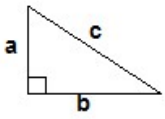
THINGS TO KNOW FOR THE TEST OVER RIGHT TRIANGLES

Pythagorean Theorem



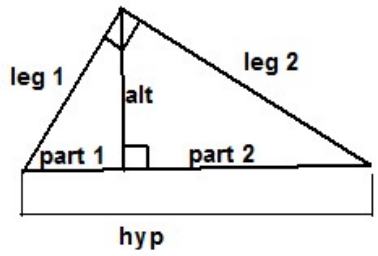
$c^2 = a^2 + b^2$

Converse of the Pythagorean Theorem

$c^2 = a^2 + b^2$ right triangle
$c^2 > a^2 + b^2$ obtuse triangle
$c^2 < a^2 + b^2$ acute triangle

GEOMETRIC MEAN

x is the geometric mean iff: $\frac{a}{x} = \frac{x}{b}$



$\frac{part1}{alt} = \frac{alt}{part2}$

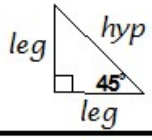
$\frac{part1}{leg1} = \frac{leg1}{hyp}$

$\frac{part2}{leg2} = \frac{leg2}{hyp}$

45-45-90 triangles

$legs \cong$

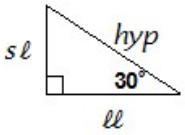
$hyp = leg\sqrt{2}$



30-60-90 triangles

$\ell\ell = s\ell\sqrt{3}$

$hyp = s\ell * 2$



REVIEW RIGHT TRIANGLES
GEOMETRIC MEAN, PYTHAGOREAN THEOREM, AND SPECIAL RIGHT TRIANGLES

SIMPLIFY THE EXPRESSION.

1) $\sqrt{5480}$ $2\sqrt{1370}$

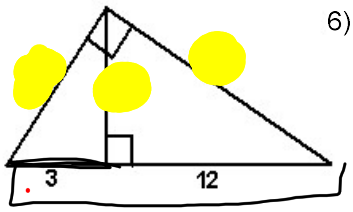
2) $\sqrt{\frac{450}{20}}$ $\frac{3\sqrt{10}}{2}$

3) $\sqrt{845}$ $13\sqrt{5}$

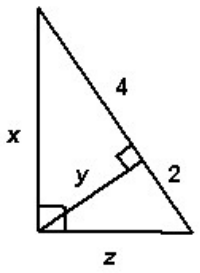
4) $\sqrt{\frac{27}{2}}$ $\frac{3\sqrt{6}}{2}$

FIND THE VALUES OF x, y, and z. EXPRESS EACH ANSWER IN SIMPLEST FORM.

5) $x = 6$
$y = 3\sqrt{5}$
$z = 6\sqrt{5}$

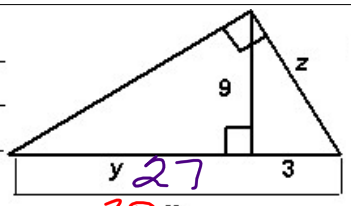


6) $x = 2\sqrt{6}$
$y = 2\sqrt{2}$
$z = 2\sqrt{3}$

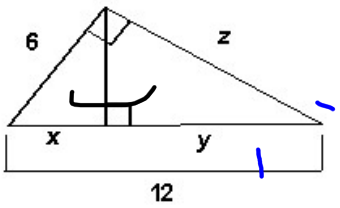


$\frac{3}{x} = \frac{x}{12}$ $\frac{3}{y} = \frac{y}{15}$ $\frac{12}{z} = \frac{z}{15}$

7) x = 30
y = 27
z = $3\sqrt{10}$



8) x = 3
y = 9
z = $6\sqrt{3}$



alt.

$\frac{y}{9} = \frac{9}{3}$

$3y = 81$

$y = 27$

$\frac{3}{z} = \frac{z}{30}$

$z^2 = 90$

$z = \sqrt{90}$

DETERMINE WHETHER THE GIVEN LENGTHS OF THE SIDES OF A TRIANGLE ARE THE SIDES OF A RIGHT TRIANGLE, ACUTE TRIANGLE, OR AN OBTUSE TRIANGLE.

