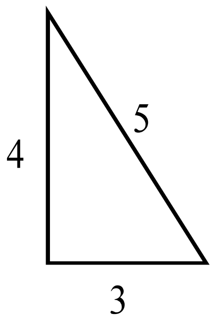
Pythagorean Theorem 1 **(KEY)**

Geometry

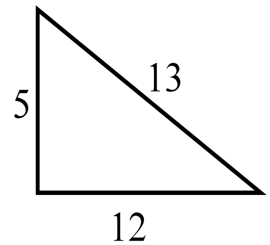
Use the Pythagorean Theorem to find the missing lengths in these right triangles. Put answers in simplest radical form and to the nearest tenth, if the answer isn't a whole number.

1)



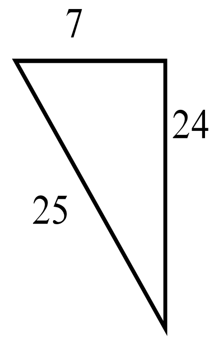
$3^2 + 4^2 = c^2$
$9 + 16 = c^2$
$\sqrt{25} = \sqrt{c^2}$

2)



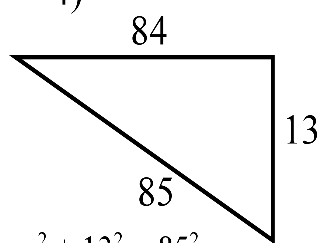
$a^2 + 12^2 = 13^2$
$a^2 + 144 = 169$
$-144 \quad -144$
$a^2 = 25$
$\sqrt{a^2} = \sqrt{25}$

3)



$7^2 + 24^2 = c^2$
$49 + 576 = c^2$
$\sqrt{625} = \sqrt{c^2}$

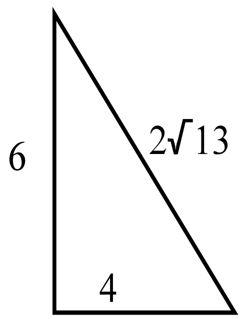
4)



$a^2 + 13^2 = 85^2$
$a^2 + 169 = 7225$
$-169 \quad -169$
$a^2 = 7056$
$\sqrt{a^2} = \sqrt{7056}$

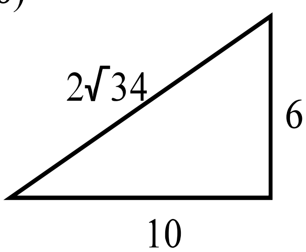
5 = c | **a = 5** | **25 = c** | **a = 84**

5)



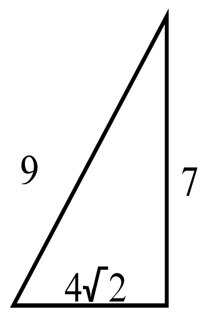
$4^2 + 6^2 = c^2$
$16 + 36 = c^2$
$\sqrt{52} = \sqrt{c^2}$
$\sqrt{4 \cdot 13} = c$

6)



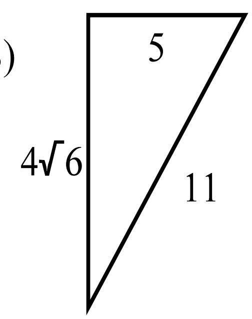
$6^2 + 10^2 = c^2$
$36 + 100 = c^2$
$136 = c^2$
$\sqrt{136} = \sqrt{c^2}$
$\sqrt{4 \cdot 34} = c$

7)



$a^2 + 7^2 = 9^2$
$a^2 + 49 = 81$
$-49 \quad -49$
$a^2 = 32$
$\sqrt{a^2} = \sqrt{32}$
$\sqrt{a^2} = \sqrt{16 \cdot 2}$

8)



$a^2 + 5^2 = 11^2$
$a^2 + 25 = 121$
$-25 \quad -25$
$a^2 = 96$
$\sqrt{a^2} = \sqrt{96}$
$\sqrt{a^2} = \sqrt{16 \cdot 6}$

$2\sqrt{13}$ = c = 7.2 | **$2\sqrt{34}$ = c** = 11.7 | **a = $4\sqrt{2}$** = 5.7 | **a = $4\sqrt{6}$ = 9.8**

Using the information about the triangle to the right with sides a, b, c find the missing length.

