

Geometry: Chapter 7 Review
Practice Test

Name:

Determine whether $\triangle DEF$ is a right triangle for the given vertices. Explain.

1. $D(0, 1), E(3, 2), F(2, 3)$

$$DE = \sqrt{(3-0)^2 + (2-1)^2} = \sqrt{9+1} = \sqrt{10}$$

$$EF = \sqrt{(3-2)^2 + (2-3)^2} = \sqrt{1+1} = \sqrt{2}$$

$$DF = \sqrt{(2-0)^2 + (3-1)^2} = \sqrt{4+4} = \sqrt{8}$$

$$\sqrt{2}^2 + \sqrt{8}^2 = \sqrt{10}^2 \quad 10 = 10 \quad \text{Yes}$$

2. $D(-2, 2), E(3, -1), F(-4, -3)$

$$DE = \sqrt{(3-(-2))^2 + (-1-2)^2} = \sqrt{25+9} = \sqrt{34}$$

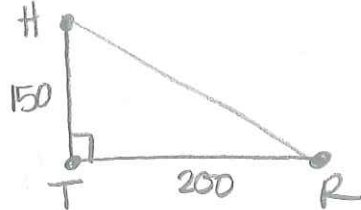
$$EF = \sqrt{(3-(-4))^2 + (-1-(-3))^2} = \sqrt{49+4} = \sqrt{53}$$

$$DF = \sqrt{(-4-(-2))^2 + (-3-2)^2} = \sqrt{4+25} = \sqrt{29}$$

$$\sqrt{29}^2 + \sqrt{34}^2 = \sqrt{53}^2 \quad 29+34 \neq 53$$

NO

3. Richmond is 200 kilometers due east of Teratown and Hamilton is 150 kilometers directly north of Teratown. Find the shortest distance in kilometers between Hamilton and Richmond. Round answer to the nearest tenth.

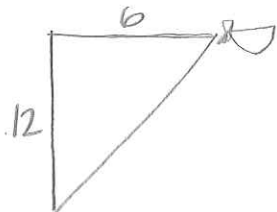


$$150^2 + 200^2 = x^2$$

$$62500 = x^2$$

$$250 \text{ km} = x$$

4. A fishing trawler off the coast of Alaska was ordered by the U.S. Coast Guard to change course. They were to travel 6 miles west and then sail 12 miles south to miss a large iceberg before continuing on the original course. How many miles out of the way did the trawler travel? Round answer to the nearest tenth.



$$6^2 + 12^2 = x^2$$

$$13.4 \approx x$$

$$6+12 = 18$$

$$18 - 13.4 = 4.6 \text{ mi}$$

Determine whether each set of measures are the sides of a right triangle. Then state whether they form a Pythagorean triple.

5. $\frac{\sqrt{6}}{3}, \frac{\sqrt{10}}{5}, \frac{\sqrt{240}}{15}$

$$\left(\frac{\sqrt{6}}{3}\right)^2 + \left(\frac{\sqrt{10}}{5}\right)^2 = \left(\frac{\sqrt{240}}{15}\right)^2 \quad \text{Yes, No}$$

$$\frac{6}{9} + \frac{10}{25} = \frac{240}{225} \quad \frac{16}{15} = \frac{16}{15}$$

6. 8, 15, 17

$$8^2 + 15^2 = 17^2$$

$$64 + 225 = 289$$

$$289 = 289$$

Yes, Yes

7. 6, $\sqrt{13}$, 49

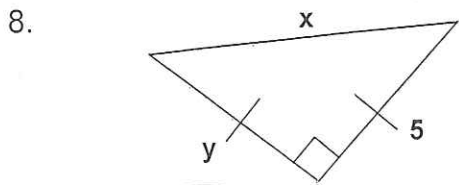
$$6^2 + \sqrt{13}^2 = 49^2$$

$$36 + 13 = 2401$$

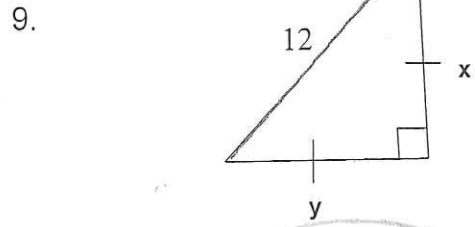
$$49 \neq 2401$$

NO, NO

Find x and y. Leave as EXACT answers.

