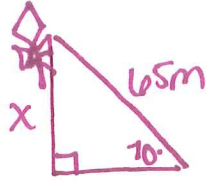


Review and Angle of Elevation & Depression Worksheet

Key

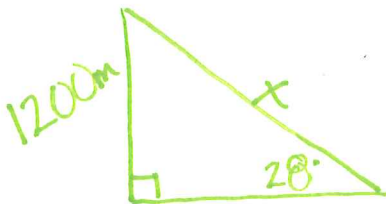
1. Brian's kite is flying above a field at the end of 65 m of string. If the angle of elevation to the kite measures  $70^\circ$ , how high is the kite above Brian's head? Draw the picture 1<sup>st</sup>! Round to the nearest tenth.



$$\sin(70) = \frac{x}{65}$$

$$x \approx 61.1m$$

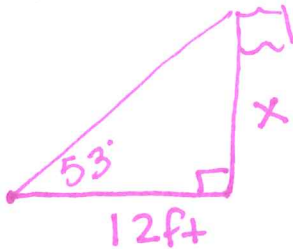
2. From an airplane at an altitude of 1200 m, the angle of depression to a building on the ground measures  $28^\circ$ . Find the distance from the plane to the building. Round to the nearest tenth. Draw the picture 1<sup>st</sup>!



$$\sin(28) = \frac{1200}{x}$$

$$x \approx 2556.1m$$

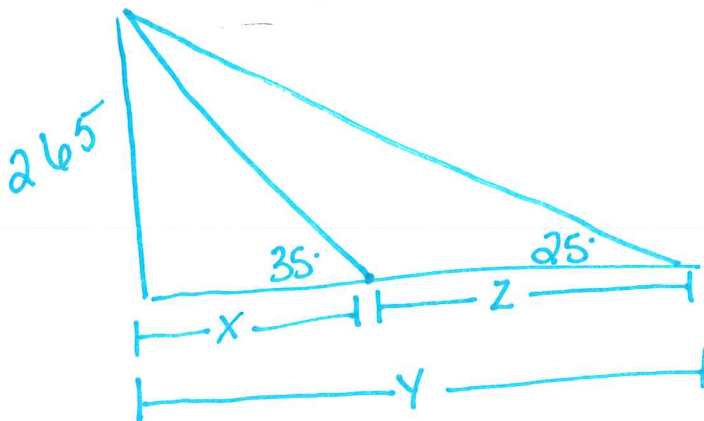
3. From a point on the ground 12 ft from the base of a flagpole, the angle of elevation of the top of the pole measures  $53^\circ$ . How tall is the flagpole? Round to the nearest tenth. Draw the picture 1<sup>st</sup>!



$$\tan(53) = \frac{x}{12}$$

$$x \approx 15.9ft$$

4. From a plane flying due east at 265 m above sea level, the angles of depression of two ships sailing due east measure  $35^\circ$  and  $25^\circ$ . How far apart are the ships? Round to the nearest tenth. Draw the picture 1<sup>st</sup>!



$$\tan(35) = \frac{265}{x}$$

$$x \approx 378.5m$$

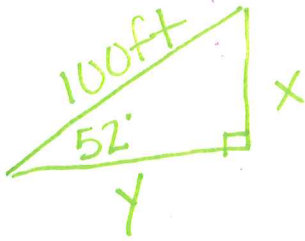
$$\tan(25) = \frac{265}{y}$$

$$y \approx 568.3m$$

Final Answer  $568.3 - 378.5$

189.8m

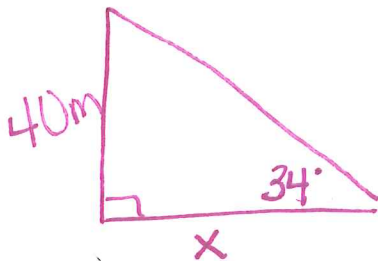
5. A man flies a kite and lets out 100 feet of string. The angle of elevation of the string is  $52^\circ$ . How high off the ground is the kite? How far away is the man from the spot directly under the kite? Round to the nearest tenth. Draw the picture 1<sup>st</sup>!



