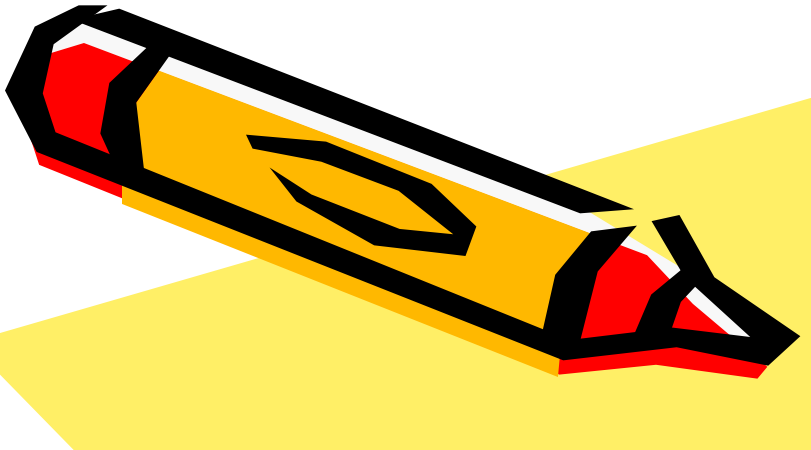
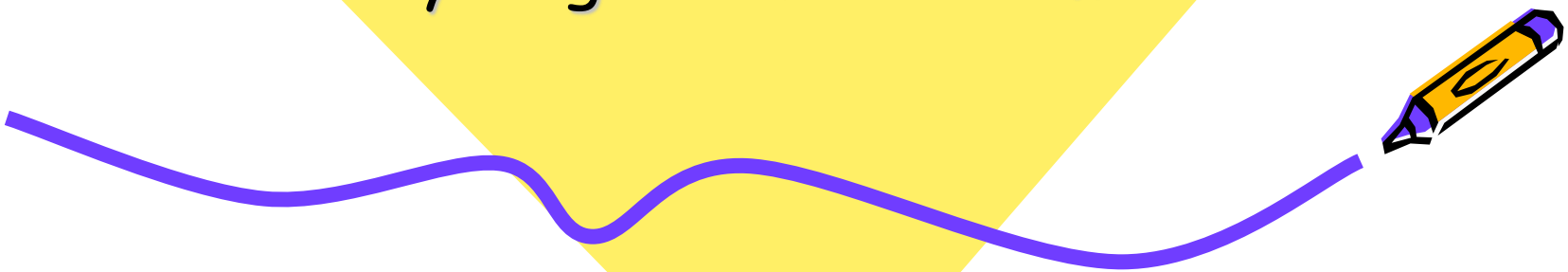


Geometry

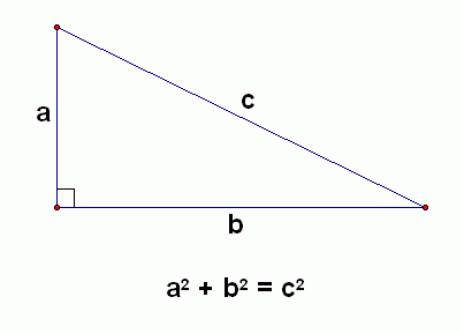
Pythagorean Theorem



Pythagorean Theorem

Pythagorean Theorem is used for right triangles.

In any right triangle, the sum of the squares of the measures of the legs is equal to the hypotenuse squared.

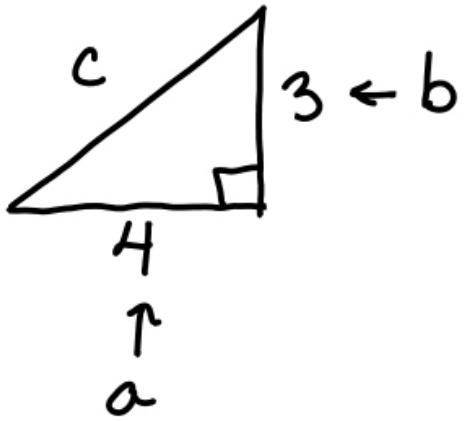


$$a^2 + b^2 = c^2$$

a and b represent the legs. c represents the hypotenuse (the longest side).

Pythagorean Theorem

Find the length of the missing legs



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

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

$16 + 9 = c^2$

$25 = c^2$

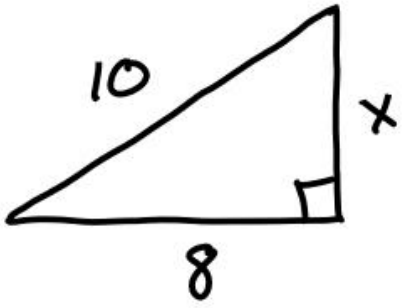
Find c by taking square root of both sides

$c^2 = 25$

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

$c = 5$ ← answer

Pythagorean Theorem



$c = 10$
$a = 8$
$b = x$

plug-in

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

$8^2 + x^2 = 10^2$

$64 + x^2 = 100$

$-64 \qquad -64$ ← get x^2 isolated

$x^2 = 36$

$\sqrt{x^2} = \sqrt{36}$

$x = 6$ ← answer

Pythagorean Theorem

3 whole numbers that satisfy the Pythagorean Theorem are called a Pythagorean Triple. For example: 3,4,5 or 5,12,13 or 14,48,50.

