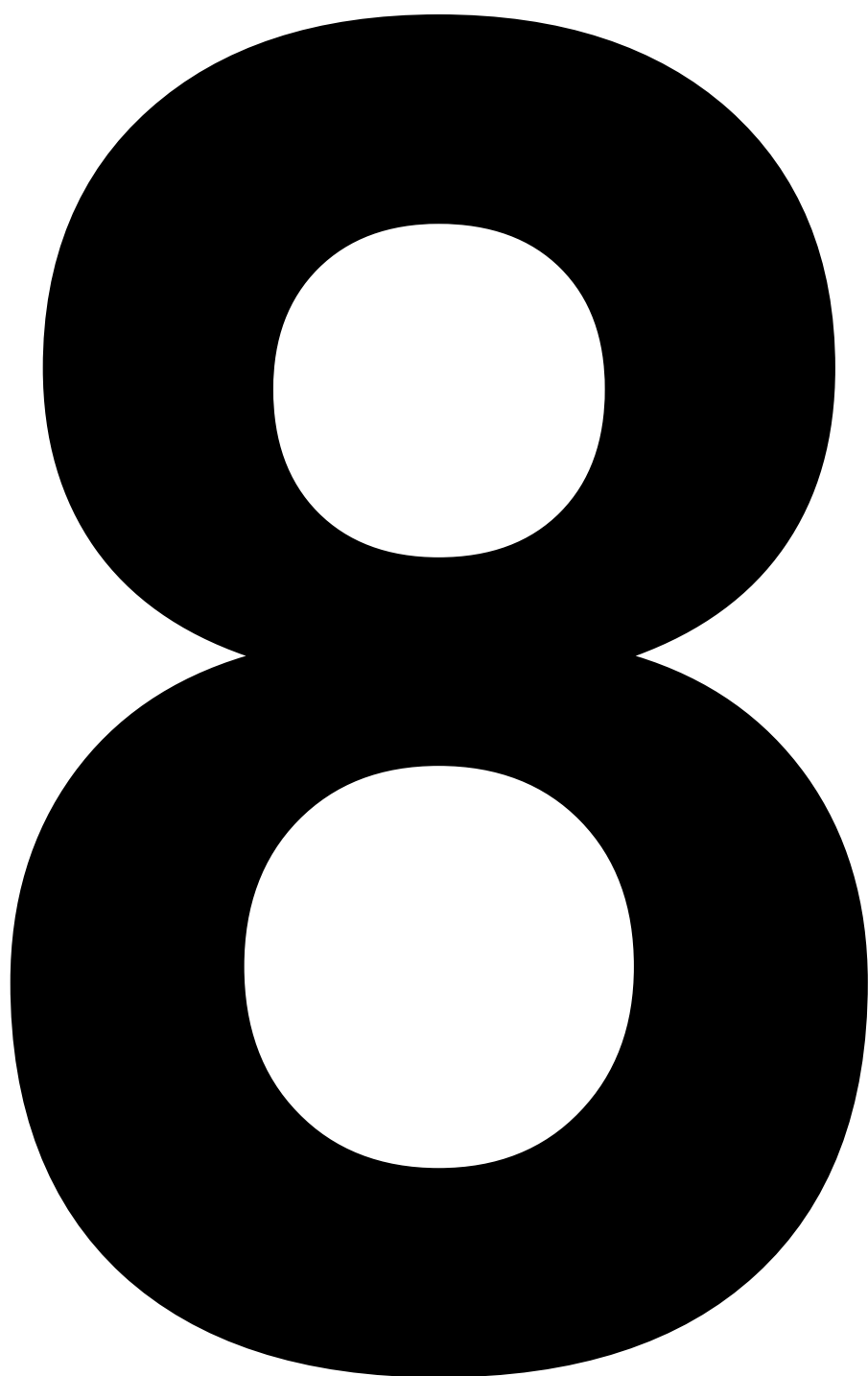
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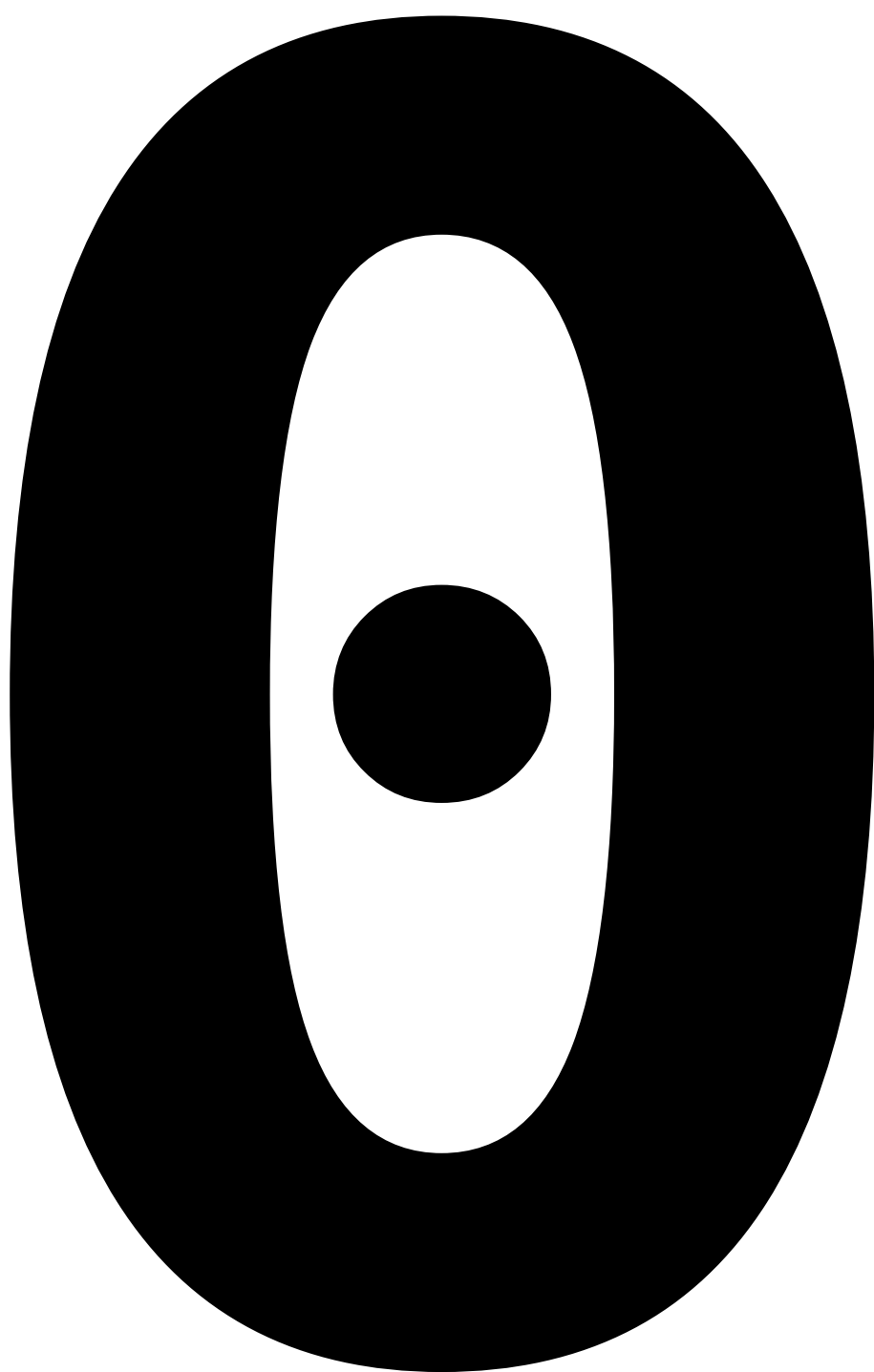
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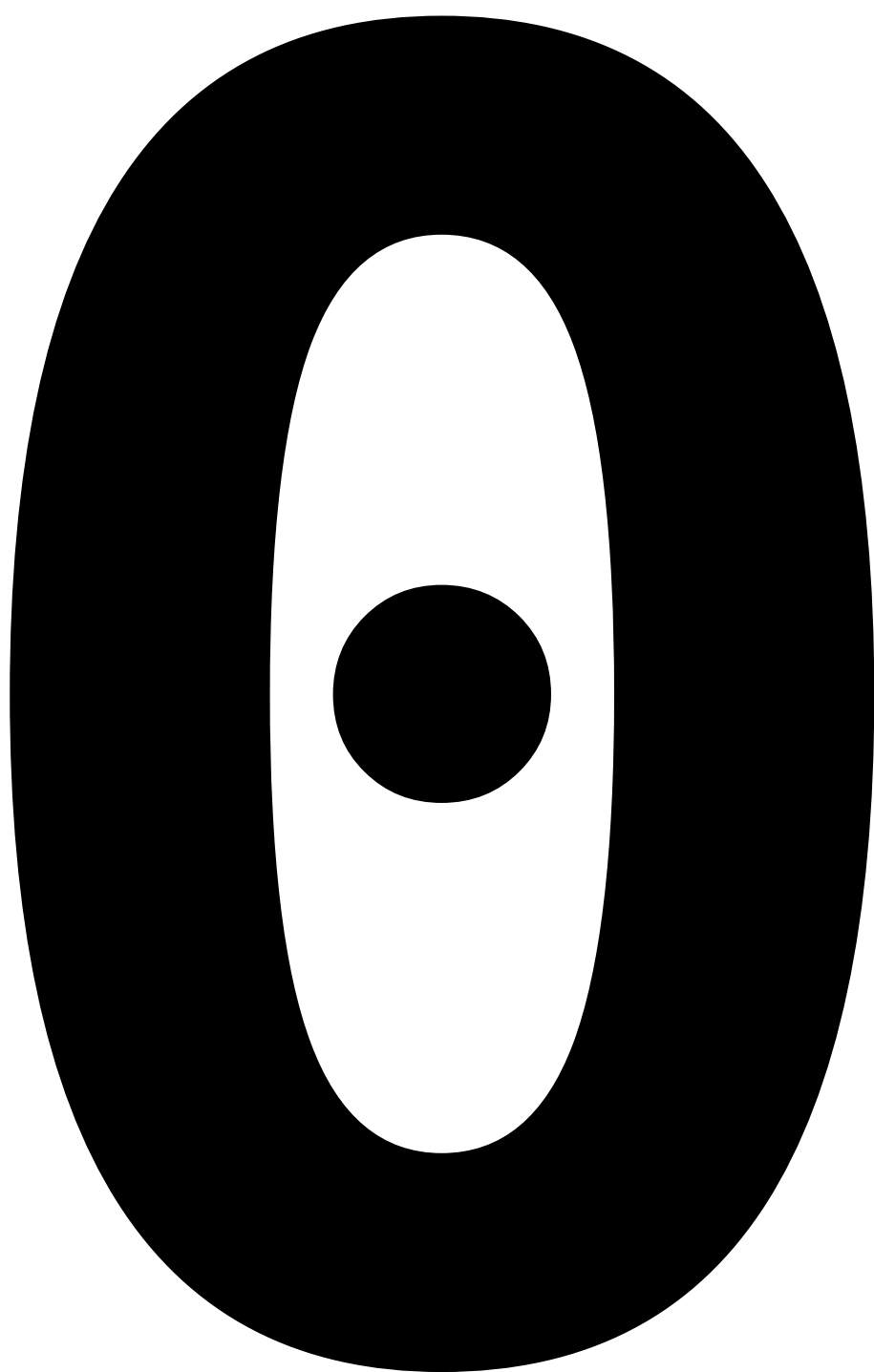
