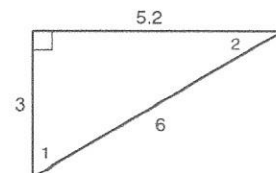


Sine and Cosine Ratios

Practice and Problem Solving: A/B

1. $\sin \angle 1 = \frac{5.2}{6} \approx$

2. $\sin \angle 2 = \frac{3}{6} = \frac{1}{2}$



3. $\cos \angle 1 = \frac{3}{6} = \frac{1}{2}$

4. $\cos \angle 2 = \frac{5.2}{6} \approx$

Find each length. Round to the nearest tenth.

5. $\sin 62 = \frac{11}{x}$
 $x \sin 62 = 11$
 $x = \frac{11}{\sin 62}$
 $BD = 11.5$

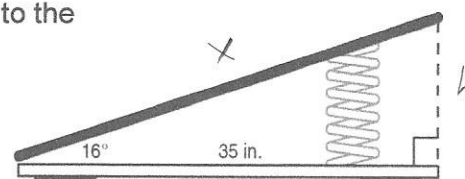
6. $\cos 38 = \frac{x}{25}$
 $25 \cos 38 = x$
 $QP = 19.7$

7. $\cos 27 = \frac{5}{x}$
 $x \cos 27 = 5$
 $x = \frac{5}{\cos 27}$
 $ST = 5.6$

8. Find the perimeter of the triangle. $\sin 18 = \frac{x}{4.2}$ $\cos 18 = \frac{y}{4.2}$
 $P = 1.2 + 3.8 + 4.2$ $4.2 \sin 18 = x$ $4.2 \cos 18 = y$
 $= 9.2$ $x = 1.2$ $y = 3.8$

9. What is the length of the hypotenuse of the springboard shown to the right?

$\cos 16 = \frac{35}{x}$
 $x \cos 16 = 35$
 $x = \frac{35}{\cos 16}$
 $x = 36.4$



10. What is the height of the springboard (the dotted line)?

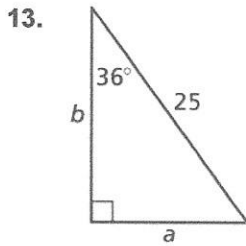
$\tan 16 = \frac{h}{35}$
 $35 \tan 16 = h$
 $h = 10.0$

Find $\sin J$, $\sin K$, $\cos J$, and $\cos K$. Write each answer as a fraction.

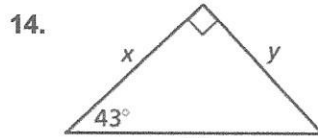
11. $\sin J = \frac{12}{13}$ $\sin K = \frac{5}{13}$
 $\cos J = \frac{5}{13}$ $\cos K = \frac{12}{13}$

12. $\sin J = \frac{30}{34} = \frac{15}{17}$
 $\cos J = \frac{16}{34} = \frac{8}{17}$
 $\sin K = \frac{16}{34} = \frac{8}{17}$
 $\cos K = \frac{30}{34} = \frac{15}{17}$

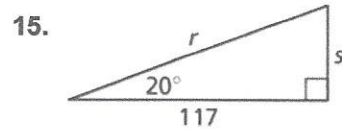
In Exercises 13–18, find the value of each variable. Round your answers to the nearest tenth.



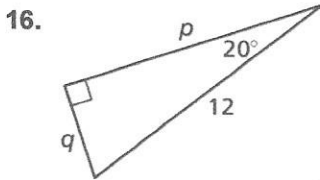
$$\begin{aligned} \sin 36 &= \frac{a}{25} \\ 25 \sin 36 &= a \\ a &= 14.7 \\ \cos 36 &= \frac{b}{25} \\ 25 \cos 36 &= b \\ b &= 20.2 \end{aligned}$$



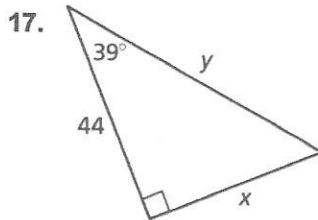
$$\begin{aligned} \cos 43 &= \frac{x}{25} \\ 25 \cos 43 &= x \\ x &= 18.3 \\ \sin 43 &= \frac{y}{25} \\ 25 \sin 43 &= y \\ y &= 17.0 \end{aligned}$$