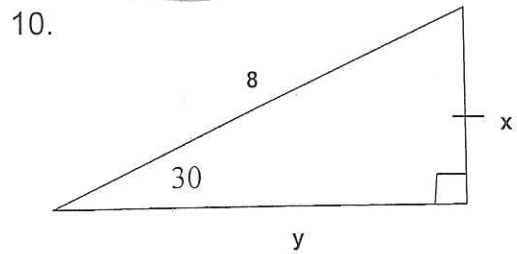


$x = 5\sqrt{2}$
 $y = 5$

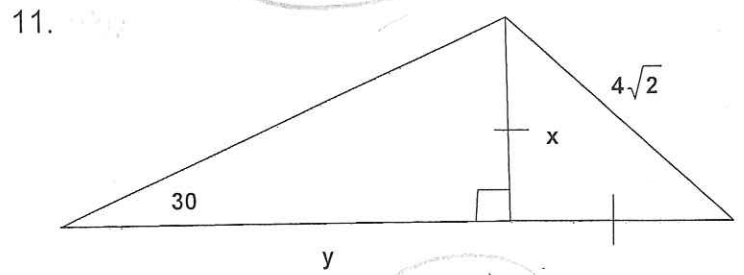


$\frac{12}{\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}}$
 $\frac{12\sqrt{2}}{2} = 6\sqrt{2}$

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

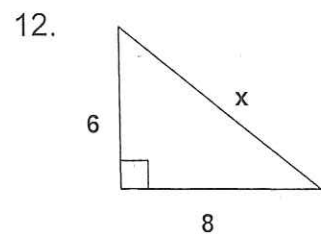


$x = 4$ $y = 4\sqrt{3}$



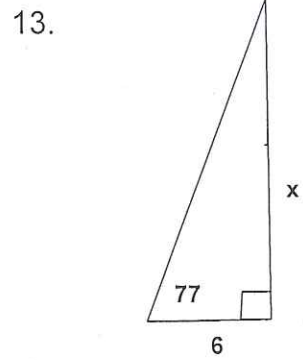
$x = 4$
 $y = 4\sqrt{3}$

Find x. Round answers to the nearest tenth.



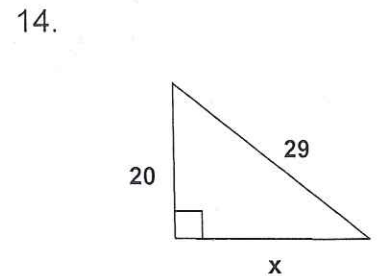
$6^2 + 8^2 = x^2$

$x = 10$



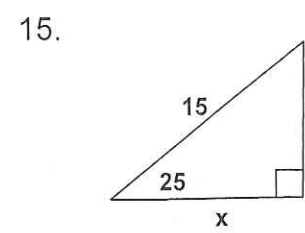
$\tan 77 = \frac{x}{6}$
 $6 \tan 77 = x$

$26.0 \approx x$



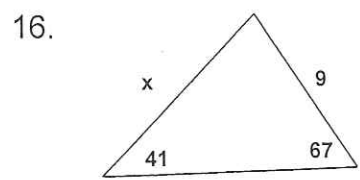
$20^2 + x^2 = 29^2$

$x = 21$



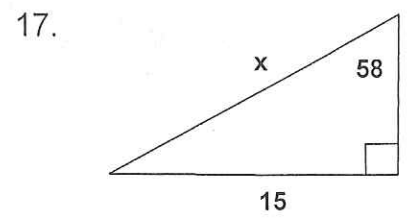
$\cos 25 = \frac{x}{15}$
 $15 \cos 25 = x$

$13.0 \approx x$



$\frac{\sin 67}{x} = \frac{\sin 41}{9}$
 $x \sin 41 = 9 \sin 67$
 $\frac{x \sin 41}{\sin 41} = \frac{9 \sin 67}{\sin 41}$

