

I. State each trigonometric ratio using words, hypotenuse, adjacent leg, opposite leg:

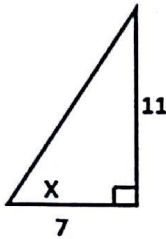
1.  $\sin A = \frac{\text{opposite}}{\text{hypotenuse}}$     2.  $\cos A = \frac{\text{adjacent}}{\text{hypotenuse}}$     3.  $\tan A = \frac{\text{opposite}}{\text{adjacent}}$

II. Explain when to use the inverse trig functions  $\sin^{-1}$ ,  $\cos^{-1}$ ,  $\tan^{-1}$ :

When solving for an ~~unknown~~ angle

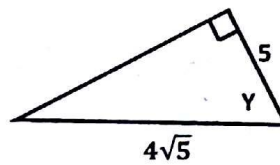
III. Determine each missing angle. Round your answer to the nearest tenth.

1.  $X = \underline{57.5^\circ}$



$\tan(x) = \frac{11}{7}$   
 $x = \tan^{-1}(\frac{11}{7})$

2.  $Y = \underline{56.0^\circ}$



$\cos(Y) = \frac{5}{4\sqrt{5}}$   
 $Y = \cos^{-1}(\frac{5}{4\sqrt{5}})$

IV. Use the figure at the right to express the ratio as a fraction in lowest terms.

1.  $\sin A = \underline{\frac{5}{13}}$

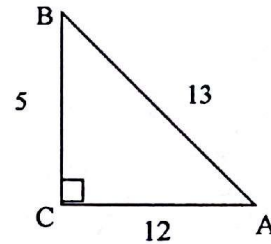
4.  $\cos B = \underline{\frac{5}{13}}$

2.  $\cos A = \underline{\frac{12}{13}}$

5.  $\tan A = \underline{\frac{5}{12}}$

3.  $\sin B = \underline{\frac{12}{13}}$

6.  $\tan B = \underline{\frac{12}{5}}$



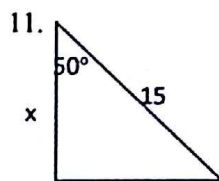
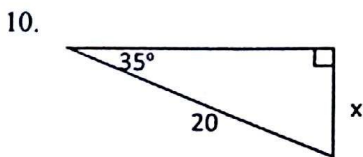
Use a calculator to compute the following. Round side lengths to the nearest thousandths and angles to the nearest degree.

7.  $\sin 27^\circ = \underline{.454}$

8.  $\tan 78^\circ = \underline{4.705}$

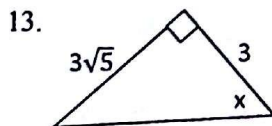
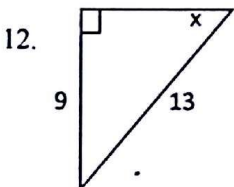
9.  $\cos 8^\circ = \underline{.990}$

Find the missing parts for each triangle by using the correct trig ratio. When finding the side length round the decimal to the nearest tenth and angles to the nearest degree.



10.  $x = \underline{11.577}$

11.  $x = \underline{9.6}$



12.  $x = \underline{44^\circ}$

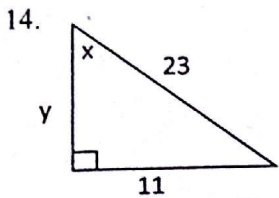
13.  $x = \underline{66^\circ}$

10.  $\sin(35^\circ) = \frac{x}{20}$   
 $x = 20 \sin 35^\circ$

11.  $\cos(50^\circ) = \frac{x}{15}$   
 $x = 15 \cos(50^\circ)$

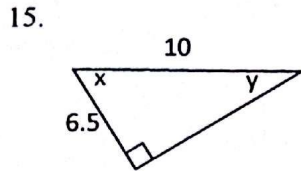
12.  $\sin(x) = \frac{9}{13}$   
 $x = \sin^{-1}(\frac{9}{13})$

13.  $\tan(x) = \frac{3\sqrt{5}}{3}$   
 $x = \tan^{-1}(\sqrt{5})$



$$\sin(x) = \frac{11}{23}$$

$$x = \sin^{-1}\left(\frac{11}{23}\right)$$



$$y^2 + 11^2 = 23^2$$

$$y^2 = 408$$

$$y = 20.2$$

14.  $x = 29^\circ$   $y = 20.2$

15.  $x = 49.5^\circ$   $y = 40.5$

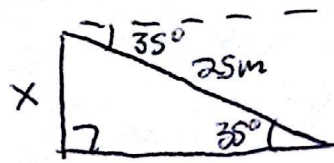
$$\cos(x) = \frac{6.5}{10}$$

$$x = \cos^{-1}\left(\frac{6.5}{10}\right)$$

$$x = 49.5$$

180
- 49.5
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130.5
- 90
-----
40.5

16. A bird sits on top of a lamppost. The angle of depression from the bird to the feet of an observer standing away from the lamppost is  $35^\circ$ . The distance from the bird to the observer is 25 meters. How tall is the lamppost?

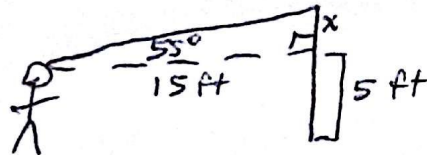


$$\sin(35^\circ) = \frac{x}{25}$$

$$x = 25 \sin(35^\circ)$$

$$x = 14.3 \text{ m}$$

17. Holly stands 15 ft from a statue. She looks up at an angle of  $55^\circ$  to see the top of the statue. Her eye level is 5 ft above the ground. How tall is the statue to the nearest foot?

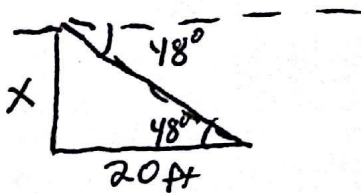


$$\tan(55^\circ) = \frac{x}{15}$$

$$x = 15 \tan(55^\circ)$$

$$x = 21.4 \text{ ft}$$

18. Emily and Sarah are at a football game and are in the balcony. They are looking down at the field at an angle of  $48^\circ$ . The bottom of the balcony (directly beneath them) is 20 feet away from the end zone. How high up is the balcony?

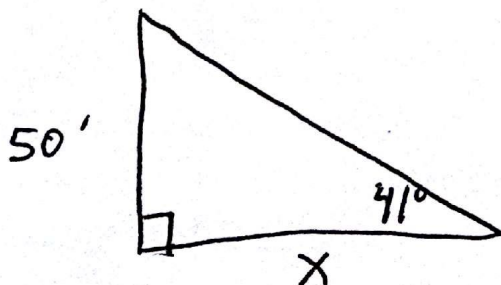


$$\tan(48^\circ) = \frac{x}{20}$$

$$x = 20 \tan(48^\circ)$$

$$x = 22.2 \text{ ft}$$

19. A building is 50 feet high. At a distance away from the building, an observer notices that the angle of elevation to the top of the building is  $41^\circ$ . How far is the observer from the base of the building?



$$\tan(41^\circ) = \frac{50}{x}$$

$$x = \frac{50}{\tan(41^\circ)}$$

$$x = 57.6'$$