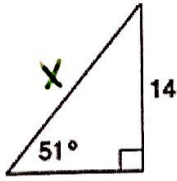


Name \_\_\_\_\_

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### Unit 3 Test REVIEW Right Triangle Trigonometry

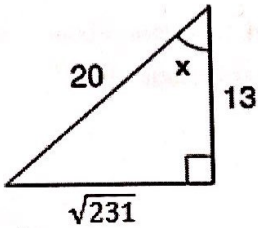
1. Solve for  $x$ . Round to the nearest tenth.



$$\sin 51^\circ = \frac{14}{x}$$

**18.0**

2. Find the measure of angle  $x$ . Round your answer to the nearest degree.

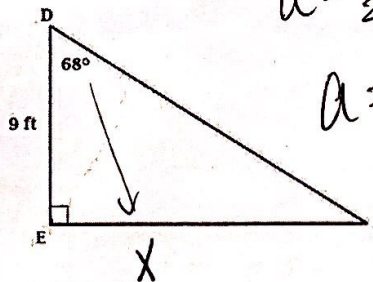


**49°**

3. Triangle  $DEF$  is a right triangle with right angle  $E$ , as shown. What is the area of triangle  $DEF$ ? Round to the hundredths place.

$$\tan 68^\circ = \frac{x}{9}$$

$$x = 22.28$$



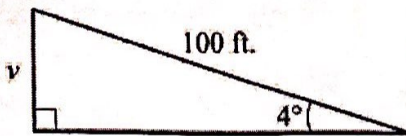
$$a = \frac{1}{2} b \cdot h$$

$$a = \frac{1}{2} (22.28)(9)$$

**$a = 100.26 \text{ ft}^2$**

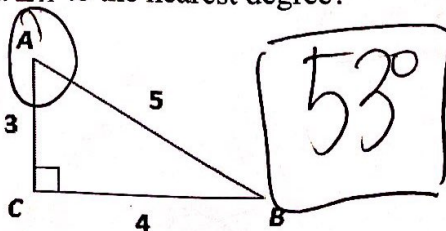
4. A road ascends a hill at an angle of  $4^\circ$ . For every 100 feet of road, how many feet,  $v$ , does the road ascend? Round your answer to the nearest foot.

**7**



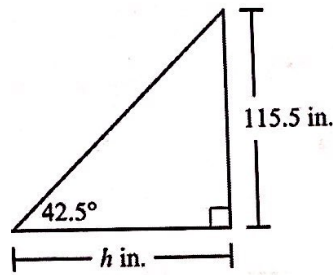
$$\sin 4^\circ = \frac{v}{100}$$

5. Given triangle  $ABC$ , what is  $m\angle A$  to the nearest degree?



**53°**

According to building codes, the maximum angle of ascent for a staircase in a home is  $42.5^\circ$ . To get from the first floor to the second floor in a new home, a staircase will have a total vertical distance of 115.5 inches. What is the minimum horizontal distance  $h$ , to the nearest inch, needed for the staircase?

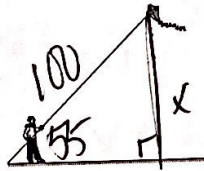


$$\tan 42.5^\circ = \frac{115.5}{h}$$

(.916)

$$h = 126 \text{ in}$$

7. A kite string is 100 feet long from the kite to the ground. The string makes a  $55^\circ$  angle with the ground. To the nearest foot, how high off the ground is the kite?



$$\sin 55^\circ = \frac{x}{100}$$

.819

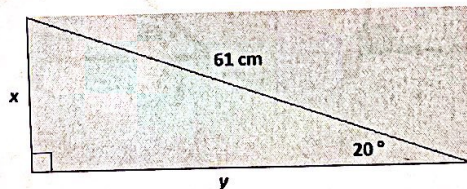
$$82 \text{ ft}$$

8. In  $\triangle RST$ ,  $m\angle R + m\angle T = 90^\circ$  and  $\sin R = \frac{\sqrt{3}}{2}$ . What other trig ratio is equal to  $\frac{\sqrt{3}}{2}$ ?

