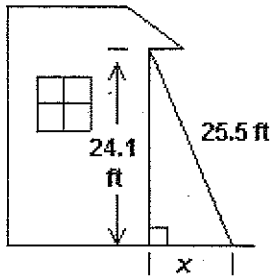


Unit 8 Review

1. A 25.5 foot ladder rests against the side of a house at a point 24.1 feet above the ground. The foot of the ladder is x feet from the house. Find the value of x to one decimal place.



$$24.1^2 + x^2 = 25.5^2$$

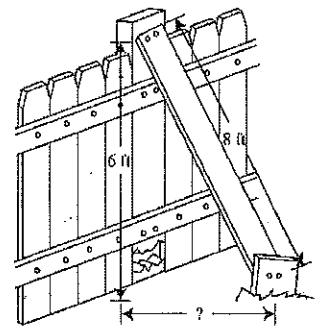
$$x = 8.3$$

2. A board 8 feet long is to be used as a temporary brace for a section of fence that has a broken post: If the board is nailed to the fence 6 feet above ground level, about how far from the base of the fence is the other end of the board when it is fastened to a stake in the ground?

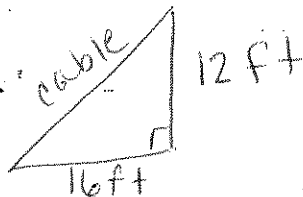
$$6^2 + x^2 = 8^2$$

$$x = \sqrt{28} < \frac{4}{7}$$

$$= 2\sqrt{7}$$



3. A radio station is going to construct a 12-foot tower on top of a building. The tower will be supported by three cables, each attached to the top of the tower and to points on the roof of the building that are 16 feet from the base of the tower. Find the total length of the three cables.



$$12^2 + 16^2 = x^2$$

$$x = 20$$

$$\begin{array}{r} 20 \\ \times 3 \\ \hline 60 \text{ feet} \end{array}$$

4. Choose the set that is the possible side lengths of a right triangle.

a. 1, 1, 2

$$1^2 + 1^2 \stackrel{?}{=} 2^2 \text{ No!}$$

c. 3, 4, 7

$$3^2 + 4^2 \stackrel{?}{=} 7^2 \text{ No!}$$

b. 1, 1, $\sqrt{2}$

$$1^2 + 1^2 = (\sqrt{2})^2 \text{ Yes}$$

d. 3, 5, 9

$$3^2 + 5^2 \stackrel{?}{=} 9^2 \text{ No}$$

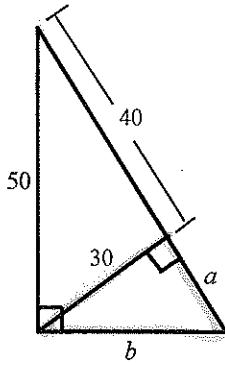
$$a^2 + b^2 = c^2$$

5. Classify a triangle with sides 16, 24, and 32 as acute, obtuse, or right.

$$32^2 \text{ — } 16^2 + 24^2$$

$$1024 \geq 832 \quad \text{obtuse}$$

6. Solve for a and b .



$$\frac{30}{b} = \frac{40}{a}$$

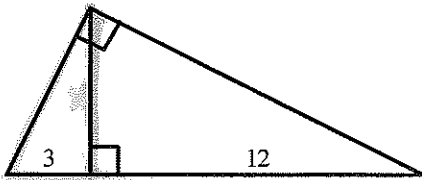
$$30a = 40b$$

$$a = \frac{40}{30}b = \frac{4}{3}b$$

$$b = 37.5$$

$$a = 22.5$$

7. Find the length of the altitude drawn to the hypotenuse.



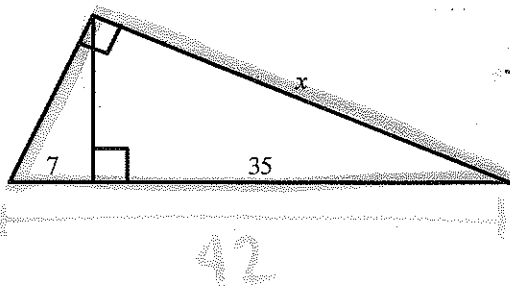
$$\frac{3}{x} = \frac{12}{x}$$

$$3x = 12^2$$

$$3x = 144$$

$$x = 48$$

8. Find the value of x .



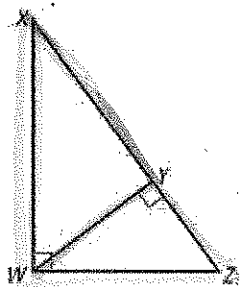
$$\frac{42}{x} = \frac{35}{7}$$

$$42 \cdot 7 = 35x$$

$$294 = 35x$$

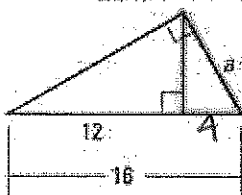
$$x = \frac{294}{35} = 7\sqrt{30}$$

9. Identify the similar triangles in the diagram.



$$\triangle XYW \sim \triangle XWZ$$

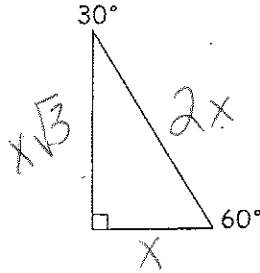
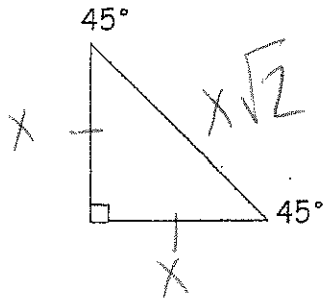
10. Find the value of the variable in the diagram.