$$\sin(52^\circ) = \frac{x}{100} \quad \boxed{x = 78.8 \text{ft}}$$

$$\cos(52^\circ) = \frac{y}{100} \quad \boxed{y = 61.6 \text{ft}}$$

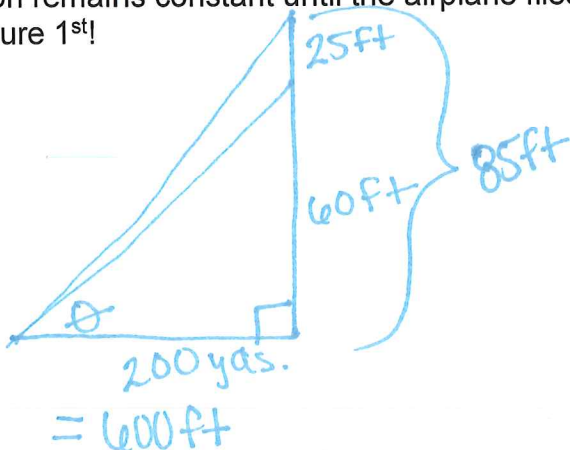
6. From the top of a vertical cliff 40 m high, the angle of depression of an object that is level with the base of the cliff is  $34^\circ$ . How far is the object from the base of the cliff? Round to the nearest tenth. Draw the picture 1<sup>st</sup>!



$$\tan(34^\circ) = \frac{40}{x}$$

$$\boxed{x \approx 59.3 \text{m}}$$

7. An airplane takes off 200 yards in front of a 60 foot building. At what angle of elevation must the plane take off in order to avoid crashing into the building? It must clear the building by 25 feet to not do any damage to the building. Assume that the airplane flies in a straight line and the angle of elevation remains constant until the airplane flies over the building. Round to the nearest tenth. Draw the picture 1<sup>st</sup>!



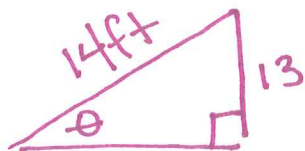
$$1 \text{yd} = 3 \text{ft}$$

$$\tan \theta = \frac{85}{600}$$

$$\theta = \tan^{-1}\left(\frac{85}{600}\right)$$

$$\boxed{\theta \approx 8.1^\circ}$$

8. A 14 foot ladder is used to scale a 13 foot wall. At what angle of elevation must the ladder be situated in order to reach the top of the wall? Round to the nearest tenth. Draw the picture 1<sup>st</sup>!

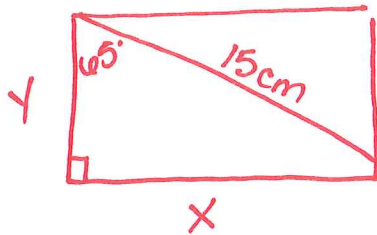


$$\sin \theta = \frac{13}{14}$$

$$\theta = \sin^{-1}\left(\frac{13}{14}\right)$$

$$\boxed{\theta \approx 68.2^\circ}$$

9. The diagonal of a rectangle is 15 cm, creating a  $65^\circ$  angle with the vertex. If the perimeter is 38 cm. What is the area of the rectangle? Round to the nearest tenth. Draw the picture 1<sup>st</sup>!



$$\sin(65) = \frac{x}{15}$$

$$x = 13.6 \text{ cm}$$

$$\cos(65) = \frac{y}{15}$$

$$y = 6.3 \text{ cm}$$

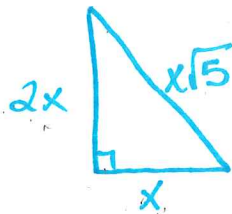
$$A = L \cdot W = 13.6 \times 6.3$$

$$A \approx 85.7 \text{ cm}^2$$

must tell them to cross off this info.

