

## Chapter 12 Practice Test

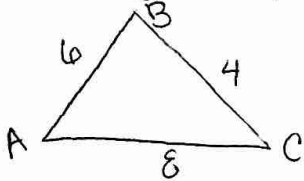
Simplify

$$1. \frac{\sqrt{8} \cdot \sqrt{3}}{\sqrt{9} \sqrt{7}} = \frac{\sqrt{24}}{\sqrt{63}} = \frac{\sqrt{4 \cdot 6}}{\sqrt{9 \cdot 7}} = \frac{2\sqrt{6}}{3\sqrt{7}} \left( \frac{\sqrt{7}}{\sqrt{7}} \right) = \frac{2\sqrt{42}}{21}$$

$$2. \frac{13}{\sqrt{26}} \left( \frac{\sqrt{26}}{\sqrt{26}} \right) = \frac{13\sqrt{26}}{26} = \frac{\sqrt{26}}{2}$$

$$3. \frac{3\sqrt{15}}{\sqrt{45}} = \frac{3\sqrt{15}}{\sqrt{9 \cdot 5}} = \frac{3\sqrt{15}}{3\sqrt{5}} = \frac{\sqrt{15}}{\sqrt{5}} = \frac{\sqrt{25 \cdot 3}}{5} = \frac{5\sqrt{3}}{5} = \sqrt{3}$$

4. Solve the triangle:  $a=4$  in,  $b=8$  in,  $c=6$  in



$$c^2 = a^2 + b^2 - 2ab \cos C$$

$$6^2 = 4^2 + 8^2 - 2(4)(8) \cos C$$

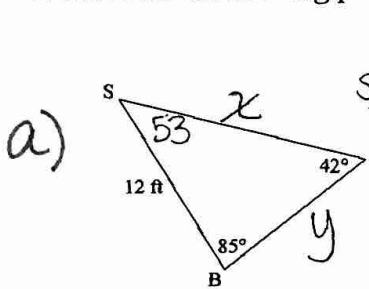
$$46 \cdot 6 = C$$

$$4^2 = a^2 + b^2 - 2ab \cos A$$

$$29 = A$$

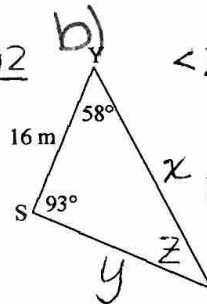
$$\begin{aligned} \angle A &= 29^\circ \\ \angle B &= 104.4^\circ \\ \angle C &= 46.6^\circ \end{aligned}$$

5. Solve for the missing pieces. Give the exact and approximate answer:



$$\frac{\sin 42}{12} = \frac{\sin 85}{x} \quad \frac{\sin 53}{y} = \frac{\sin 42}{12}$$

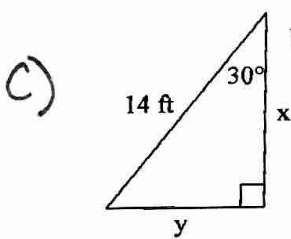
$$\begin{aligned} x &= \frac{12 \sin 85}{\sin 42} & y &= \frac{12 \sin 53}{\sin 42} \\ x &= 17.9 \text{ ft} & y &= 14.3 \text{ ft} \end{aligned}$$



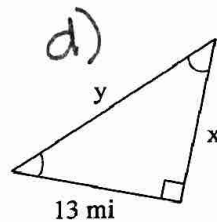
$$\angle Z = 29^\circ$$

$$\frac{\sin 58}{y} = \frac{\sin 29}{16} \quad \frac{\sin 93}{x} = \frac{\sin 29}{16}$$