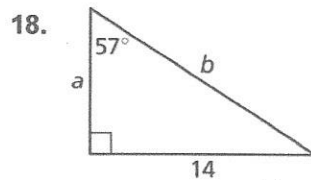
$$\begin{aligned} \tan 20 &= \frac{s}{117} \\ 117 \tan 20 &= s \\ s &= 42.6 \\ \cos 20 &= \frac{117}{r} \\ r \cos 20 &= 117 \\ r &= \frac{117}{\cos 20} = 124.5 \end{aligned}$$



$$\begin{aligned} \sin 20 &= \frac{q}{12} & \cos 20 &= \frac{p}{12} \\ 12 \sin 20 &= q & 12 \cos 20 &= p \\ q &= 4.1 & p &= 11.3 \end{aligned}$$

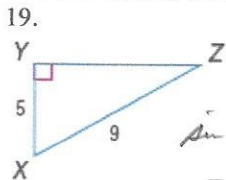


$$\begin{aligned} \tan 39 &= \frac{x}{44} & \cos 39 &= \frac{44}{y} \\ 44 \tan 39 &= x & y \cos 39 &= 44 \\ x &= 35.6 & y &= \frac{44}{\cos 39} = 56.6 \end{aligned}$$

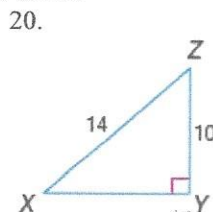


$$\begin{aligned} \sin 57 &= \frac{14}{b} & \tan 57 &= \frac{14}{a} \\ b \sin 57 &= 14 & a \tan 57 &= 14 \\ b &= \frac{14}{\sin 57} = 16.7 & a &= \frac{14}{\tan 57} = 9.1 \end{aligned}$$

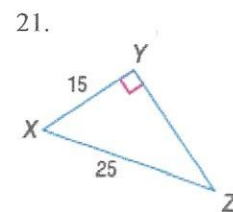
Find the measure of $\angle Z$ to the nearest tenth.



$$\begin{aligned} \sin Z &= \frac{5}{9} \\ Z &= 33.7 \end{aligned}$$

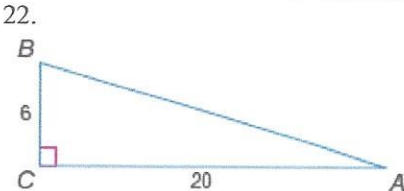


$$\begin{aligned} \cos Z &= \frac{10}{14} \\ Z &= 44.4 \end{aligned}$$

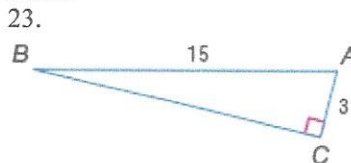


$$\begin{aligned} \sin Z &= \frac{15}{25} \\ Z &= 36.9 \end{aligned}$$

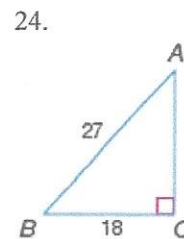
Find the measure of $\angle A$ to the nearest tenth.



$$\begin{aligned} \tan A &= \frac{6}{20} \\ A &= 16.7 \end{aligned}$$



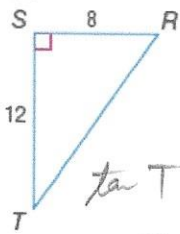
$$\begin{aligned} \cos A &= \frac{3}{15} \\ A &= 78.5 \end{aligned}$$



$$\begin{aligned} \sin A &= \frac{18}{27} \\ A &= 41.8 \end{aligned}$$

Find the measure of $\angle T$ to the nearest tenth.

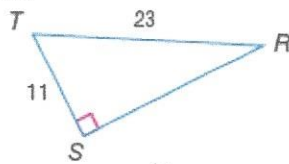
25.



$$\tan T = \frac{8}{12}$$

$$T = 33.7$$

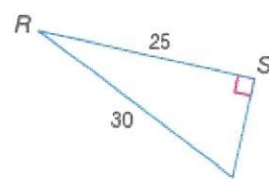
26.



$$\cos T = \frac{11}{23}$$

$$T = 61.4$$

27.

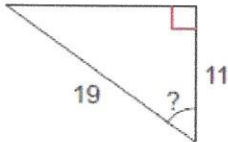


$$\sin T = \frac{25}{30}$$

$$T = 56.4$$

Find the measure of the indicated angle to the nearest degree.

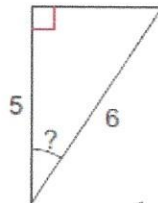
28.



$$\cos x = \frac{11}{19}$$

$$x = 54.6$$

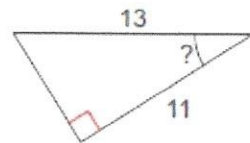
29.



$$\cos x = \frac{5}{6}$$

$$x = 33.6$$

30.

