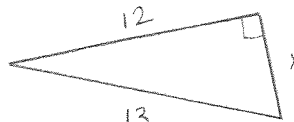


Answer Key

Chapter 7.1:

Find the unknown side length. Simplify answers that are radicals.


1. 

$$12^2 + x^2 = 13^2$$

$$144 + x^2 = 169$$

$$\begin{array}{r} -144 \\ \hline x^2 = 25 \end{array}$$

$x = 5$

2. 

$$10^2 + 24^2 = x^2$$

$$100 + 576 = x^2$$

$$\sqrt{676} = \sqrt{x^2}$$

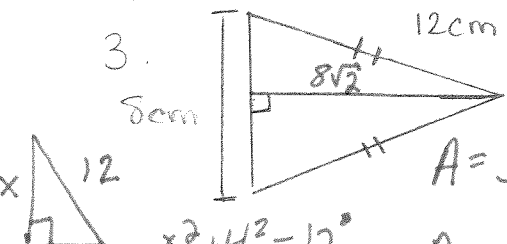
$$x = \sqrt{676}$$

$$\begin{array}{r} 26 \\ 4 \overline{) 169} \\ \underline{8} \\ 89 \\ \underline{80} \\ 90 \\ \underline{80} \\ 100 \\ \underline{96} \\ 40 \\ \underline{40} \\ 0 \end{array}$$

$x = 2 \cdot 13 = 26$

Find the area of the figure. Round decimal answers to the nearest tenth

$$A_{\Delta} = \frac{(b_1 + b_2) \cdot h}{2}$$

3. 

$$x^2 + 4^2 = 12^2$$

$$x^2 + 16 = 144$$

$$\begin{array}{r} -16 \\ \hline x^2 = 128 \end{array}$$

$$\sqrt{x^2} = \sqrt{128}$$

$$\begin{array}{r} 11.31 \\ 8 \overline{) 88} \\ \underline{72} \\ 16 \end{array}$$

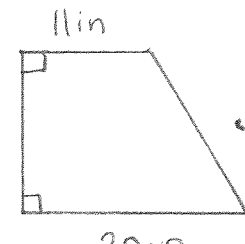
$x = 8\sqrt{2}$

$$A = \frac{b \cdot h}{2}$$

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

$$A = 32\sqrt{2}$$

$\approx 45.3 \text{ cm}^2$

4. 

$$A = \frac{(11 + 20) \cdot 14}{2}$$

$$A = \frac{31 \cdot 14}{2}$$

$A = 217 \text{ in}^2$

Chapter 7.2:

Decide whether the numbers can represent a triangle. If they can, classify it as acute, obtuse or right.

5. 5, 13, 12

Check if Δ $5 + 12 > 13$ ✓

$$5^2 + 12^2 \stackrel{?}{=} 13^2$$

$$25 + 144 \stackrel{?}{=} 169$$

$$169 = 169$$

right Δ

6. $\sqrt{8}, 4, 6$

$$2.8 + 4 > 6$$
 ✓
$$(\sqrt{8})^2 + 4^2 \stackrel{?}{=} 6^2$$

$$8 + 16 = 36$$

obtuse

7. 28, 21, 20

$$21 + 20 > 28$$
 ✓
$$20^2 + 21^2 \stackrel{?}{=} 28^2$$

$$841 > 784$$

acute

8. 15, 39, 36

Check if Δ $15 + 36 > 39$ ✓

$$15^2 + 36^2 \stackrel{?}{=} 39^2$$

$$225 + 1296 \stackrel{?}{=} 1521$$

$$1521 = 1521$$

right Δ

9. $\sqrt{13}, 10, 12$

$$3.6 + 10 > 12$$
 ✓
$$\sqrt{13}^2 + 10^2 \stackrel{?}{=} 12^2$$

$$13 + 100 \stackrel{?}{=} 144$$

obtuse

10. 40, 50, 14

$$14 + 40 > 50$$
 ✓
$$14^2 + 40^2 \stackrel{?}{=} 50^2$$

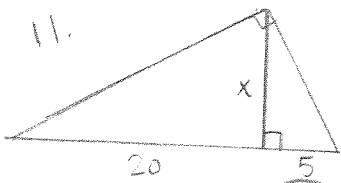
$$196 + 1600 \stackrel{?}{=} 2500$$

$$1796 < 2500$$

obtuse

Chapter 7.3:

Find the value of x . Round decimals to the nearest tenth.



$$\frac{20}{x} = \frac{x}{5} \quad \sqrt{x^2} = \sqrt{100}$$

$$x = 10$$



$$10^2 + 24^2 = y^2$$

$$100 + 576 = y^2$$

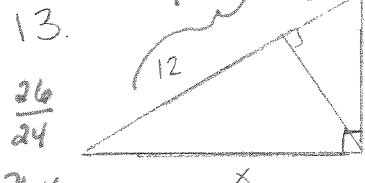
$$\sqrt{676} = \sqrt{y^2}$$

$$26 = y$$

$$\frac{10}{x} = \frac{26}{24}$$

$$\frac{240}{26} = \frac{26x}{26}$$

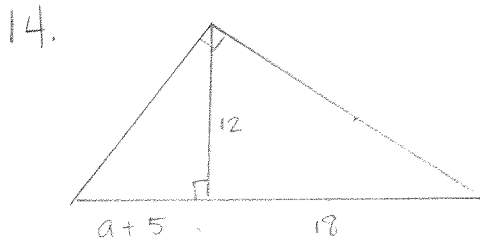
$$9.2 = x$$



$$\frac{12}{x} = \frac{x}{15}$$

$$\sqrt{x^2} = \sqrt{180}$$

$$x = 13.4$$



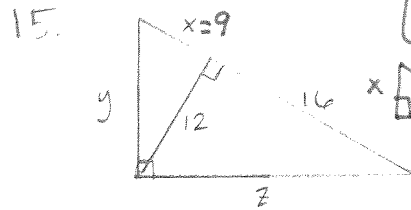
$$\frac{a+5}{12} = \frac{12}{18}$$

$$\frac{18(a+5)}{18} = \frac{144}{18}$$

$$a+5 = 8$$

$$-5 \quad -5$$

$$a = 3$$

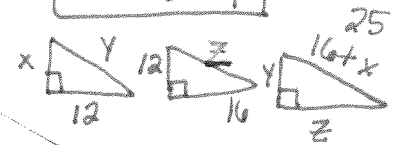


$$9^2 + 12^2 = y^2$$

$$81 + 144 = y^2$$

$$\sqrt{225} = \sqrt{y^2}$$

$$y = 15$$



$$\frac{16}{12} = \frac{12}{x}$$

$$\frac{16x}{16} = \frac{144}{16}$$

$$x = 9$$

$$12^2 + 16^2 = z^2$$

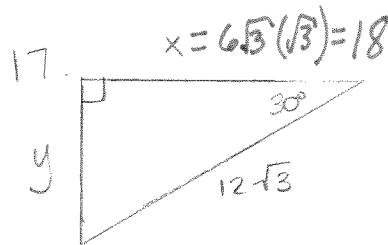
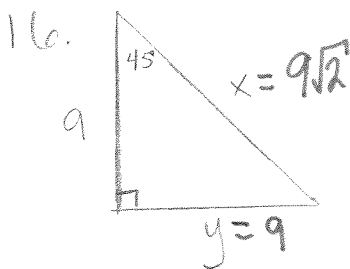
$$144 + 256 = z^2$$

$$\sqrt{400} = \sqrt{z^2}$$

$$20 = z$$

Chapter 7.4:

Find the value of x and y . Write your answer in simplest radical form.