$$a^2 = 64$$

$$a = 8$$

11. Fill in the general form for each of the special right triangles.



12. Which of the following cannot be the lengths of a 30°-60°-90° triangle?

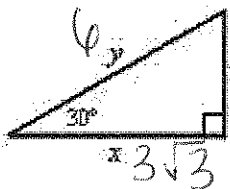
a. $\frac{21}{13}, \frac{42}{13}, \frac{21}{13}\sqrt{3}$

c. $27, 54, 27\sqrt{3}$

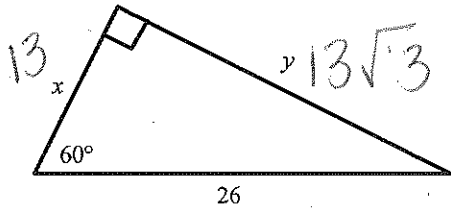
b. $23, 46, 46\sqrt{3}$

d. $6, 12, 6\sqrt{3}$

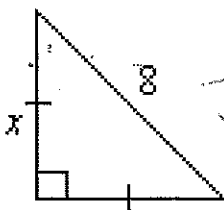
13. Find the value of x and y.



14. Find the value of x and y.



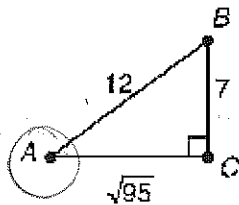
15. Find the value of x.



$$\frac{8}{\sqrt{2}} = \frac{x\sqrt{2}}{\sqrt{2}}$$

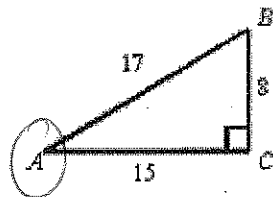
$$\frac{8}{\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}} = \frac{8\sqrt{2}}{2} = 4\sqrt{2}$$

16. The tangent of $\angle B$ is $\frac{7}{\sqrt{95}} \cdot \frac{\sqrt{95}}{\sqrt{95}} = \frac{7\sqrt{95}}{95}$



toa

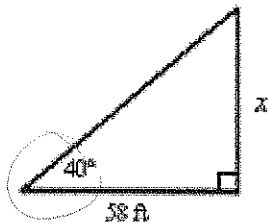
17. Find $\tan A$ for the right triangle.



toa

$$\frac{8}{15}$$

18. A photographer shines a camera light at a particular painting forming an angle of 40° with the camera platform. If the light is 58 feet from the wall where the painting hangs, how high above the platform is the painting?

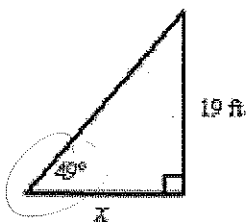


toa

$$58 \tan 40 = \frac{x}{58} \cdot 58$$

$$x = 48.7 \text{ ft}$$

19. A tree 19 feet tall casts a shadow which forms an angle of 49° with the ground. How long is the shadow to the nearest hundredth?

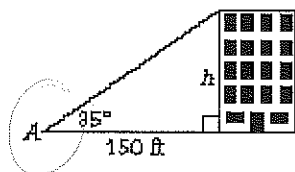


$$x \cdot \tan 49 = \frac{19}{x} \cdot x$$

$$\frac{x \tan 49}{\tan 49} = \frac{19}{\tan 49}$$

$$x = 16.5 \text{ ft}$$

20. Find the height of the building when $\angle A = 35^\circ$.



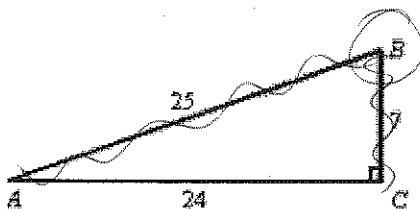
$$150 \tan 35 = \frac{h}{150} \cdot 150$$

$$h = 105 \text{ ft}$$

21. Write $\cos B$.

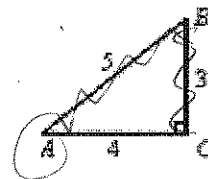
cah

$$\cos B = \frac{7}{25}$$

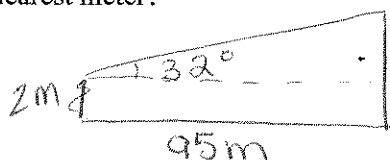


22. Write $\sin A$.

$$\sin A = \frac{3}{5}$$



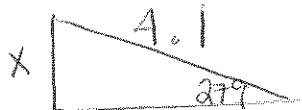
23. To find the height of a tower, a surveyor positions a transit that is 2 meters tall at a spot 95 meters from the base of the tower. She measures the angle of elevation to the top of the tower to be 32° . What is the height of the tower, to the nearest meter?