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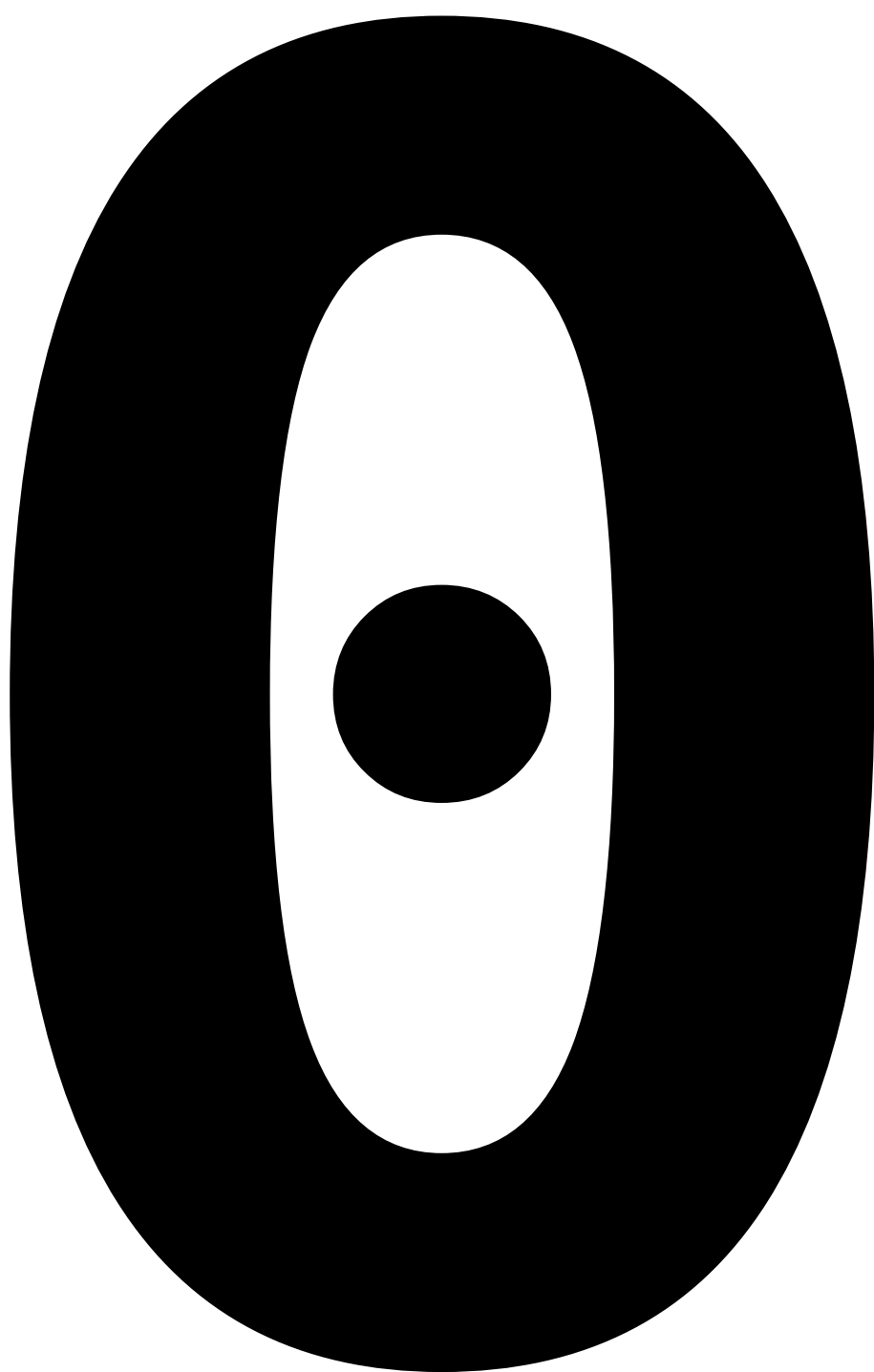
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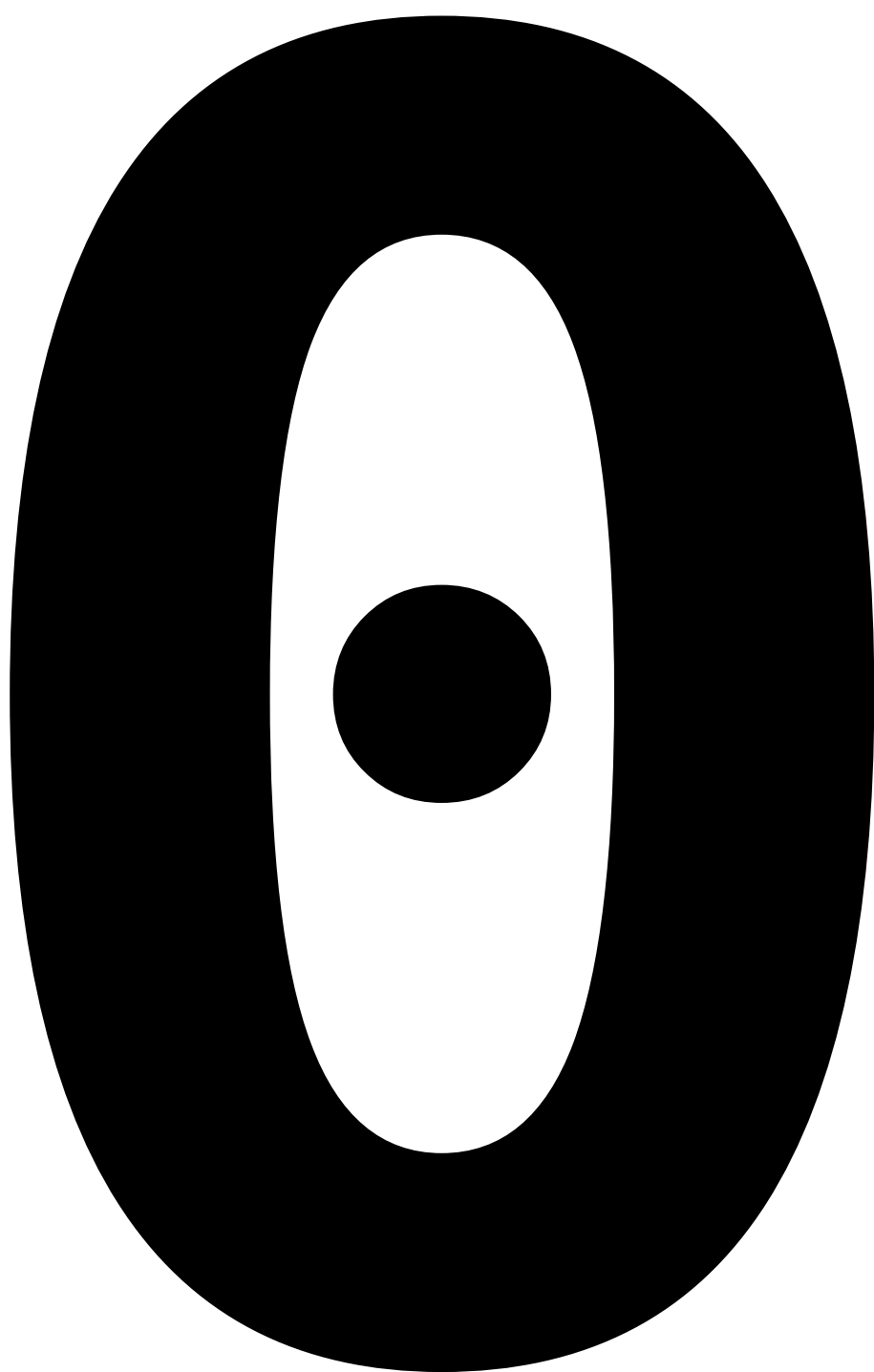
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