

Becca wants to make mix juice and soda punch. She can buy fruit juice for \$3 a gallon and soda for \$4 a gallon. If she wants to make 28 gallons of punch at a cost of \$3.25 a gallon, how many gallons of fruit juice and how many gallons of soda should she buy?

How much @  
 $3\% - x$   
 $5\% \rightarrow 20,000 - x$

Stacey has \$20,000 to invest in two different bank accounts. One account pays interest at 3% per year and the other account pays 5% per year. How much should she invest in each account if she want to earn 4.5% interest per year on the total amount?

$$.03x + .05(20,000 - x) = (.045)(20,000)$$

$$.03x + 1000 - .05x = 900$$

$$-.02x + 1000 = 900$$

$$-.02x = -100$$

$$2x = 10,000$$

$$x = 5000$$

\$5000 - 3%

\$15,000 → 5%

3.2% x

8% 8000 - x

Marco has \$8000 to save or his daughter's college education. He wants to divide it between one account that pays 3.2% interest and the other account pays 8% interest per year. How much should he invest in each account if he wants the interest on the total investment to be 6.5%.

$$.032x + .08(8000 - x) = .065(8000)$$

$$.032x + 640 - .08x = 520$$

$$32x + 640,000 - 80x = 520,000$$

$$-48x = -120,000$$

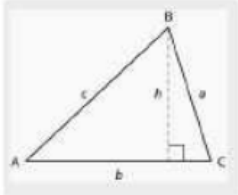
$$x = 2,500$$

\$2500 @ 3.2%

\$5500 @ 8%

What you will learn about:  
Solving Geometric Applications:  
Triangles, Rectangles, Pythagorean Theorem

Triangle Property



Angle Measure:

$$\angle A + \angle B + \angle C = 180$$

Perimeter:

$$P = a + b + c$$

Area:

$$A = \frac{1}{2}bh$$

$$= \frac{bh}{2}$$

Right Triangle

$\Delta$  that has  
one Right  $\angle$ .  
 $Rt \angle = 90^\circ$

$$m\angle 1 = 90$$

$$m\angle 2 = x = 35$$

$$m\angle 3 = x + 20 = 55$$

Measure of two angles of a triangle are 55 and 82 degrees. Find the measure of the third angle.



$$82 + 55 + x = 180$$

$$137 + x = 180$$

$$\begin{array}{r} 137 + x = 180 \\ -137 \quad -137 \\ \hline \end{array}$$

$$x = 43$$

The perimeter of a triangular garden is 24 feet. The lengths of two sides are four feet and nine feet. How long is the third side?

$$P = a + b + c$$

$$24 = 4 + 9 + c$$

$$P = 4 + 9 + c$$

$$24 = 13 + c$$

$$c = 11 \text{ ft}$$

The area of a triangular church window is 90 square meters. The base of the window is 15 meters. What is the new window's height?

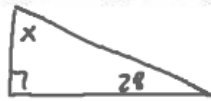
$$A = \frac{1}{2}bh$$

$$h = 12 \text{ m}$$

$$2(90) = \left(\frac{1}{2}(15)(h)\right)^2$$

$$180 = 15h$$

One angle of a right triangle is 28°. What is the measure of the third angle?



$$x + 28 = 90$$

$$x = 62$$

$$\begin{array}{r} x + 28 + 90 = 180 \\ -90 \quad -90 \\ \hline \end{array} \quad x + 28 = 90$$

The measure of one angle of a right triangle is 20 degrees more than the measure of the smallest angle. Find the measure of all three angles.

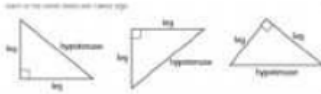
$$x + x + 20 + 90 = 180$$

$$2x + 110 = 180$$

$$2x = 70$$

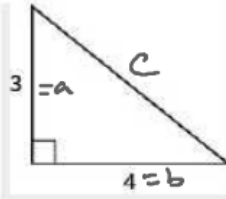
$$x = 35$$

Pythagorean Theorem



Has to be rt  $\Delta$   
 Hypotenuse - Longest  
 (opposite rt  $\angle$ ) side  
 $a^2 + b^2 = c^2$

Use the Pythagorean Theorem to find the length of the hypotenuse shown below.



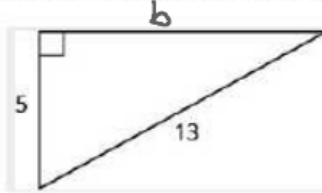
$$3^2 + 4^2 = c^2$$

$$9 + 16 = c^2$$

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

$$c = 5$$

Use the Pythagorean Theorem to find the length of the leg shown below.



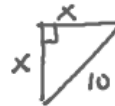
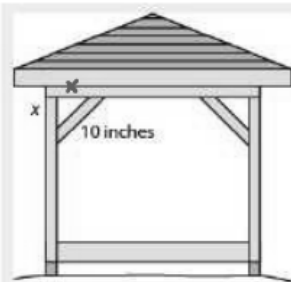
$$5^2 + b^2 = 13^2$$

$$25 + b^2 = 169$$

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

$$b = 12$$

Kelvin is building a gazebo and wants to brace each corner by placing 10" piece of wood diagonally as shown above. If he fastens the wood so that the ends of the brace are the same distance from the corner, what is the length of the legs of the right triangle formed? Approximate to the nearest tenth of an inch.



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

$$\frac{2x^2}{2} = \frac{100}{2}$$

$$\sqrt{x^2} = \sqrt{50}$$

$$x = \sqrt{50} \approx 7.1 \text{ inches}$$

John puts the base of a 13-foot ladder five feet from the wall of his house as shown below. How far up the wall does the ladder reach?



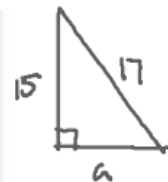
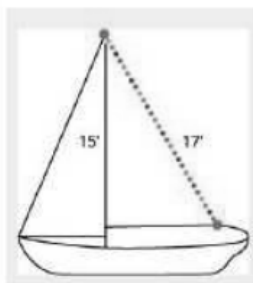
$$13^2 = 5^2 + h^2$$

$$169 = 25 + h^2$$

$$144 = h^2$$

$$h = 12 \text{ ft}$$

Randy want to attach a 17 foot string of lights to the top of the 15 foot mast of his sailboat, as shown below. How far from the base of the mast should he attach the end of the string?



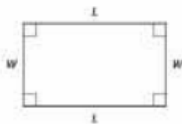
$$a^2 + 15^2 = 17^2$$

$$a^2 + 225 = 289$$

$$a^2 = 64$$

$$a = 8 \text{ ft}$$

Rectangles



Properties

Perimeter

Area