10. One of the legs of a right triangle is twice as long as the other, and the perimeter of the triangle is 28. Find the lengths of all three sides, to three decimal places. Round to the nearest tenth. Draw the picture 1<sup>st</sup>!

5.3 and 10.7



$$(2x)^2 + x^2 = c^2$$

$$4x^2 + x^2 = c^2$$

$$5x^2 = c^2$$

$$x\sqrt{5} = c$$

$$2(5.4) = 10.8$$

$$\begin{array}{|c|} \hline 5.4 \\ \hline 10.8 \\ \hline \end{array}$$

$$\begin{array}{|c|} \hline 11.8 \\ \hline \text{or} \\ \hline 12 \\ \hline \end{array}$$

$$2x + x + x\sqrt{5} = 28$$

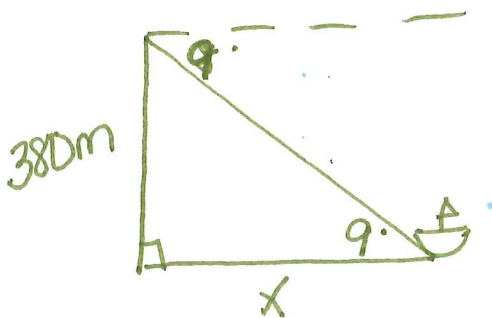
$$3x + x\sqrt{5} = 28$$

$$3x + 2.2x = 28$$

$$5.2x = 28$$

$$x \approx 5.4$$

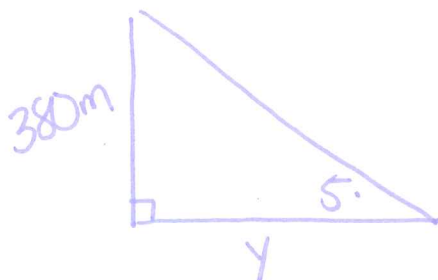
11. A) Standing on a cliff 380 meters above the sea, Pat sees an approaching ship and measures its angle of depression, obtaining 9 degrees. How far from shore is the ship? Round to the nearest tenth. Draw the picture 1<sup>st</sup>!



$$\tan(9) = \frac{380}{x}$$

$$x \approx 2399.2 \text{ m}$$

11. B) Now Pat sights a second ship beyond the first. The angle of depression of the second ship is 5 degrees. How far apart are the ships? Round to the nearest tenth. Draw the picture 1<sup>st</sup>!



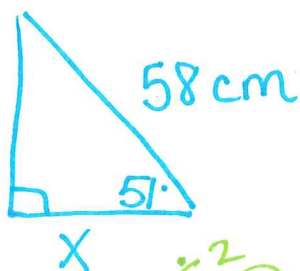
$$\tan(5) = \frac{380}{y}$$

$$y = 4343.4 \text{ m}$$

$$4343.4 - 2399.2 = 1944.2 \text{ m Apart!}$$



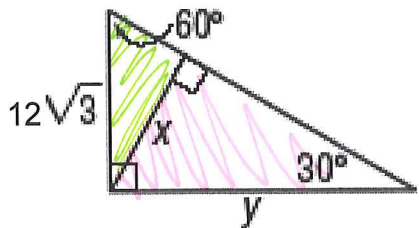
12. In a right triangle, the 58-cm hypotenuse makes a 51-degree angle with one of the legs. To the nearest tenth of a cm, how long is that leg? Draw the picture 1<sup>st</sup>!