$$\cos T = \frac{\sqrt{3}}{2}$$

9. In  $\triangle ABC$ ,  $\angle A$  and  $\angle B$  are complementary angles.  $\sin(A) = \cos(B)$

10. Find  $x$  and  $y$ . Round to the nearest whole number.



$$\sin 20^\circ = \frac{x}{61}$$

(.342)

$$x = 21 \text{ cm}$$

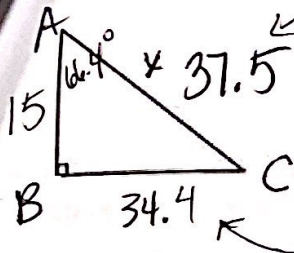
$$\cos 20^\circ = \frac{y}{61}$$

(.940)

$$y = 57$$

In right triangle ABC,  $\angle B = 90^\circ$ ,  $\cos A = \frac{2}{5}$  and  $\overline{AB} = 15$ . What is the perimeter of triangle ABC?

Round to the tenths place.



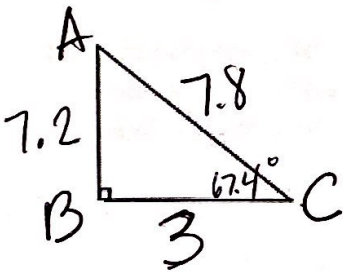
$$\cos A = \frac{2}{5} = \frac{15}{x} \quad x = 37.5$$

$$P = 86.9$$

$$x^2 + 15^2 = 37.5^2$$

$$x = 34.4$$

12. In right triangle ABC,  $\angle B = 90^\circ$ ,  $\tan C = \frac{12}{5}$  and  $\overline{BC} = 3$ . What is the perimeter of triangle ABC?



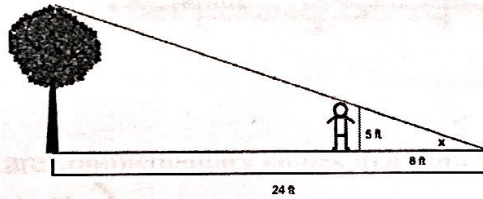
$$\tan C = \frac{12}{5} = \frac{x}{3} \quad x = 7.2$$

$$P = 18$$

$$3^2 + 7.2^2 = x^2$$

$$x = 7.8$$

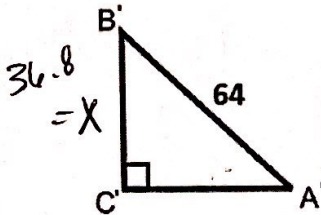
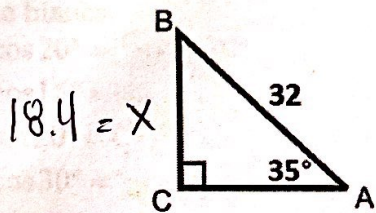
13. Find the value of  $x$ .



$$\tan x^\circ = \frac{5}{8}$$

$$x^\circ = 32^\circ$$

14. Triangle ABC is similar to triangle A'B'C'. To the nearest tenth, what is the length of  $\overline{B'C'}$ ?



$$\sin 35^\circ = \frac{x}{32}$$

(.574)

$$x = 18.4$$

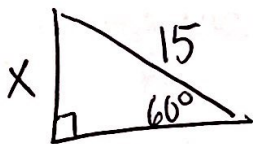
$$18.4 \times 2 = 36.8$$

## No Calculator #16-30

5. In a right triangle,  $A$  and  $B$  are acute angles. If  $\sin B = \frac{12}{13}$ , what is  $\cos A$ ?

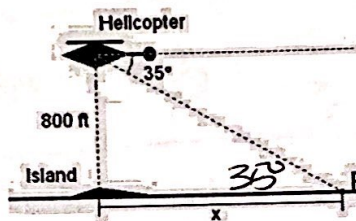
$$\frac{12}{13}$$

16. A 15-foot ladder is leaning against a building at a  $60^\circ$  angle with the ground. Set up a trig ratio which can be used to find how high the ladder reaches up the side of the building. (Do not solve.)