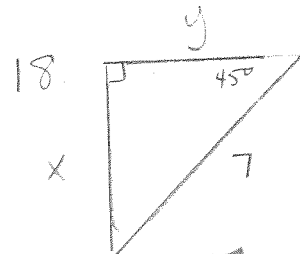
$$2y = \text{hyp.}$$

$$\frac{2y}{2} = \frac{12\sqrt{3}}{2}$$

$$y = 6\sqrt{3}$$

$$x = 6\sqrt{3}(\sqrt{3})$$

$$x = 6 \cdot 3 = 18$$



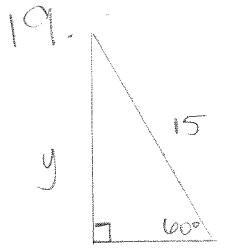
$$x \cdot \frac{\sqrt{2}}{\sqrt{2}} = \frac{7}{\sqrt{2}}$$

$$x = \frac{7}{\sqrt{2}} \left(\frac{\sqrt{2}}{\sqrt{2}} \right)$$

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

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

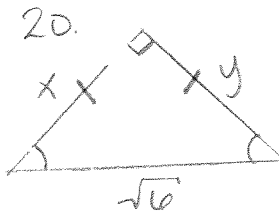
Continued...



$$\frac{2x}{2} = \frac{15}{2}$$

$$x = \frac{15}{2}$$

$$y = \frac{15\sqrt{3}}{2}$$

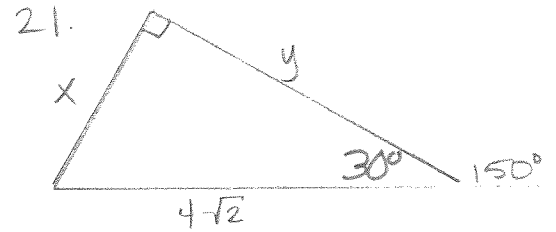


$$\frac{x\sqrt{2}}{\sqrt{2}} = \frac{\sqrt{6}}{\sqrt{2}} \left(\frac{\sqrt{2}}{\sqrt{2}}\right)$$

$$x = \frac{\sqrt{12}}{2} = \frac{\sqrt{4 \cdot 3}}{2} = \frac{2\sqrt{3}}{2}$$

$$y = \sqrt{3}$$

$$x = \sqrt{3}$$



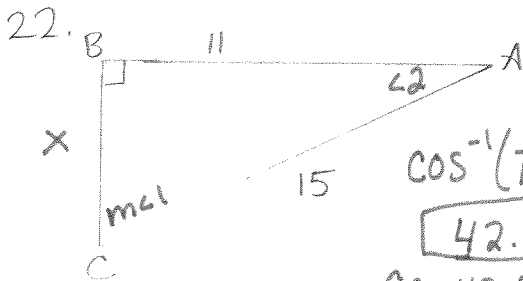
$$\frac{2x}{2} = \frac{4\sqrt{2}}{2}$$

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

$$y = 2\sqrt{2} \cdot \sqrt{3}$$

$$y = 2\sqrt{6}$$

Chapter 7.5-7.7: Solve each triangle. Round answers to the nearest tenth.