9) 6, 8, 10 Right

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

$10^2 \stackrel{?}{=} 6^2 + 8^2$

$100 \stackrel{?}{=} 36 + 64$

$100 = 100$

10) 5, 7, 6 Acute

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

$7^2 \stackrel{?}{=} 6^2 + 5^2$

$49 \stackrel{?}{=} 36 + 25$

$49 < 61$

11) 5, $5\sqrt{3}$, 10 Right

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

$10^2 \stackrel{?}{=} 5^2 + (5\sqrt{3})^2$

$100 \stackrel{?}{=} 25 + 75$

$100 = 100$

$c^2 = $ Rt. $\triangle$

$c^2 > $ Obtuse

$c^2 < $ Acute

$5, 5\sqrt{3}, 10$

$c^2 \quad a^2 + b^2$

$10^2 \quad 5^2 + (5\sqrt{3})^2$

$100 \quad 25 + 75$

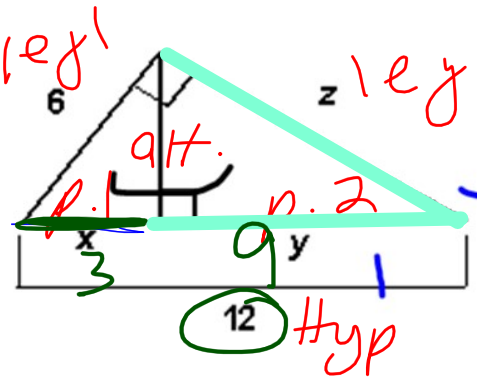
$100 = 100$

Rt. $\triangle$

3) $x = 3$

$y = 9$

$z = 6\sqrt{3}$



$z = \sqrt{108}$

$\frac{\text{leg}}{x} = \frac{6}{12}$

$\frac{12x}{12} = \frac{36}{12}$

$x = 3$

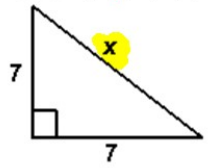
$\frac{\text{leg}}{9} = \frac{z}{12}$

$\frac{9}{z} = \frac{z}{12}$

$\sqrt{z^2} = \sqrt{108}$

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

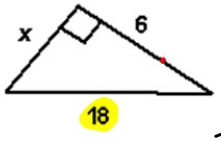
12) $x = 7\sqrt{2}$



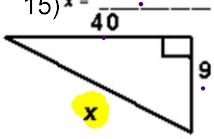
13) $x = 12$

Hyp

14) $x = 12\sqrt{2}$



15) $x = 41$



$13^2 = x^2 + 5^2$

$169 = x^2 + 25$

$-25 \quad -25$

$\sqrt{144} = \sqrt{x^2}$

$12 = x$

(14) $18^2 = x^2 + 6^2$

$324 = x^2 + 36$

$-36 \quad -36$

$\sqrt{288} = \sqrt{x^2}$

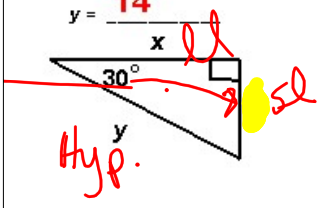
$12\sqrt{2} = x$

$x^2 = 9^2 + 40^2$

$x^2 = 81 + 1600$

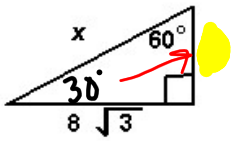
$\sqrt{x^2} = \sqrt{1681}$

16) $x = 7\sqrt{3}$, $y = 14$



Hyp. ll sl

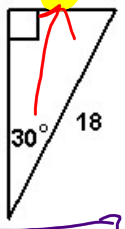
17) $x = 16$, $y = 8$



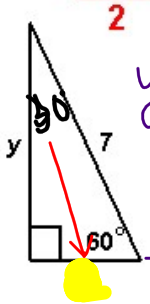
18) $x = 9$, $y = 9\sqrt{3}$

$y = x\sqrt{3}$

$18 = x \cdot 2$



19) $x = \frac{7}{2}$, $y = \frac{7\sqrt{3}}{2}$

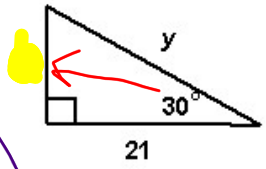


$y = x\sqrt{3}$

$7 = x \cdot 2$

$\frac{7}{2} = x$

20) $x = 7\sqrt{3}$, $y = 14\sqrt{3}$



$y = \frac{7}{2}\sqrt{3}$

30-60-90 Δs

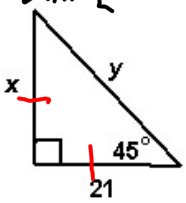
ll = sl$\sqrt{3}$

hyp = sl · 2

21) $x = 21$, $y = 21\sqrt{2}$

$y = 21\sqrt{2}$

21

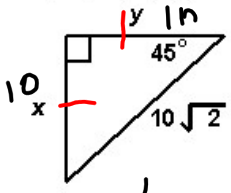


45-45-90 Δs

legs $\cong$

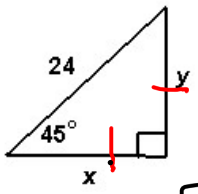
hyp = leg$\sqrt{2}$

22) $x = 10$, $y = 10$



$\frac{10\sqrt{2}}{\sqrt{2}} = \frac{x\sqrt{2}}{\sqrt{2}}$

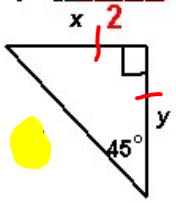
23) $x = 12\sqrt{2}$, $y = 12\sqrt{2}$



$\frac{24}{\sqrt{2}} = \frac{x\sqrt{2}}{\sqrt{2}}$

$x = 12\sqrt{2}$

24) $x = \frac{9\sqrt{2}}{2}$, $y = \frac{9\sqrt{2}}{2}$



Find geometric mean between 12 & 18

$\frac{12}{x} = \frac{x}{18}$

$\sqrt{x^2} = \sqrt{216}$

$6\sqrt{6}$