A Pythagorean Triple where the GCF of the numbers is 1, is called the root (or base) of the Pythagorean Family. Multiples of the root are Pythagorean Triples that belong the that family.

family name and root triple

examples of triples that belong to the family

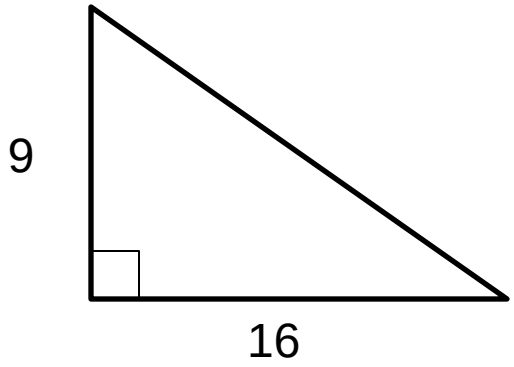
<u>3,4,5</u>
6,8,10
9,12,15
30,40,50

<u>5,12,13</u>
10,24,26
15,36,39
50,120,130

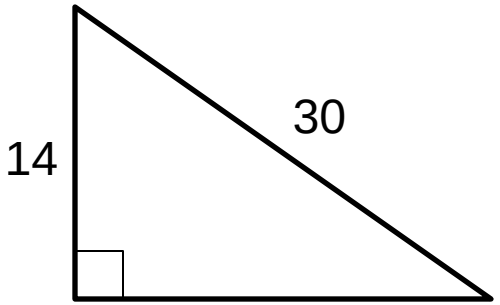
Pythagorean Theorem

Find the missing side of each right triangle.
Round to the nearest tenth.

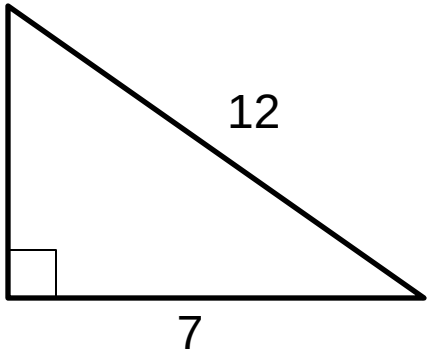
a)



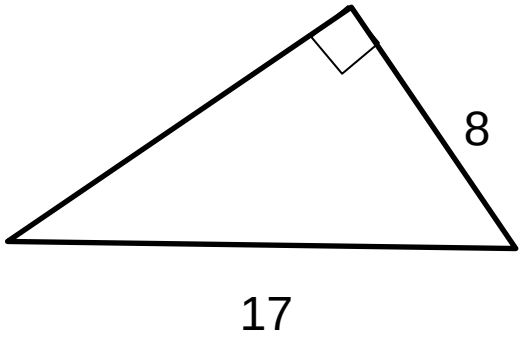
b)



c)



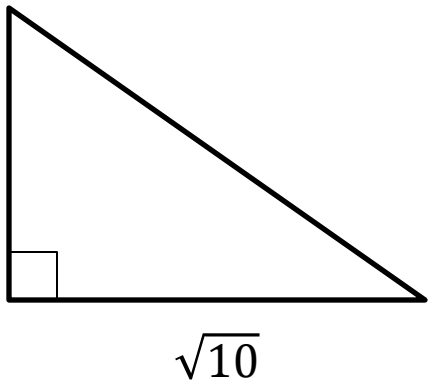
d)



Pythagorean Theorem

Find the missing side of each right triangle.
Leave all answers in simplest radical form.

a)



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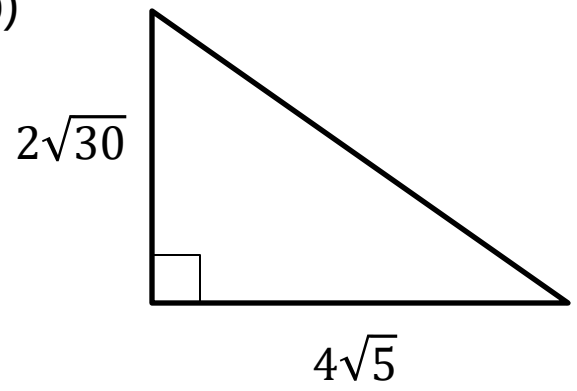
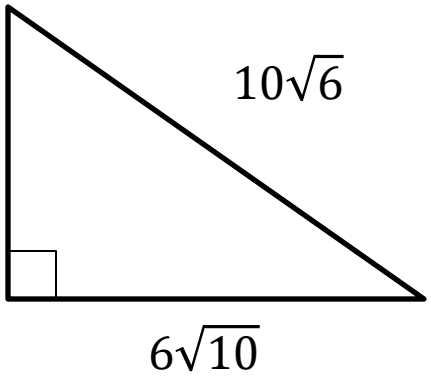


c)



d)