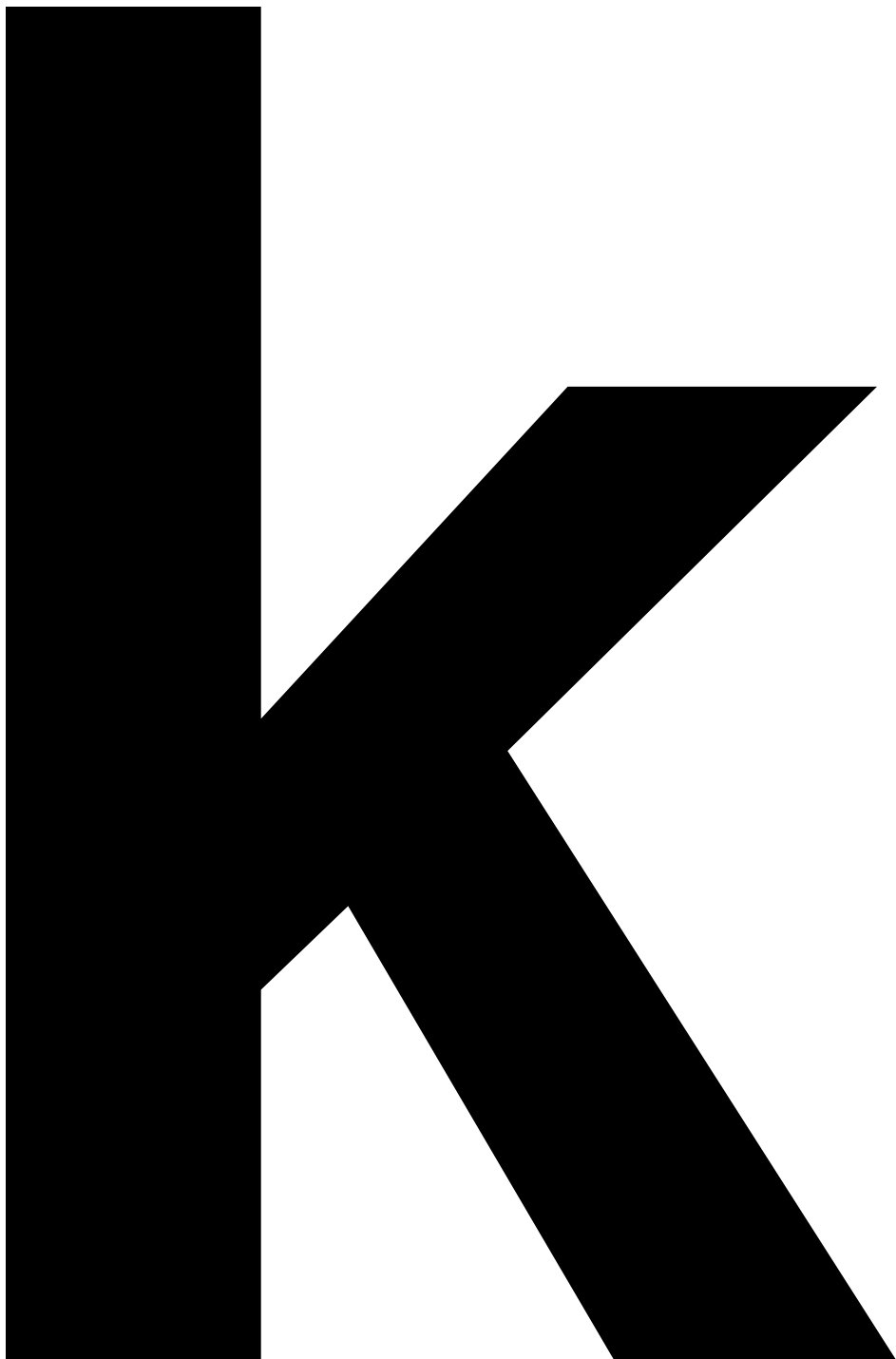
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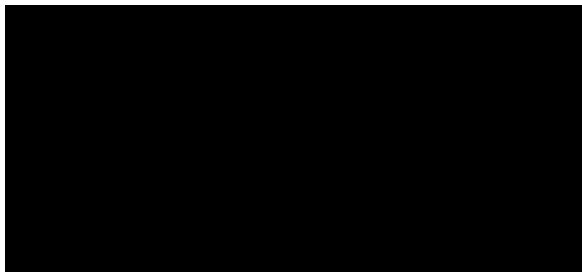
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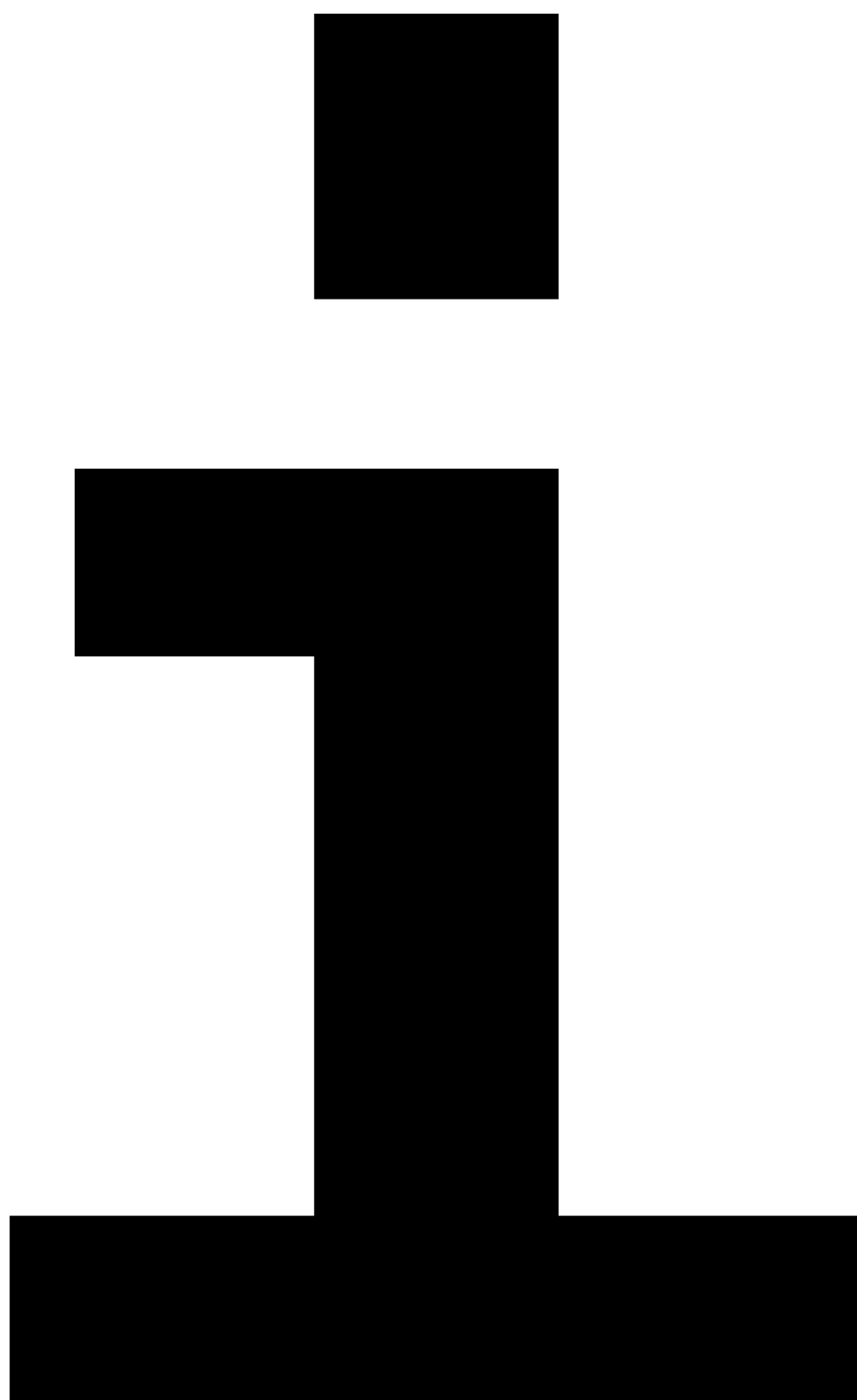