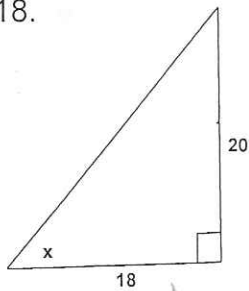
$x \approx 12.6$



$\sin 58 = \frac{15}{x}$
 $x \sin 58 = 15$
 $\frac{x \sin 58}{\sin 58} = \frac{15}{\sin 58}$

$x = 17.7$

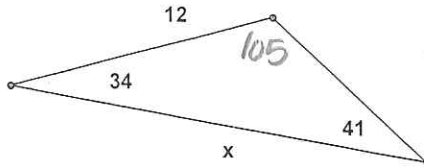
18.



$$\tan x = \frac{20}{18}$$

$$x \approx 48.0^\circ$$

19.

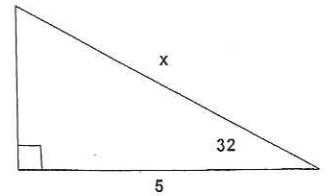


$$\frac{\sin 105}{x} = \frac{\sin 41}{12}$$

$$x \sin 41 = 12 \sin 105$$

$$x \approx 17.7$$

20.

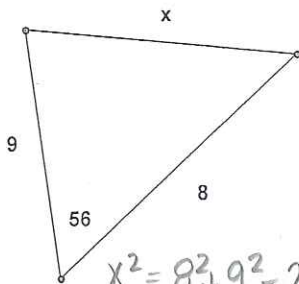


$$\cos 32 = \frac{5}{x}$$

$$x \cos 32 = 5$$

$$x \approx 5.9$$

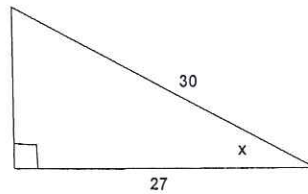
21.



$$x^2 = 8^2 + 9^2 - 2(8)(9)\cos 56$$

$$x \approx 8.0$$

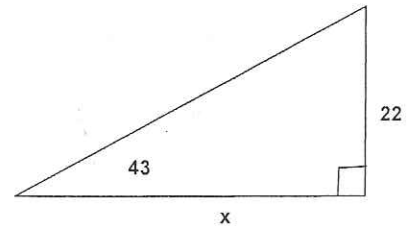
22.



$$\cos x = \frac{27}{30}$$

$$x \approx 25.8^\circ$$

23.



$$\tan 43 = \frac{22}{x}$$

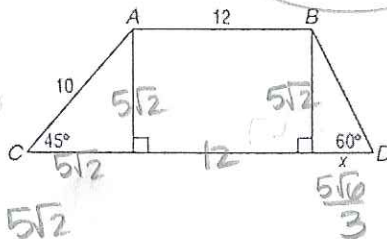
$$x \tan 43 = 22$$

$$x \approx 23.0$$

24. If $\overline{AB} \parallel \overline{CD}$, find x and the length of \overline{CD} . Round answer to the nearest tenth.

$$\frac{10}{\sqrt{2}} = \frac{\sqrt{2}}{\sqrt{2}}$$

$$\frac{10\sqrt{2}}{2} = 5\sqrt{2}$$

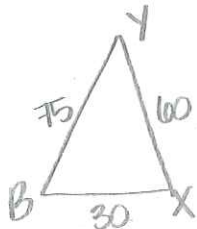


$$\frac{5\sqrt{2}}{\sqrt{3}} = \frac{\sqrt{3}}{\sqrt{3}}$$

$$\frac{5\sqrt{6}}{3}$$

$$5\sqrt{2} + 12 + \frac{5\sqrt{6}}{3} \approx 23.2$$

25. Solve $\triangle BXY$, if $x = 75$, $b = 60$, and $y = 30$.



$$\frac{\sin 108.2}{75} = \frac{\sin y}{30}$$

$$22.3^\circ = m\angle Y$$

$$75^2 = 30^2 + 60^2 - 2(30)(60)\cos X$$

$$108.2^\circ = m\angle X$$

$$m\angle Z = 49.5^\circ$$

26. Solve $\triangle NOP$, if $o = 1.7$, $n = 3.5$, $m\angle N = 80^\circ$.



$$\frac{\sin 80}{3.5} = \frac{\sin O}{1.7}$$

$$m\angle O = 28.0^\circ$$

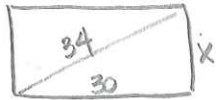
$$m\angle P = 71.4^\circ$$

$$\frac{\sin 80}{3.5} = \frac{\sin 71.4}{p}$$

$$p \approx 3.4$$

Sketch a picture to help you solve the following story problems. You may want to use a separate sheet of paper. Round answers to the nearest tenth.