$$x \text{ tower } 95 \tan 32 = \frac{x}{95} \cdot 95$$

$$x = 59.4 = \boxed{57.4 \text{ m}}$$

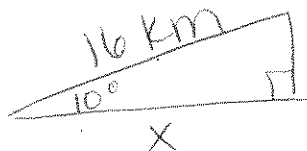
24. A slide 4.1 m long makes an angle of 27° with the ground. How high is the top of the slide above the ground?



$$4.1 \cdot \sin 27 = \frac{x}{4.1} \cdot 4.1$$

$$x = 1.9 \text{ m}$$

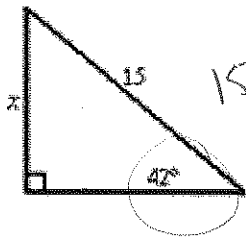
25. Liola drives 16 km up a hill that is at a grade of 10° . What horizontal distance, to the nearest tenth of kilometer, has she covered?



$$16 \cos 10 = \frac{x}{16} \cdot 16$$

$$x = 15.8 \text{ km}$$

26. What is x to the nearest hundredth? (not drawn to scale)

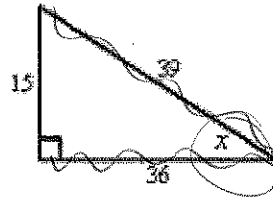


$$15 \cdot \sin 42 = \frac{x}{15} \cdot 15$$

$$x = 10.04$$

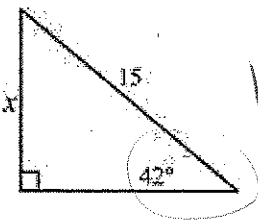
27. Use the diagram to find $\cos x$ as a fraction in simplest form.

$$\cos x = \frac{36}{39} = \frac{12}{13}$$



28. Find x . Round the result to the nearest hundredth.

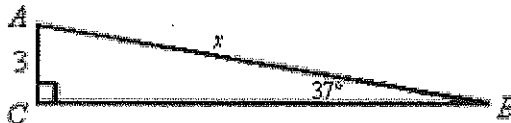
same as #26



$$15 \cdot \sin 42 = \frac{x}{15} \cdot 15$$

$$x = 10.04$$

29. Find the value of x , to the nearest whole number. (not drawn to scale)

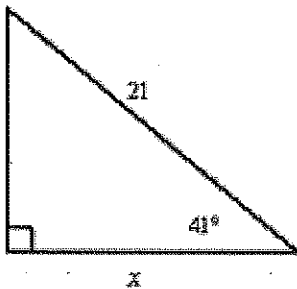


$$x \cdot \sin 37 = \frac{3}{x} \cdot x$$

$$\frac{x \sin 37}{\sin 37} = \frac{3}{\sin 37}$$

$$x = 5$$

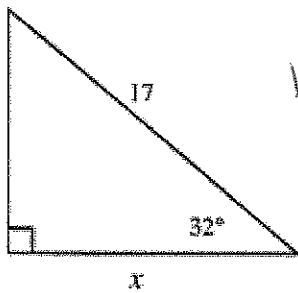
30. Find x , to the nearest hundredth.



$$21 \cdot \cos 41 = \frac{x}{21} \cdot 21$$

$$x = 15.85$$

31. Find the value of x , to the nearest hundredth.



$$17 \cdot \cos 32 = \frac{x}{17} \cdot 17$$

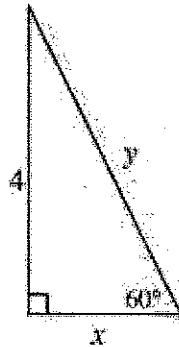
$$x = 14.4$$

32. Find the missing side lengths for x and y .

* use special right \triangle

$$\frac{4}{\sqrt{3}} = \frac{x\sqrt{3}}{\sqrt{3}}$$

$$\frac{4}{\sqrt{3}} \cdot \frac{\sqrt{3}}{\sqrt{3}} = \frac{4\sqrt{3}}{3} = x$$



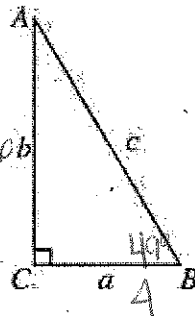
$$\frac{4\sqrt{3}}{3} \cdot 2 = \frac{8\sqrt{3}}{3} = y$$

33. Solve $\triangle ABC$ using the diagram and the given measurements.

(Note: The triangle is not drawn to scale.)

$B = 49^\circ$, $a = 4$

* MULTIPLE WAYS *



$$b: 4.6 \cdot \tan 49 = \frac{b}{1} \cdot 4$$

$$b = 4.6$$

$$\angle A: 180 - 49 - 90 = 41^\circ$$

$$c: c \sin 49 = \frac{4.6 \cdot c}{c}$$

$$\frac{c \cdot \sin 49}{\sin 49} = \frac{4.6}{\sin 49}$$

$$c = 6.1$$