9) a = 36, b = 15, c = ?

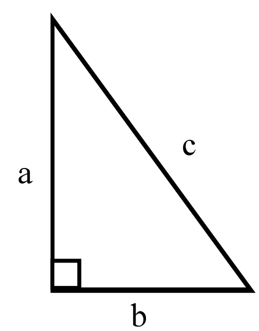
$36^2 + 15^2 = c^2$
$1296 + 225 = c^2$
$1521 = c^2$
$\sqrt{1521} = \sqrt{c^2}$

39 = c

10) a = ?, b = 40, c = 50

$a^2 + 40^2 = 50^2$
$a^2 + 1{,}600 = 2{,}500$
$-1600 \quad -1600$
$a^2 = 900$
$\sqrt{a^2} = \sqrt{900}$

a = 30

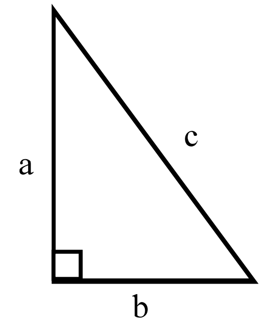


11) a = 32, b = ?, c = 40

$32^2 + b^2 = 40^2$
$1{,}024 + b^2 = 1{,}600$
$-1{,}024 \qquad - 1{,}024$
$b^2 = 576$
$\sqrt{b^2} = \sqrt{576}$

$\mathbf{b = 24}$

12) a = 30, b = 16, c = ?



$30^2 + 16^2 = c^2$
$900 + 256 = c^2$
$1156 = c^2$
$\sqrt{1156} = \sqrt{c^2}$

$\mathbf{34 = c}$

13) a = 7, b = ?, c = 14

$7^2 + b^2 = 14^2$
$49 + b^2 = 196$
$-49 \qquad - 49$
$b^2 = 147$
$\sqrt{b^2} = \sqrt{147}$
$b = \sqrt{49 \cdot 3}$

$\mathbf{b = 7\sqrt{3}} = 12.1$

14) a = 4, b = 6, c = ?

$4^2 + 6^2 = c^2$
$16 + 36 = c^2$
$52 = c^2$
$\sqrt{52} = \sqrt{c^2}$
$\sqrt{4 \cdot 13} = c$

$\mathbf{2\sqrt{13} = c} = 7.2$

15) a = 9, b = 11, c = ?

$9^2 + 11^2 = c^2$
$81 + 121 = c^2$
$202 = c^2$
$\sqrt{202} = \sqrt{c^2}$

$\mathbf{\sqrt{202} = c} = 14.2$

16) a = ?, b = 9, c = 11

$a^2 + 9^2 = 11^2$
$a^2 + 81 = 121$
$- 81 \quad - 81$
$a^2 = 40$
$\sqrt{a^2} = \sqrt{40}$
$\sqrt{a^2} = \sqrt{4 \cdot 10}$

$\mathbf{a = 2\sqrt{10}} = 6.3$

Can these measurements be the lengths of the sides of a right triangle? If not, is the triangle obtuse or acute?

17) 48, 20, and 53

$48^2 + 20^2 = 53^2$?
$2{,}304 + 400 = 2809$?
$\mathbf{2{,}704 \neq 2809}$

No, can't make a right △.
It is Obtuse.

18) 3, 4, and 5

$3^2 + 4^2 = 5^2$?
$9 + 16 = 25$?
$\mathbf{25 = 25}$

Yes, makes a right △.

19) 13, 6, and 8

$8^2 + 6^2 = 13^2$?
$48 + 36 = 169$?
$\mathbf{84 \neq 169}$

No, can't make a right △.
It is Obtuse.

20) 11, 16, and 6

$11^2 + 6^2 = 16^2$?
$121 + 36 = 256$?
$157 \neq \mathbf{256}$

No, can't make a right △.
It is Obtuse.

21) 5, 12, and 13

$5^2 + 12^2 = 13^2$?
$25 + 144 = 169$?
$\mathbf{169 = 169}$

Yes, makes a right △.

22) 17, 13, and 11

$13^2 + 11^2 = 17^2$?
$169 + 121 = 289$?
$\mathbf{290 \neq 289}$

No, can't make a right △.
It is Acute.