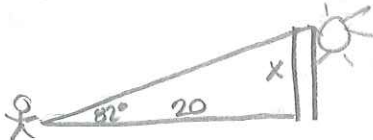
27. The screen at a local movie theatre has a diagonal of 34 feet. If the width of the screen is 30 feet, how tall is the screen?



$$x^2 + 30^2 = 34^2$$

$$x = 16 \text{ ft}$$

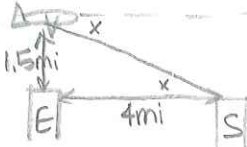
28. Standing outside, a person measures the angle of incline to the sun at 82 degrees. If a building creates a shadow twenty feet long, how tall is the building?



$$\tan 82 = \frac{x}{20}$$

$$42.3 \text{ ft}$$

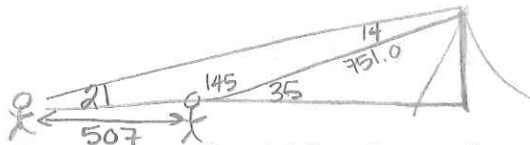
29. A pilot is flying 1.5 miles directly above the Empire State Building. The pilot can see the Statue of Liberty below and knows that the distance between the Empire State Building and the Statue of Liberty is 4 miles. What is the pilot's angle of depression to the Statue?



$$\tan x = \frac{1.5}{4}$$

$$20.0^\circ$$

30. A crew is given the job of measuring the height of a mountain. From a point on level ground, they measure an angle of elevation to the top of 21 degrees. They move 507 meters closer and the angle is now 35 degrees. How high is the mountain?



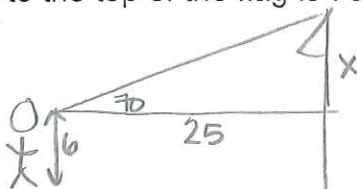
$$\frac{\sin 14}{507} = \frac{\sin 21}{x}$$

$$x \approx 751.0$$

$$\sin 35 = \frac{h}{751.0}$$

$$430.8 \text{ m}$$

31. Tom is 6 feet tall and is standing 25 feet from a flagpole. Tom calculates that the angle of elevation to the top of the flag is 70 degrees. Accounting for Tom's height, how tall is the flagpole?



$$\tan 70 = \frac{x}{25}$$

$$68.7 = x$$

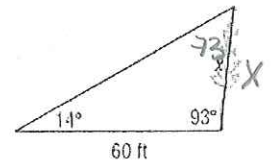
$$68.7 + 6 = 74.7 \text{ ft}$$

32. A tree grew at a 3° slant from the vertical. At a point 60 feet from the tree, the angle of elevation to the top of the tree is 14°. Find the length of the tree to the nearest tenth of a foot.

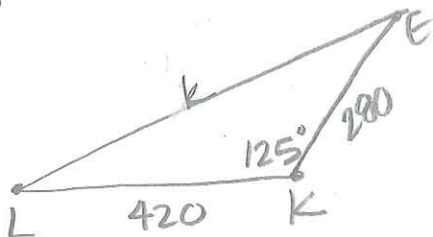
$$\frac{\sin 14}{x} = \frac{\sin 73}{60}$$

$$60 \sin 14 = x \sin 73$$

$$15.2 \text{ ft}$$



33. To approximate the length of a pond, a surveyor walks 420 meters from point L to point K, then turns and walks 280 meters from point K to point E. If $m\angle LKE = 125^\circ$, find the length of LE of the pond to the nearest tenth of a meter.



$$x^2 = 420^2 + 280^2 - 2(420)(280)\cos 125$$

$$624.3 \text{ m}$$