$$\cos(51^\circ) = \frac{x}{58}$$

$$x \approx 36.5 \text{ cm}$$

13. Find x and y.



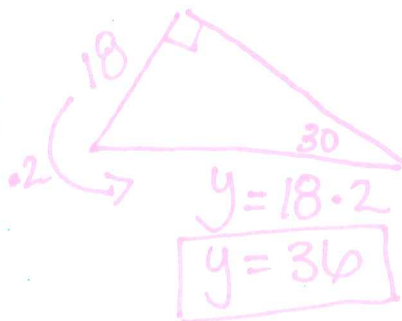
$\div 2$

$$x = 6\sqrt{3} \cdot \sqrt{3}$$

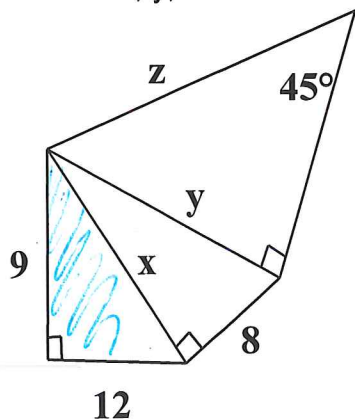
$$= 6\sqrt{9}$$

$$= 6 \cdot 3$$

$$x = 18$$



14. Find x, y, and z.



Find x

$$9^2 + 12^2 = x^2$$

$$225 = x^2$$

$$15 = x$$

Find y

$$15^2 + 8^2 = y^2$$

$$289 = y^2$$

$$17 = y$$

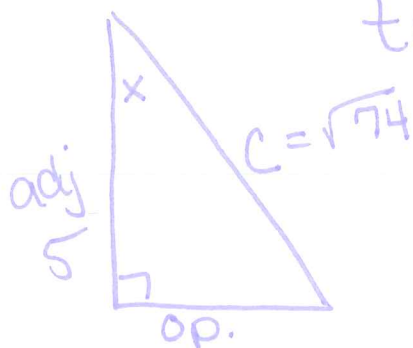
Find z

$$z = 17\sqrt{2}$$

Special Right  $\Delta$

24.0

15. In the right triangle below, if  $\tan x = \frac{7}{5}$ , what is  $\cos x$ ? What is  $\sin x$ ? (Do not find the angle measure)



$$\tan x = \frac{o}{a} = \frac{7}{5}$$

Find c

$$5^2 + 7^2 = c^2$$

$$\sqrt{74} = c$$

$$\cos x = \frac{5}{\sqrt{74}} \Rightarrow$$

$$\cos x = \frac{5\sqrt{74}}{74}$$

$$\sin x = \frac{7\sqrt{74}}{74}$$

Name: \_\_\_\_\_

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1 yard = 3ft

8. A 14 foot ladder is used to scale a 13 foot wall. At what angle of elevation must the ladder be situated in order to reach the top of the wall? Round to the nearest tenth. Draw the picture 1<sup>st</sup>!

9. The diagonal of a rectangle is 15 cm, creating a  $65^\circ$  angle with the vertex. ~~If the perimeter is 36 cm.~~  
What is the area of the rectangle? Round to the nearest tenth. Draw the picture 1<sup>st</sup>!

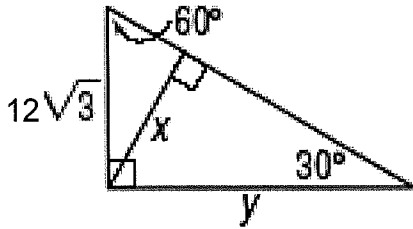
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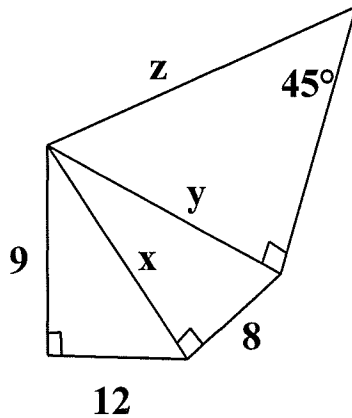
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13. Find  $x$  and  $y$ .



14. Find  $x$ ,  $y$ , and  $z$ .



15. In the right triangle below, if  $\tan x = \frac{7}{5}$ , what is  $\cos x$ ? What is  $\sin x$ ? (Do not find the angle measure)