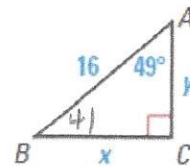


$$\cos x = \frac{11}{13}$$

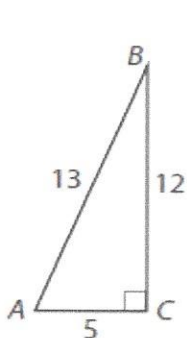
$$x = 32.2$$

31. Nick uses the equation $\sin 49^\circ = \frac{x}{16}$ to find BC in $\triangle ABC$. Tim uses the equation $\cos 41^\circ = \frac{x}{16}$. Which equation produces the correct answer? Explain.

Both are correct.
 At 49° , opp. = x and hyp. = 16
 At 41° , adj. = x and hyp. = 16



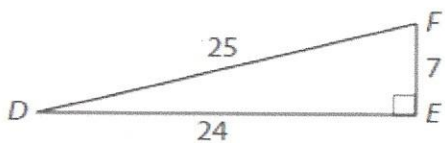
Find the following. Write your answers as fractions.



3. $\sin A = \frac{12}{13}$

4. $\cos A = \frac{5}{13}$

5. $\cos B = \frac{12}{13}$



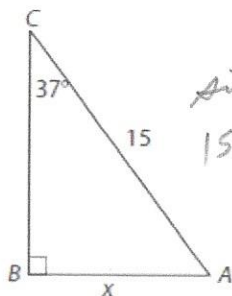
6. $\sin D = \frac{7}{25}$

7. $\cos F = \frac{7}{25}$

8. $\sin F = \frac{24}{25}$

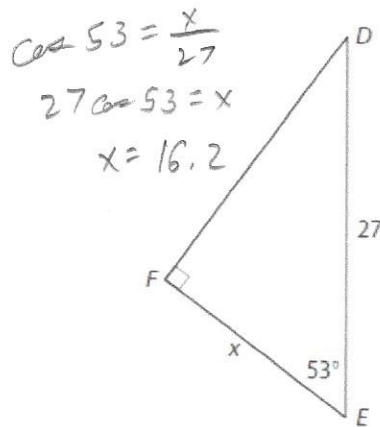
Find the unknown length x in each right triangle, to the nearest tenth.

9.



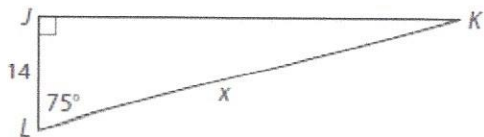
$\sin 37 = \frac{x}{15}$
 $15 \sin 37 = x$
 $x = 9.0$

10.



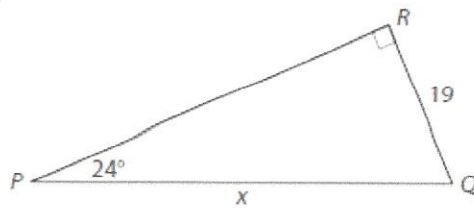
$\cos 53 = \frac{x}{27}$
 $27 \cos 53 = x$
 $x = 16.2$

11.



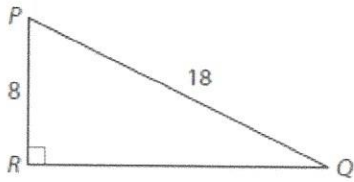
$\cos 75 = \frac{14}{x}$
 $x \cos 75 = 14$
 $x = \frac{14}{\cos 75} = 54.1$

12.

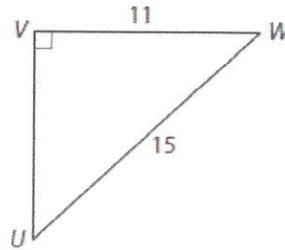


$\sin 24 = \frac{19}{x}$
 $x \sin 24 = 19$
 $x = \frac{19}{\sin 24} = 46.7$

Find each acute angle measure, to the nearest degree.



13. $m\angle P$ $\cos P = \frac{8}{18}$
 $P = 63.6$



14. $m\angle Q$ $\sin Q = \frac{8}{17}$
 $Q = 26.4$

15. $m\angle U$

$\sin U = \frac{11}{15}$
 $U = 47.2$

16. $m\angle W$

$\cos W = \frac{11}{15}$
 $W = 42.8$