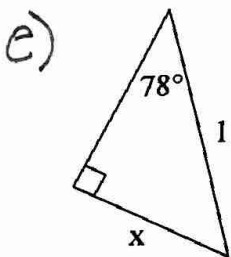
$$\begin{aligned} y &= \frac{16 \sin 58}{\sin 29} & x &= \frac{16 \sin 93}{\sin 29} \\ y &= 28 \text{ m} & x &= 33 \text{ m} \end{aligned}$$



$$\begin{aligned} y &= 7 \text{ ft} \\ x &= 7\sqrt{3} \text{ ft} \end{aligned}$$

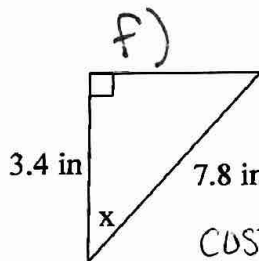


$$\begin{aligned} x &= 13 \text{ mi} \\ y &= 13\sqrt{2} \text{ mi} \end{aligned}$$



$$\sin 78 = \frac{x}{11}$$

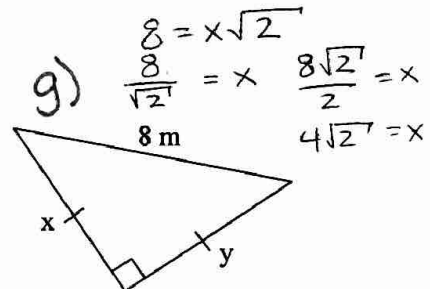
$$\begin{aligned} 11 \sin 78 &= x \\ 10.76 \text{ m} &= x \end{aligned}$$



$$\cos x = \frac{3.4}{7.8}$$

$$\cos^{-1} \left( \frac{3.4}{7.8} \right) = x$$

$$64.2^\circ = x$$



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

$$\begin{aligned} 4\sqrt{2} \text{ m} &= x \\ 4\sqrt{2} \text{ m} &= y \end{aligned}$$

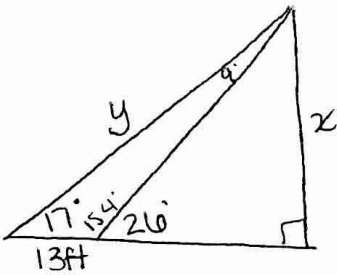
Applications

1. I'm trying to measure the height of a flag pole. From a spot on the ground, the angle of elevation to the top of the flag pole is  $17^\circ$ . After I walk 13 feet closer, the angle of elevation is now  $26^\circ$ . How tall is the flag pole?

2. Ms. Taylor is 5 feet tall and is standing 675 feet away from the Statue of Liberty. If she can see the top of the statue at an angle of  $37^\circ$  to the horizon, how tall is the statue?

3. Two dogs, Izzy and Rocky, are at my house and start running in straight lines at an angle of  $145^\circ$  to each other. If Izzy runs 40 mph and Rocky runs 45 mph, how far apart are they after 12 minutes?

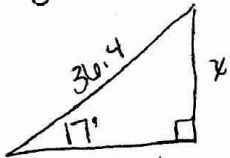
1.



$$\frac{\sin 9}{13} = \frac{\sin 154}{y}$$

$$y = \frac{13 \sin 154}{\sin 9}$$

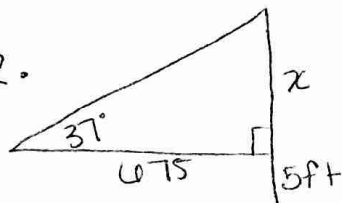
$$y = 36.4 \text{ ft}$$



$$\sin 17 = \frac{x}{36.4}$$

$$x = 10.6 \text{ ft}$$

2.



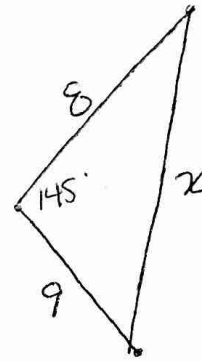
$$\tan 37 = \frac{x}{675}$$

$$675 \tan 37 = x$$

$$508.6 = x$$

$$513.6 \text{ ft}$$

3.



$$x^2 = 8^2 + 9^2 - 2(8)(9)\cos 145$$

$$x^2 = 262.96$$

$$x = 16.22 \text{ miles}$$