$$\cos^{-1}\left(\frac{11}{15}\right) = m\angle 2$$

$$42.8^\circ = m\angle 2$$

$$90 - 42.8 = m\angle 1$$

$$47.2^\circ = m\angle 1$$

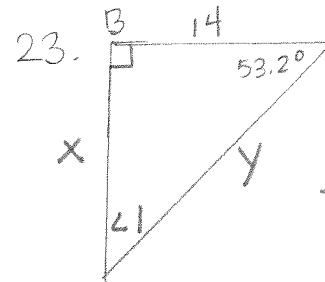
$$11^2 + x^2 = 15^2$$

$$121 + x^2 = 225$$

$$-121 \quad -121$$

$$\sqrt{x^2} = \sqrt{104}$$

$$x = 10.2$$



$$90 - 53.2 = m\angle 1$$

$$36.8^\circ = m\angle 1$$

$$\frac{\cos 53.2}{1} = \frac{14}{y}$$

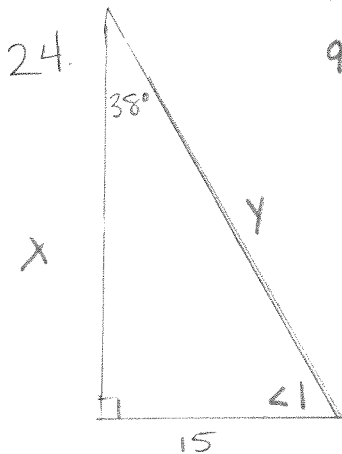
$$y = \frac{14}{\cos(53.2)}$$

$$y = 23.4$$

$$\frac{\tan 53.2}{1} = \frac{x}{14}$$

$$14 \tan 53.2 = x$$

$$18.7 = x$$



$$90 - 38 = m\angle 1$$

$$52^\circ = m\angle 1$$

$$\frac{\sin 38}{1} = \frac{15}{y}$$

$$y = \frac{15}{\sin(38)}$$

$$y = 24.4$$

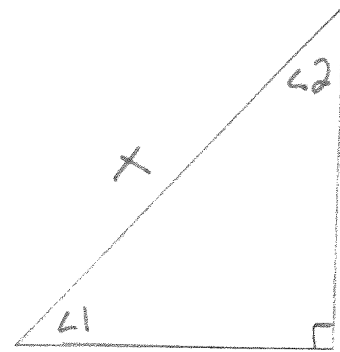
$$\frac{\tan 38}{1} = \frac{15}{x}$$

$$x = \frac{15}{\tan(38)}$$

$$x = 19.2$$

* trig functions may vary on 22-25

25.



$$20^2 + 24^2 = x^2$$

$$\sqrt{976} = \sqrt{x^2}$$

$$31.2 = x$$

$$\tan^{-1}\left(\frac{20}{24}\right) = m\angle 2$$

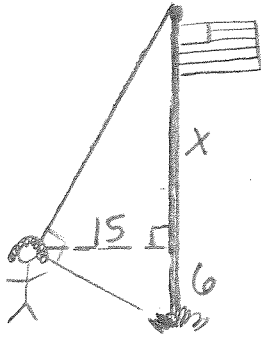
$$39.8^\circ = m\angle 2$$

$$90 - 39.8 = m\angle 1$$

$$50.2^\circ = m\angle 1$$

Word Problems:

26. Julie is 6 ft tall. If she stands 15 ft from the flagpole and holds a cardboard square, the edges of the square line up with the top and bottom of the flagpole. Approximate the height of the flagpole.



$$\frac{6}{15} = \frac{15}{x}$$

$$\frac{6x}{6} = \frac{225}{6}$$

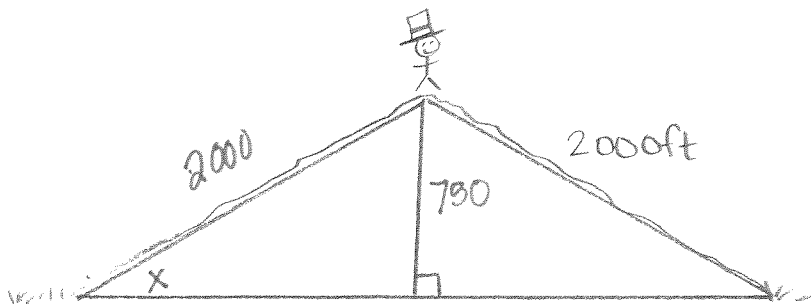
$$x = 37.5 \text{ ft}$$

$$h = x + 6$$

$$h = 37.5 + 6$$

$$h = 43.5 \text{ ft}$$

27. The length of a hill in your neighborhood is 2000 ft. The height of the hill is 750 ft. What is the angle of elevation of the hill?



$$\sin^{-1}\left(\frac{750}{2000}\right) = x$$

$$\text{angle of elev.} = 22.0^\circ$$