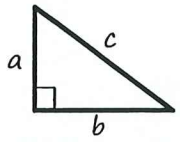
Pythagorean Theorem

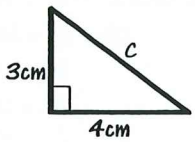
Name: KEY

Consider any right triangle where the short sides have lengths a and b and the hypotenuse has length c.

Then the Pythagorean theorem is $a^2 + b^2 = c^2$:



Example



Using the theorem, you have $3^2 + 4^2 = c^2$

$9 + 16 = c^2$

$25 = c^2$

$\sqrt{25} = c$

$5 = c$

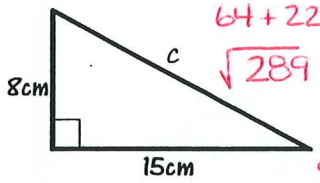
Using the Pythagorean theorem, calculate the value of c and draw an arrow to the matching answer in the middle of the worksheet.

$8^2 + 15^2 = c^2$

$64 + 225 = c^2$

$\sqrt{289} = \sqrt{c^2}$

$17 = c$ cm

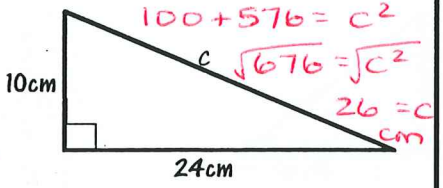


$10^2 + 24^2 = c^2$

$100 + 576 = c^2$

$\sqrt{676} = \sqrt{c^2}$

$26 = c$ cm

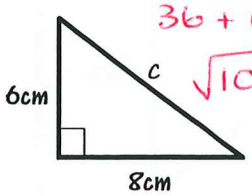


$6^2 + 8^2 = c^2$

$36 + 64 = c^2$

$\sqrt{100} = \sqrt{c^2}$

$10 = c$ cm

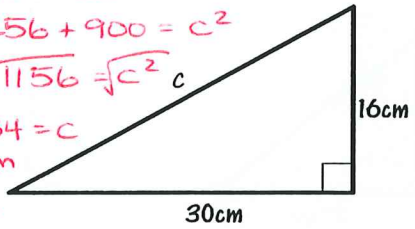


$16^2 + 30^2 = c^2$

$256 + 900 = c^2$

$\sqrt{1156} = \sqrt{c^2}$

$34 = c$ cm

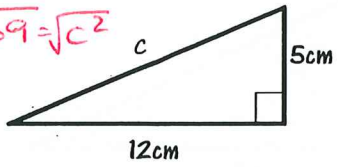


$5^2 + 12^2 = c^2$

$25 + 144 = c^2$

$\sqrt{169} = \sqrt{c^2}$

$c = 13$cm

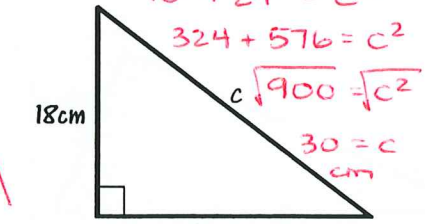


$18^2 + 24^2 = c^2$

$324 + 576 = c^2$

$\sqrt{900} = \sqrt{c^2}$

$30 = c$ cm

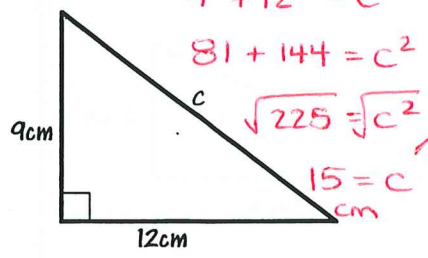


$9^2 + 12^2 = c^2$

$81 + 144 = c^2$

$\sqrt{225} = \sqrt{c^2}$

$15 = c$ cm

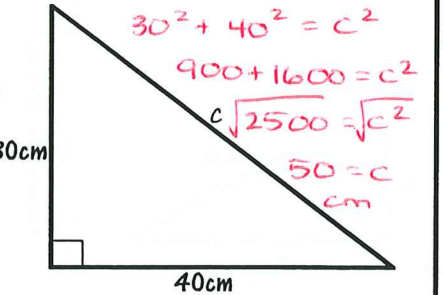


$30^2 + 40^2 = c^2$

$900 + 1600 = c^2$

$\sqrt{2500} = \sqrt{c^2}$

$50 = c$ cm

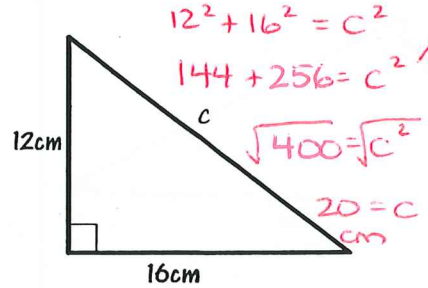


$12^2 + 16^2 = c^2$

$144 + 256 = c^2$

$\sqrt{400} = \sqrt{c^2}$

$20 = c$ cm

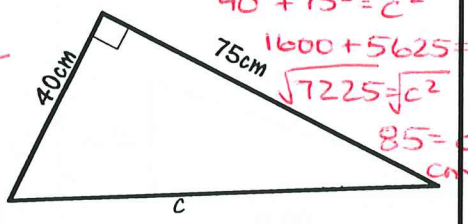


$40^2 + 75^2 = c^2$

$1600 + 5625 = c^2$

$\sqrt{7225} = \sqrt{c^2}$

$85 = c$ cm



34cm

30cm

50cm

17cm

26cm

10cm

15cm

20cm

13cm

85cm

Pythagorean Theorem

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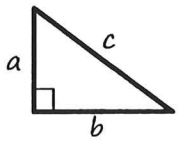
Then the Pythagorean theorem is $a^2 + b^2 = c^2$:



Example

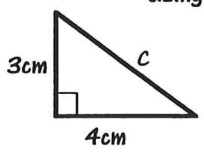
Using the theorem, you have $3^2 + 4^2 = c^2$

$9 + 16 = c^2$

$25 = c^2$

$\sqrt{25} = c$

$5 = c$



Example

Using the theorem, you have $5^2 + b^2 = 13^2$

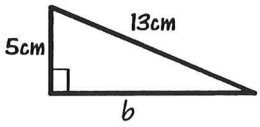
$25 + b^2 = 169$

$b^2 = 169 - 25$

$b^2 = 144$

$b = \sqrt{144}$

$b = 12$



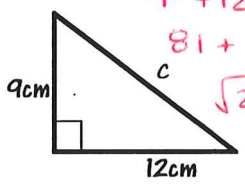
Using the Pythagorean theorem, calculate the value of the missing length. Draw an arrow to the matching answer in the middle.

$9^2 + 12^2 = c^2$

$81 + 144 = c^2$

$\sqrt{225} = \sqrt{c^2}$

$15 = c$ cm

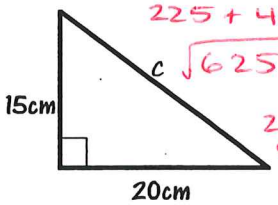


$15^2 + 20^2 = c^2$

$225 + 400 = c^2$

$\sqrt{625} = \sqrt{c^2}$

$25 = c$ cm

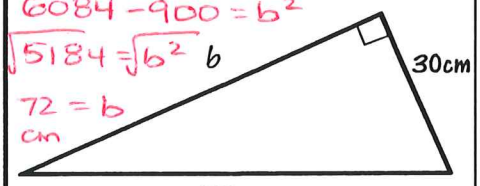


$78^2 - 30^2 = b^2$

$6084 - 900 = b^2$

$\sqrt{5184} = \sqrt{b^2}$

$72 = b$ cm

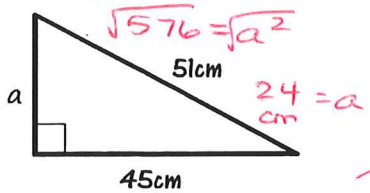


$51^2 - 45^2 = a^2$

$2601 - 2025 = a^2$

$\sqrt{576} = \sqrt{a^2}$

$24 = a$ cm

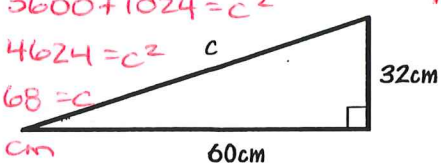


$60^2 + 32^2 = c^2$

$3600 + 1024 = c^2$

$4624 = c^2$

$68 = c$ cm



16cm

65cm

52cm

15cm

25cm

68cm

45cm

24cm

72cm

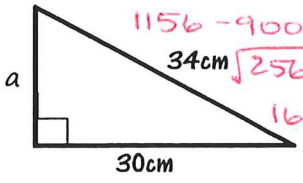
40cm

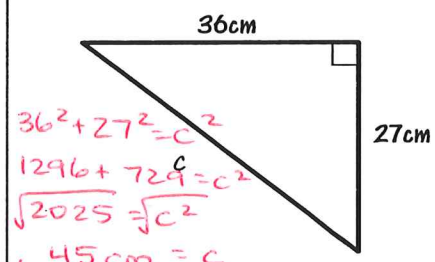
$34^2 - 30^2 = a^2$

$1156 - 900 = a^2$

$\sqrt{256} = \sqrt{a^2}$

$16 = a$ cm





$36^2 + 27^2 = c^2$

$1296 + 729 = c^2$

$\sqrt{2025} = \sqrt{c^2}$

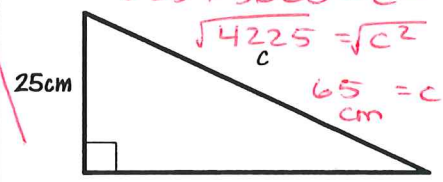
$45\text{ cm} = c$

$25^2 + 60^2 = c^2$

$625 + 3600 = c^2$

$\sqrt{4225} = \sqrt{c^2}$

$65 = c$ cm

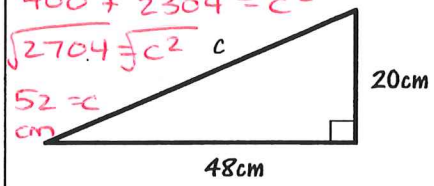


$20^2 + 48^2 = c^2$

$400 + 2304 = c^2$

$\sqrt{2704} = \sqrt{c^2}$

$52 = c$ cm



$85^2 - 75^2 = a^2$

$7225 - 5625 = a^2$

$\sqrt{1600} = \sqrt{a^2}$

$40 = a$ cm