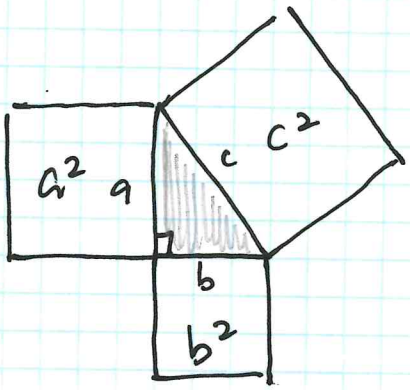
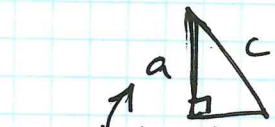
Toolkit #25: Pythagorean Theorem



$a^2 + b^2 = c^2$

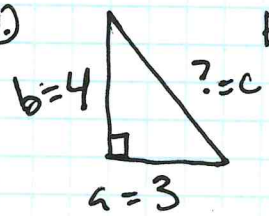
Only works for right triangles!



"hypotenuse" ← longest side

"legs" → shortest sides

Examples:

1. 

Find the missing side.

$a^2 + b^2 = c^2$

$(3)^2 + (4)^2 = c^2$

$9 + 16 = c^2$

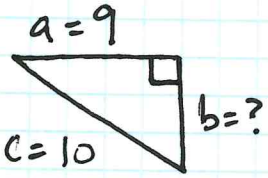
$\sqrt{25} = \sqrt{c^2}$

$5 = c$

$\sqrt{\text{undoes}}^2$

$\sqrt{x^2} = x$

$\sqrt{25} = \sqrt{5^2} = 5$

2. 

Find the missing side.

$a^2 + b^2 = c^2$

$(9)^2 + b^2 = (10)^2$

$81 + b^2 = 100$

$-81 \quad -81$

$\sqrt{b^2} = \sqrt{19}$

$\sqrt{16} \quad \sqrt{19} \quad \sqrt{25}$ (+3, +6)

$4 < \sqrt{19} < 5$ $\quad b \approx 4.3$

Perfect Squares:

$1^2 = 1$	$6^2 = 36$	$11^2 = 121$	$16^2 =$	$21^2 =$
$2^2 = 4$	$7^2 = 49$	$12^2 = 144$	$17^2 =$	$22^2 =$
$3^2 = 9$	$8^2 = 64$	$13^2 = 169$	$18^2 =$	$23^2 =$
$4^2 = 16$	$9^2 = 81$	$14^2 = 196$	$19^2 =$	$24^2 =$
$5^2 = 25$	$10^2 = 100$	$15^2 = 225$	$20^2 = 400$	$25^2 =$