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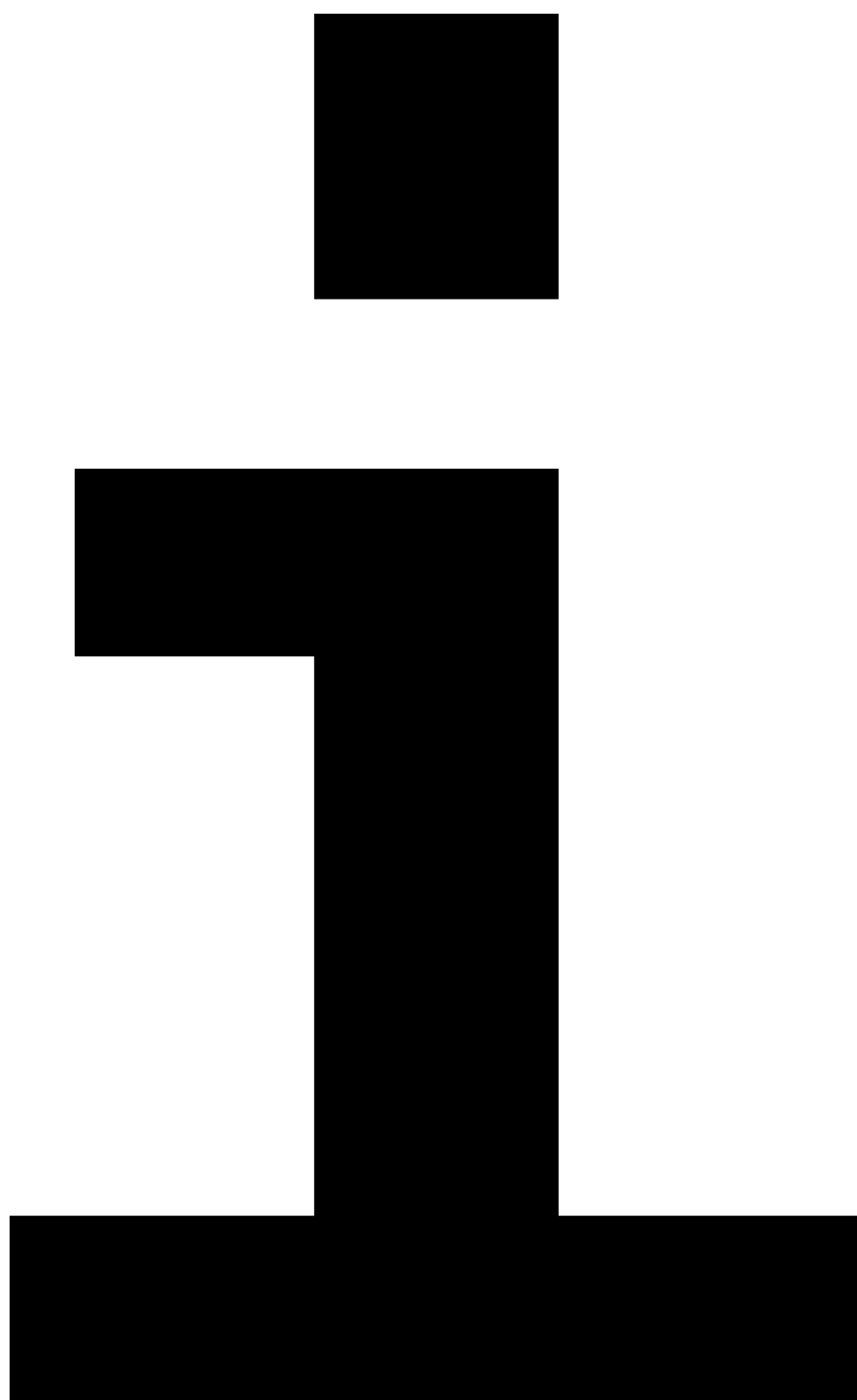
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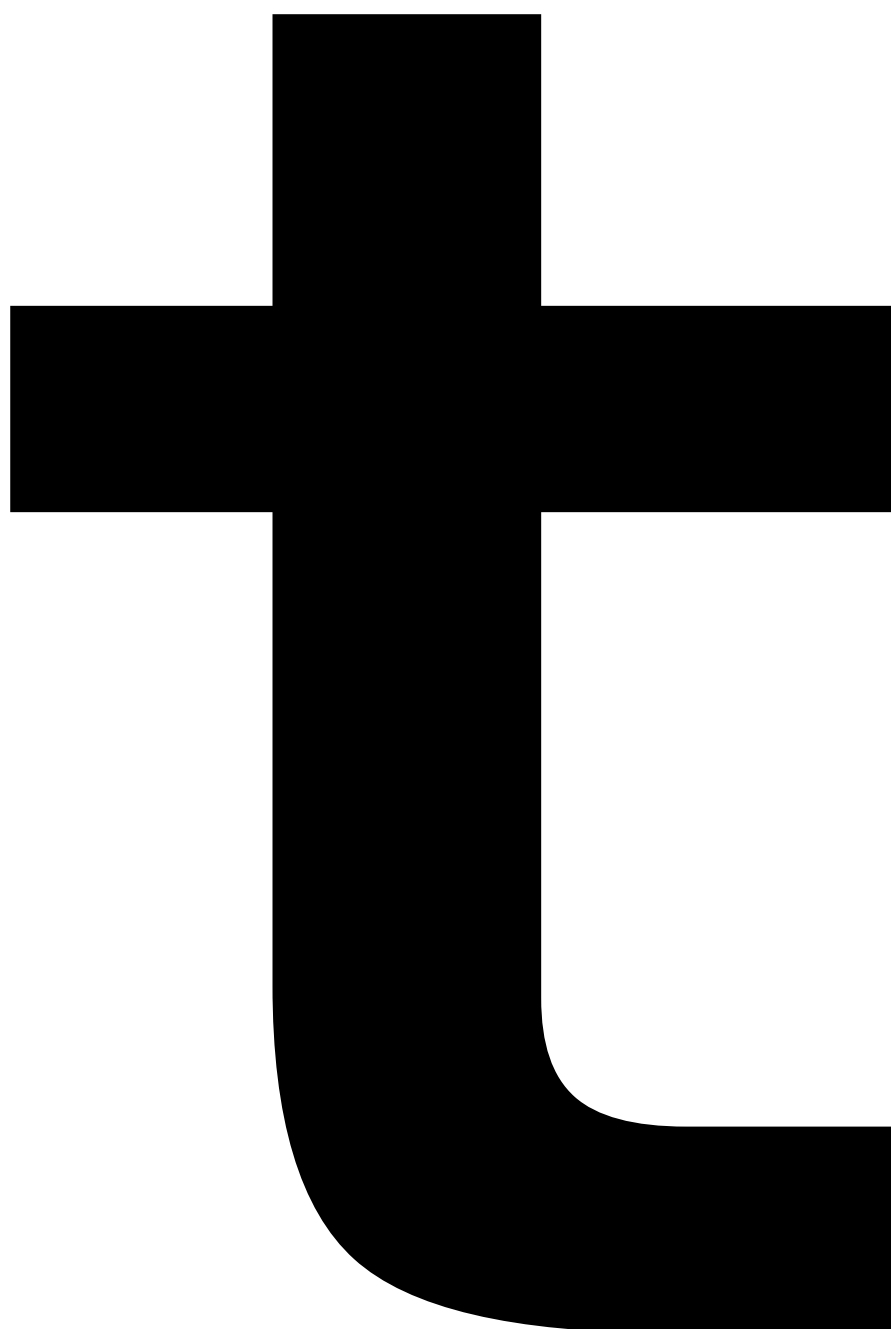