$$\sin 60^\circ = \frac{x}{15}$$

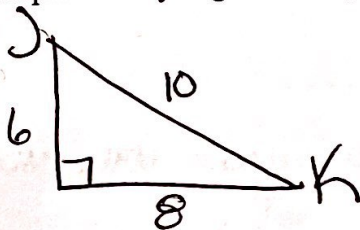
17. A helicopter is 800 feet above the island. The angle of depression from the helicopter to a point  $P$  in the water is  $35^\circ$ . Write an equation that can be used to find the distance from the island to the point in the water. (Do not solve.)



$$\tan 35^\circ = \frac{800}{x}$$

18. Angle  $J$  and angle  $K$  are complementary angles in a right triangle. The value of  $\tan J$  is  $\frac{8}{6}$ . What is the value of  $\sin J$ ?

$$\sin J = \frac{8}{10}$$

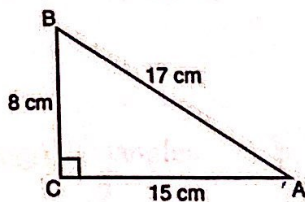


$$\begin{aligned} 6^2 + 8^2 &= x^2 \\ 36 + 64 &= x^2 \\ 100 &= x^2 \\ 10 &= x \end{aligned}$$

19. Fill in the blanks.

- $\cos 20^\circ = \sin 70^\circ$
- $\cos 15^\circ = \sin 75^\circ$
- $\sin 20^\circ = \cos 70^\circ$
- $\cos 30^\circ = \sin 60^\circ$

21. Complete each trig ratio.



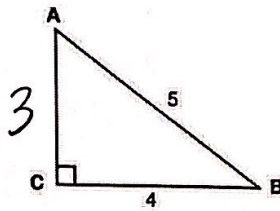
a.  $\sin A = \frac{8}{17}$

b.  $\tan A = \frac{8}{15}$

c.  $\cos A = \frac{15}{17}$

d.  $\tan B = \frac{15}{8}$

Complete each trig ratio.



$$x^2 + 4^2 = 5^2$$

$$x^2 + 16 = 25$$

$$x^2 = 9$$

$$x = 3$$

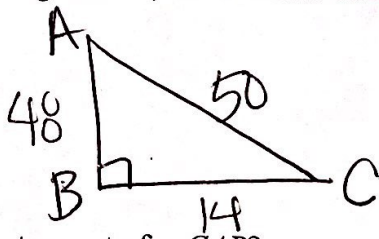
a.  $\sin A = \frac{4}{5}$

b.  $\tan A = \frac{4}{3}$

c.  $\cos B = \frac{4}{5}$

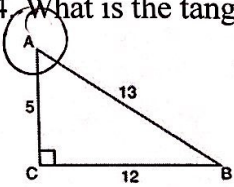
d.  $\tan B = \frac{3}{4}$

23. In triangle ABC, the measure of  $\angle B = 90^\circ$ ,  $AC = 50$ ,  $AB = 48$ , and  $BC = 14$ . What is the sine of angle A?



$$\sin A = \frac{14}{50}$$

24. What is the tangent of  $\angle CAB$ ?



$$\tan \angle CAB = \frac{12}{5}$$

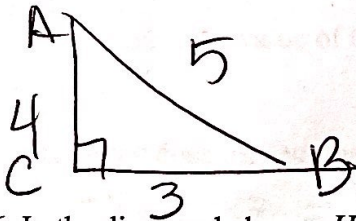
25. In triangle ABC,  $m\angle C = 90^\circ$ . If  $AB = 5$  and  $AC = 4$ , complete each trig ratio.