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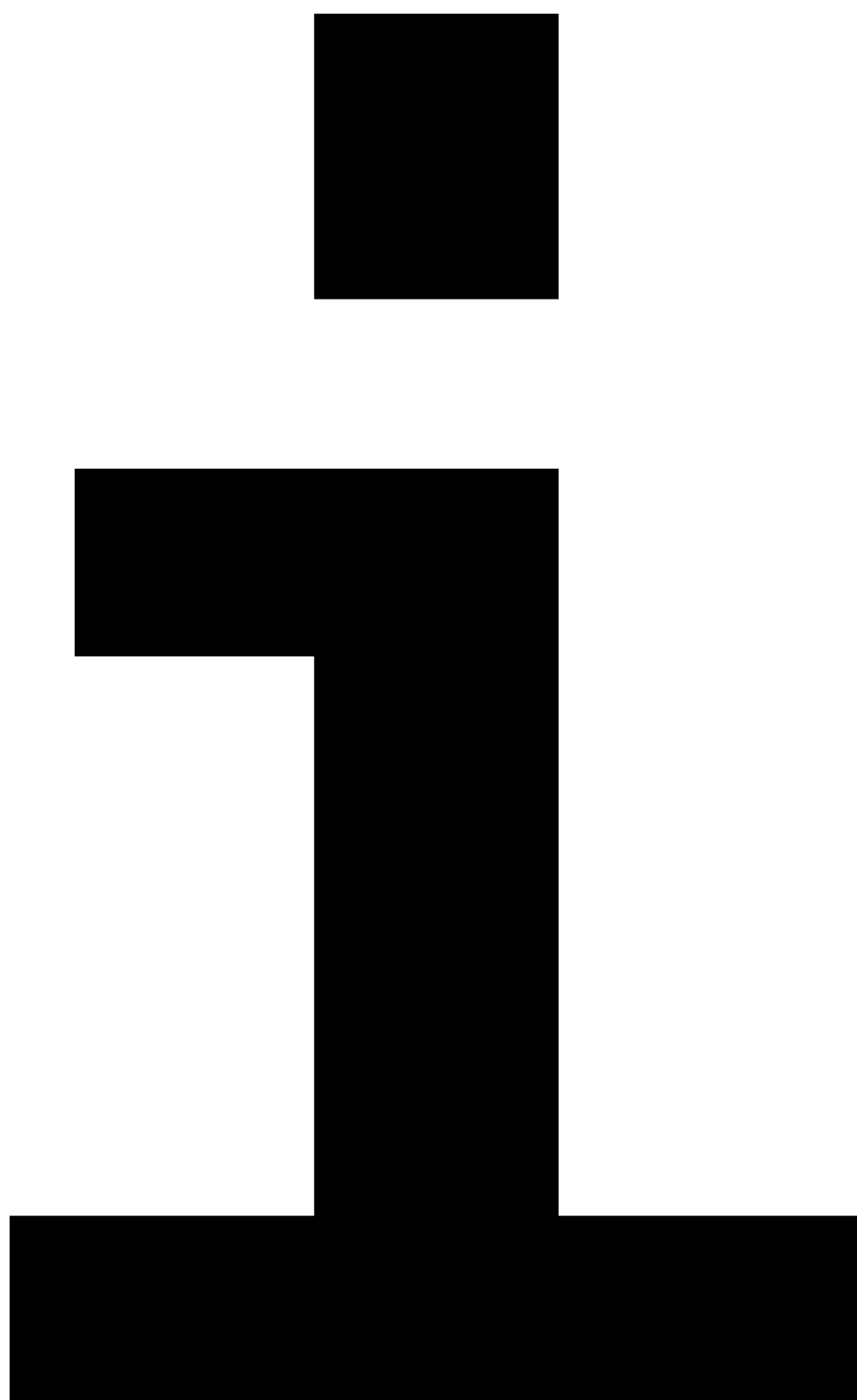
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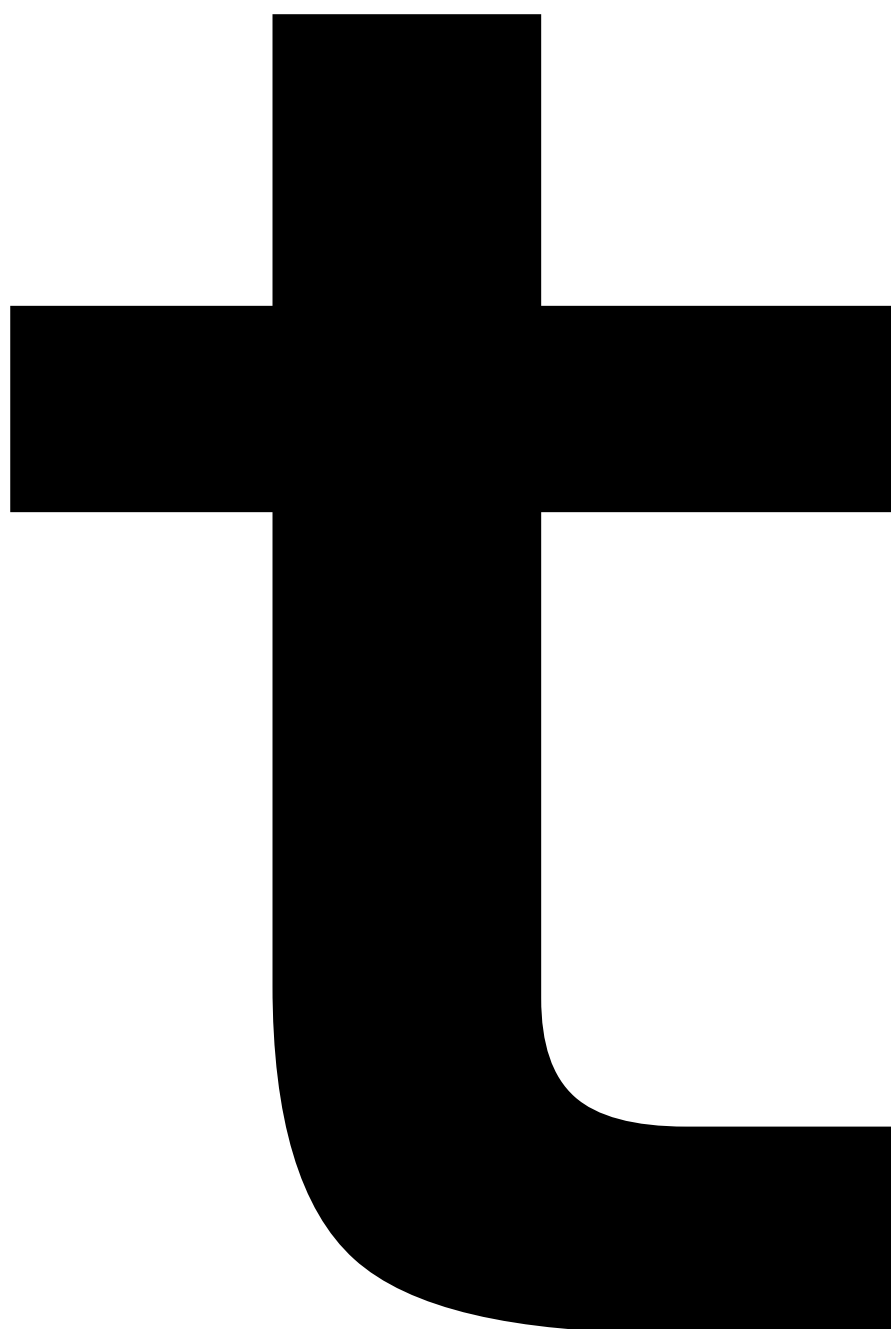




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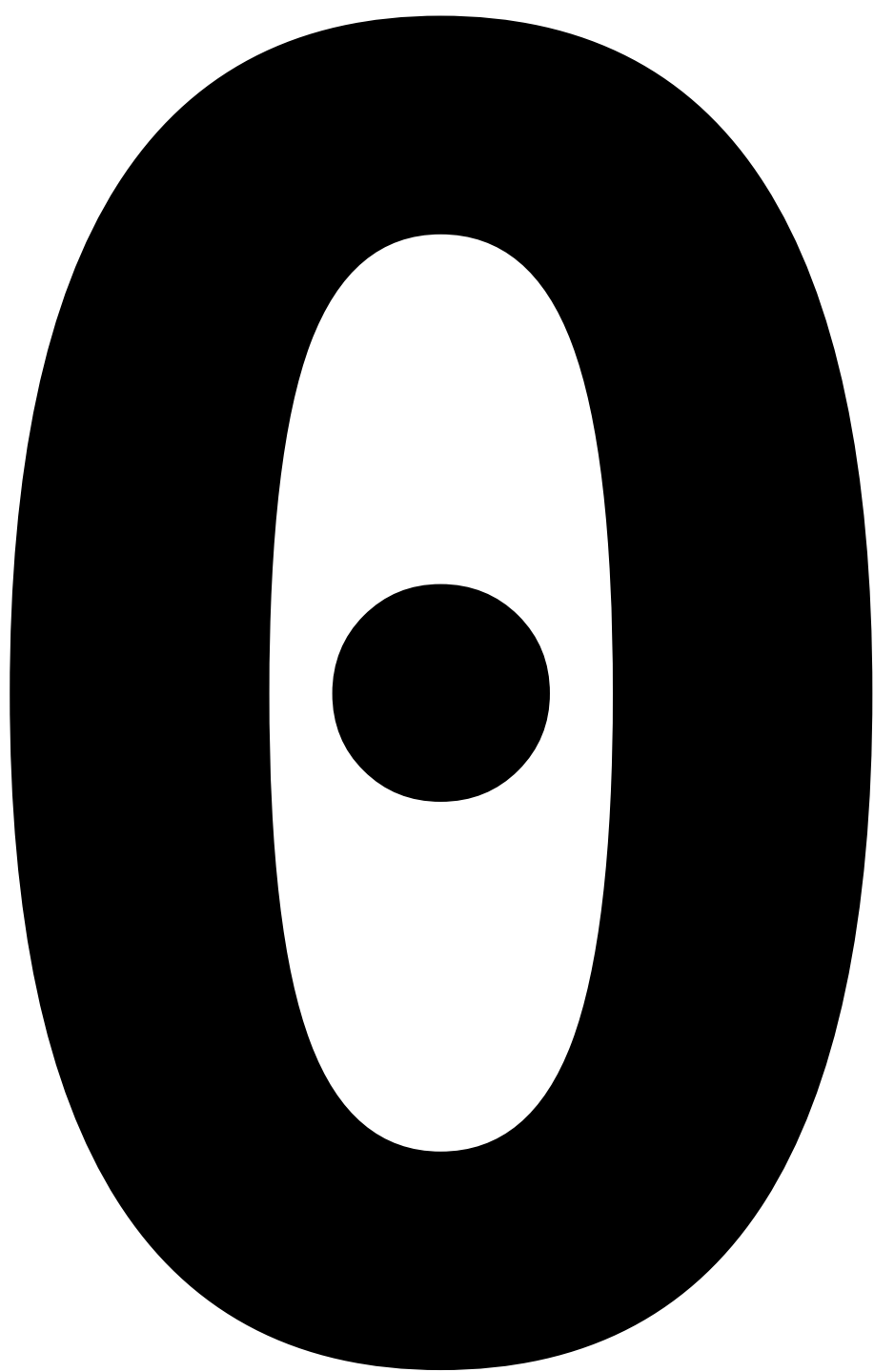
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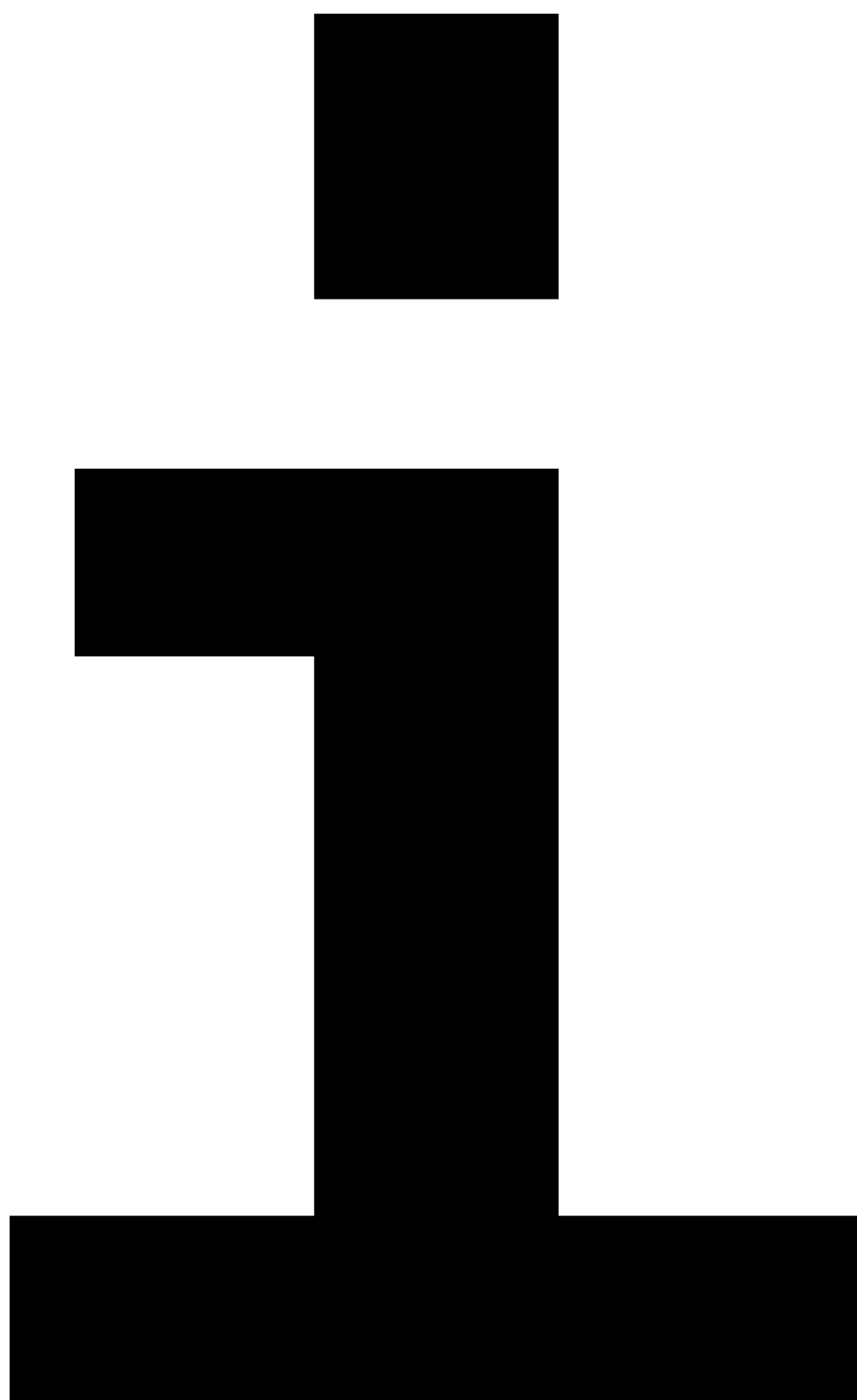
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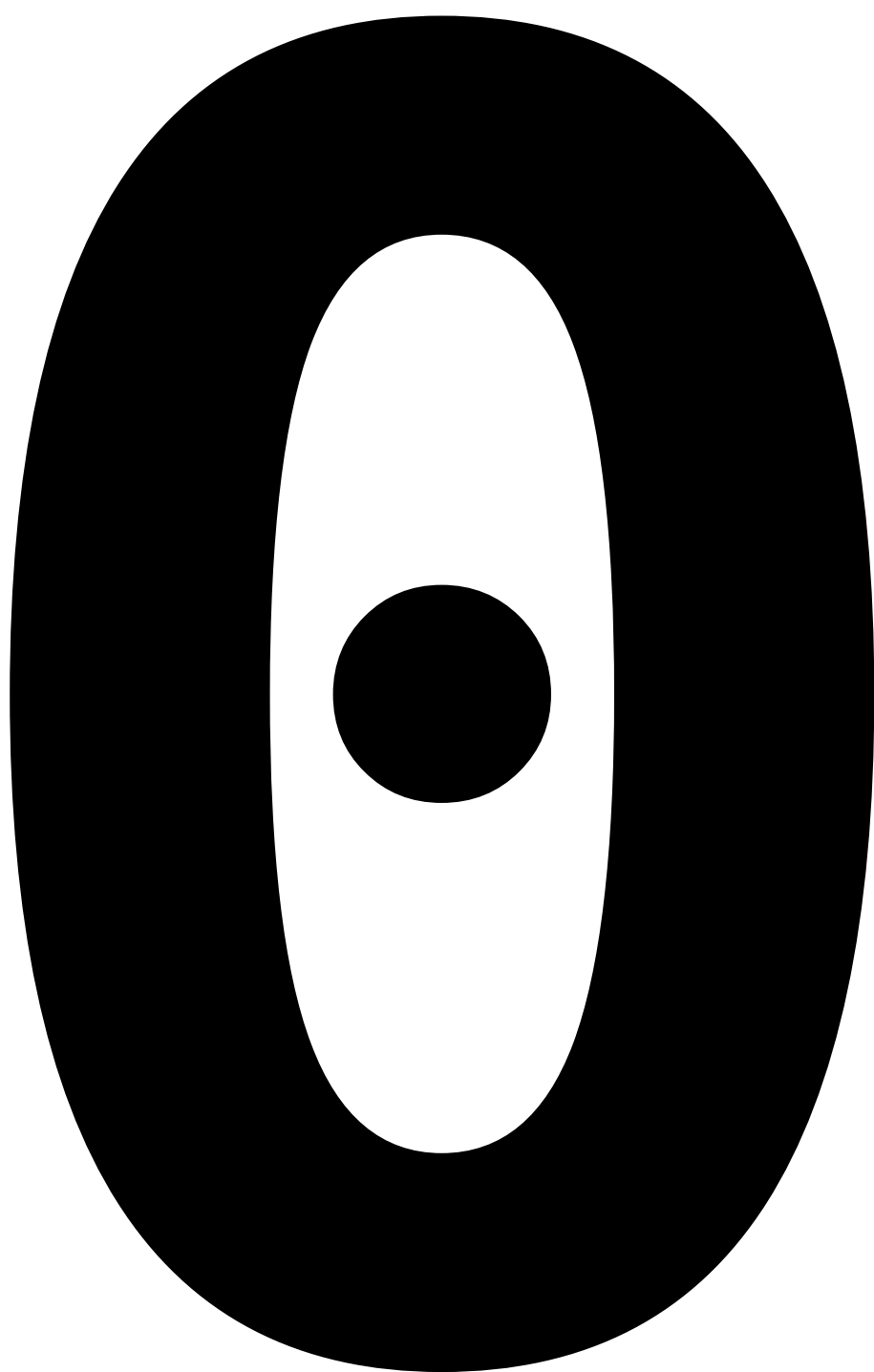