a.  $\cos A = \frac{4}{5}$

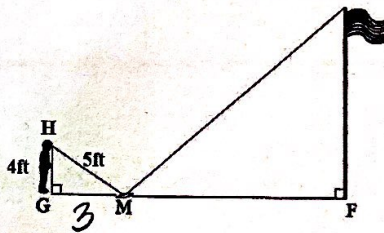
b.  $\tan A = \frac{3}{4}$

c.  $\sin B = \frac{4}{5}$

d.  $\tan B = \frac{4}{3}$



26. In the diagram below,  $\triangle HGM \sim \triangle JFM$ . What is the tangent of  $\angle J$ ?



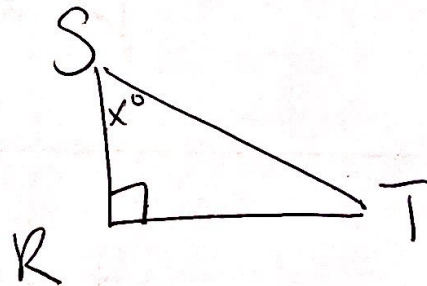
$$\tan J = \tan H = \frac{3}{4}$$

27. In  $\triangle RST$ ,  $\angle R = 90^\circ$  and  $\angle S = x^\circ$ . Fill in the blanks.

a.  $\angle S + \angle T = 90^\circ$

b.  $\angle T = 90^\circ - x^\circ$

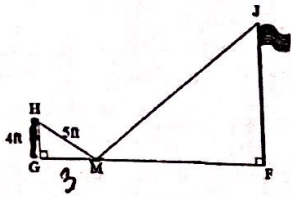
c. Angles S and T are complementary angles



28. If  $\sin x = \frac{1}{2}$  then  $\cos(90 - x) = ?$   $\frac{1}{2}$

If  $\cos x^\circ = \frac{a}{b}$  and  $\sin y^\circ = \frac{a}{b}$  then  $x^\circ + y^\circ = 90$

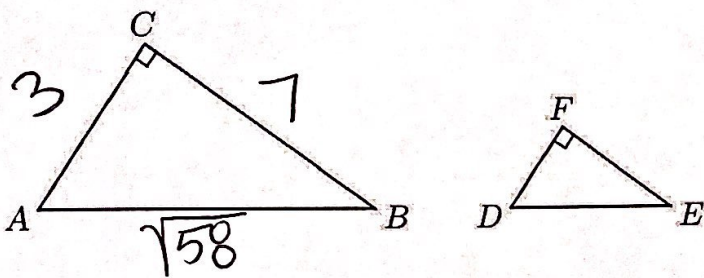
30. In the diagram below,  $\triangle HGM \sim \triangle JFM$ . The sine of  $\angle J = ?$



$$\sin J = \sin H = \frac{3}{5}$$

**Constructed Response**

31. As shown below,  $\triangle ABC \sim \triangle DEF$ ,  $\tan A = \frac{7}{3}$ , and  $\cos B = \frac{7}{\sqrt{58}}$ .



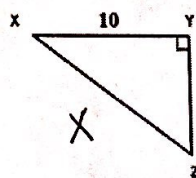
A. Find  $\sin B$ .  $\frac{3}{\sqrt{58}}$

B. What is the value of the tangent of  $E$ ?  $\frac{3}{7}$

C. How does the fact that  $\triangle DEF$  is similar to  $\triangle ABC$  help you find  $\tan E$ ?

$\tan E = \tan B = \frac{3}{7}$

32. In right triangle XYZ below,  $\cos X = \frac{1}{3}$ .



$$\cos X = \frac{1}{3} = \frac{10}{x}$$

A. What is the length of  $\overline{XZ}$ ? 30

B. Explain how you found your answer to part A.

I set up a proportion using the adjacent side of x and the hypotenuse.