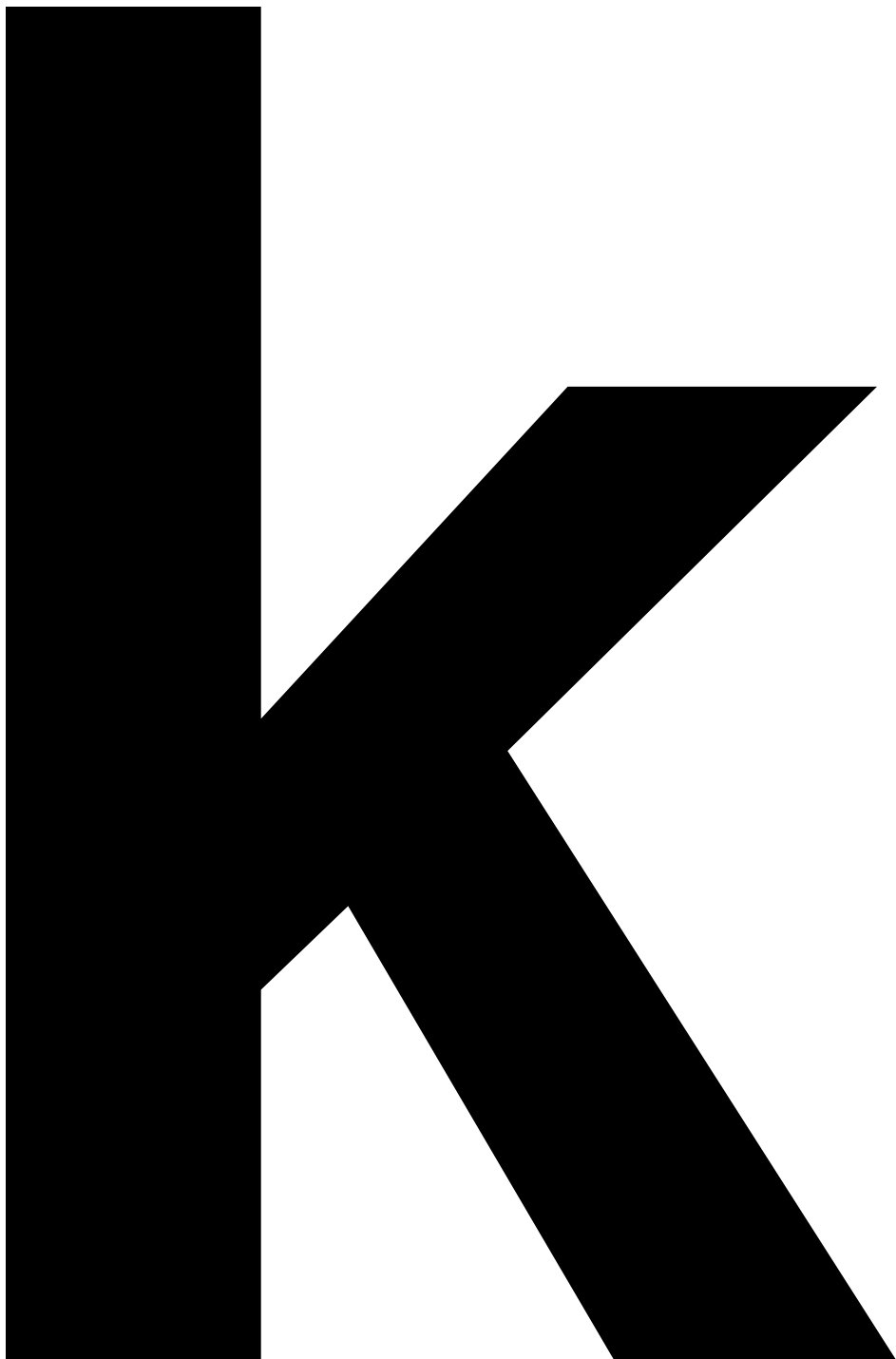
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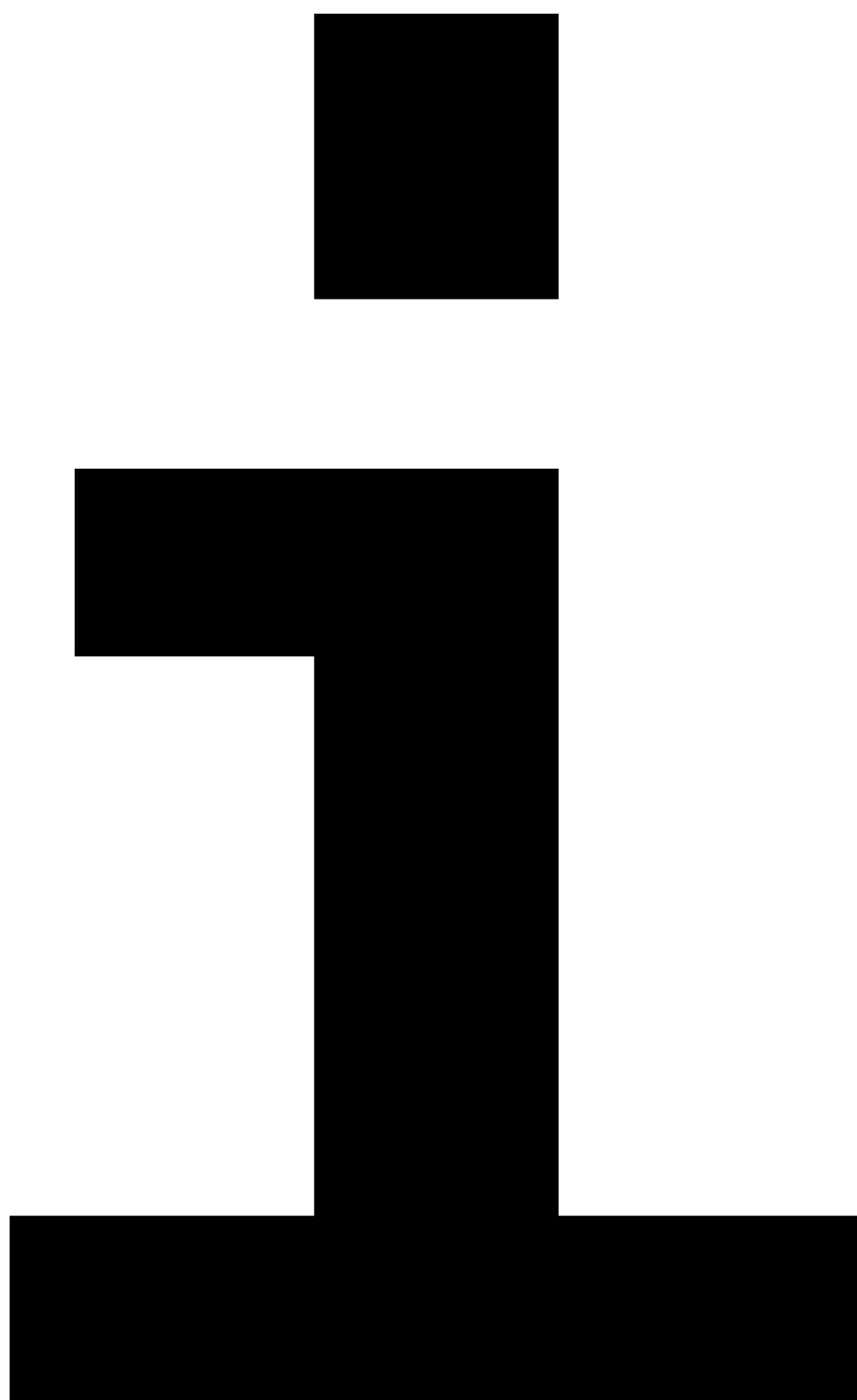


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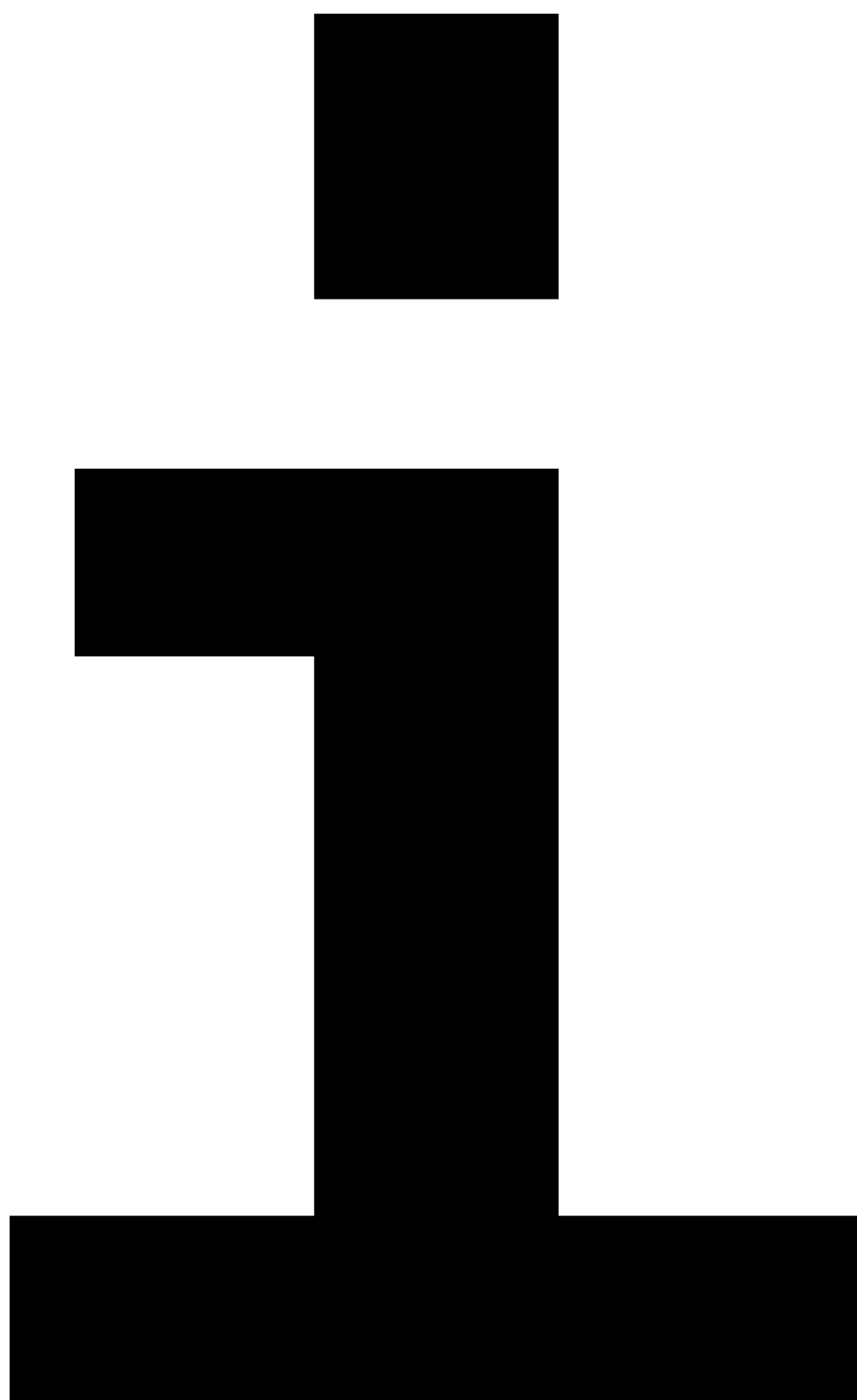
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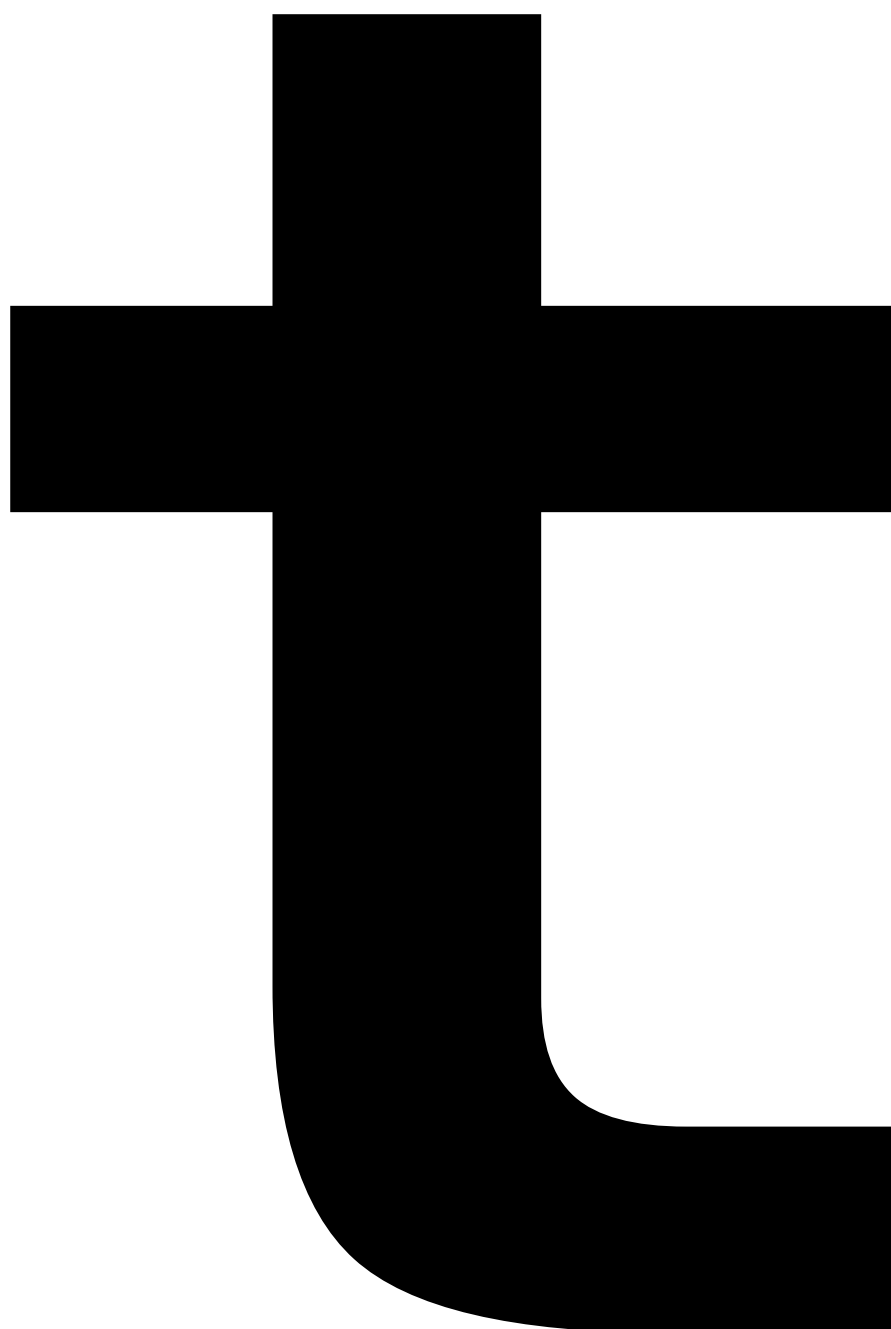
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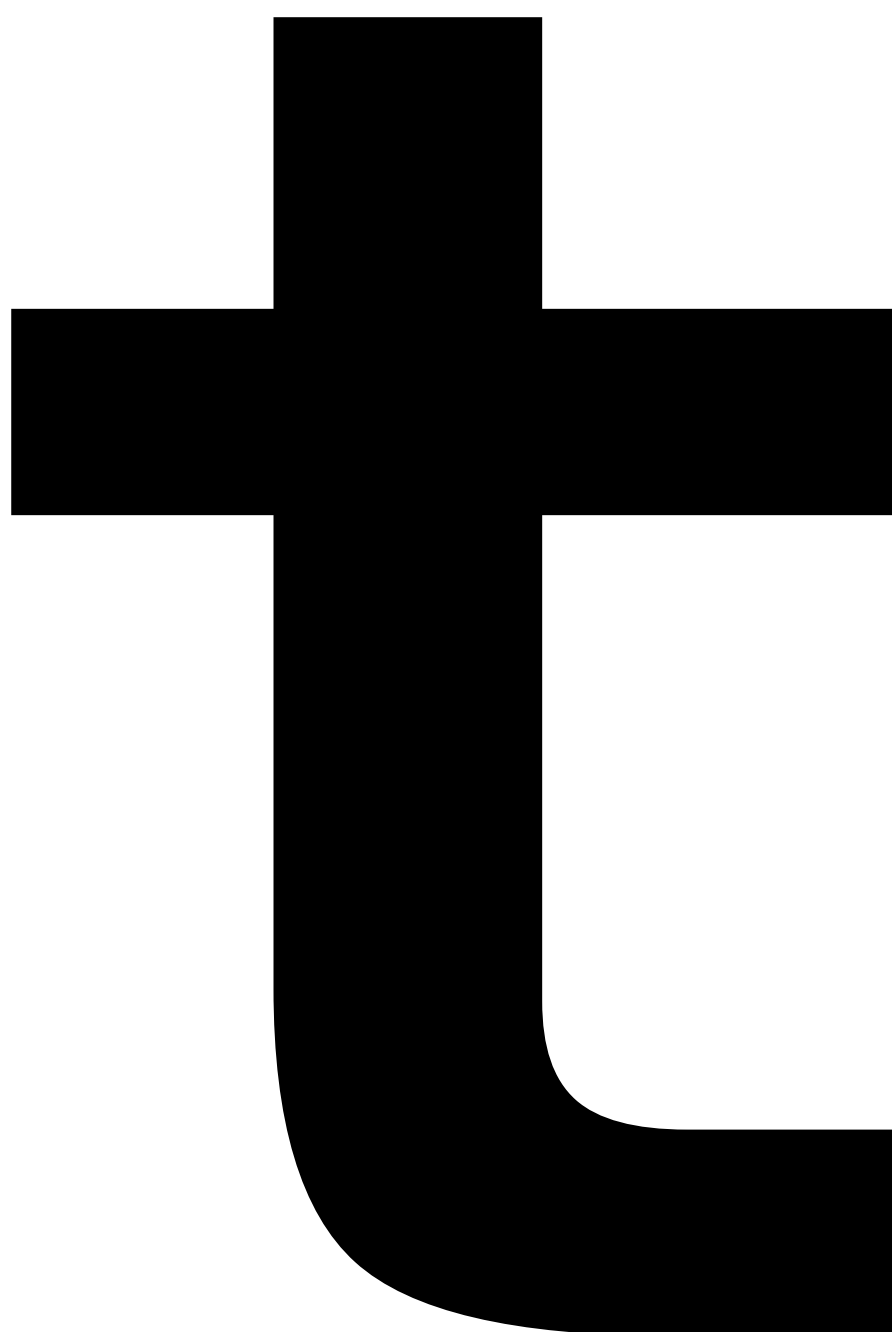
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