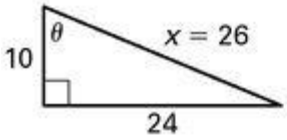
3.

$x = \sqrt{10^2 + 24^2} = 26$



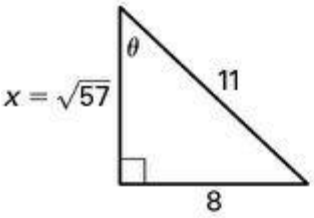
$$\sin\theta = \frac{\text{opp}}{\text{hyp}} = \frac{24}{26} = \frac{12}{13} \qquad \csc\theta = \frac{\text{hyp}}{\text{opp}} = \frac{26}{24} = \frac{13}{12}$$

$$\cos\theta = \frac{\text{adj}}{\text{hyp}} = \frac{10}{26} = \frac{5}{13} \qquad \sec\theta = \frac{\text{hyp}}{\text{adj}} = \frac{26}{10} = \frac{13}{5}$$

$$\tan\theta = \frac{\text{opp}}{\text{adj}} = \frac{24}{10} = \frac{12}{5} \qquad \cot\theta = \frac{\text{adj}}{\text{opp}} = \frac{10}{24} = \frac{5}{12}$$

5.

$x = \sqrt{11^2 - 8^2} = \sqrt{57}$



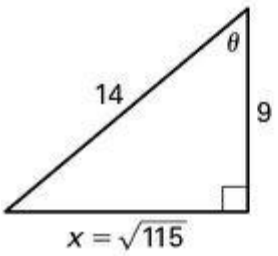
$$\sin\theta = \frac{\text{opp}}{\text{hyp}} = \frac{8}{11} \qquad \csc\theta = \frac{\text{hyp}}{\text{opp}} = \frac{11}{8}$$

$$\cos\theta = \frac{\text{adj}}{\text{hyp}} = \frac{\sqrt{57}}{11} \qquad \sec\theta = \frac{\text{hyp}}{\text{adj}} = \frac{11}{\sqrt{57}} = \frac{11\sqrt{57}}{57}$$

$$\tan\theta = \frac{\text{opp}}{\text{adj}} = \frac{8}{\sqrt{57}} = \frac{8\sqrt{57}}{57} \qquad \cot\theta = \frac{\text{adj}}{\text{opp}} = \frac{\sqrt{57}}{8}$$

7.

$$x = \sqrt{14^2 - 9^2} = \sqrt{115}$$



$$\sin\theta = \frac{\text{opp}}{\text{hyp}} = \frac{\sqrt{115}}{14}$$

$$\cos\theta = \frac{\text{adj}}{\text{hyp}} = \frac{9}{14}$$

$$\tan\theta = \frac{\text{opp}}{\text{adj}} = \frac{\sqrt{115}}{9}$$

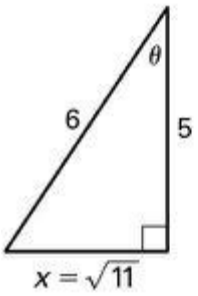
$$\csc\theta = \frac{\text{hyp}}{\text{opp}} = \frac{14}{\sqrt{115}} = \frac{14\sqrt{115}}{115}$$

$$\sec\theta = \frac{\text{hyp}}{\text{adj}} = \frac{14}{9}$$

$$\cot\theta = \frac{\text{adj}}{\text{opp}} = \frac{9}{\sqrt{115}} = \frac{9\sqrt{115}}{115}$$

9.

$x = \sqrt{6^2 - 5^2} = \sqrt{11}$



$\cos\theta = \dfrac{\text{adj}}{\text{hyp}} = \dfrac{\sqrt{11}}{6}$

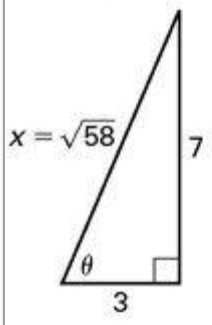
$\tan\theta = \dfrac{\text{opp}}{\text{adj}} = \dfrac{5}{\sqrt{11}} = \dfrac{5\sqrt{11}}{11}$

$\csc\theta = \dfrac{\text{hyp}}{\text{opp}} = \dfrac{6}{5}$

$\sec\theta = \dfrac{\text{hyp}}{\text{adj}} = \dfrac{6}{\sqrt{11}} = \dfrac{6\sqrt{11}}{11}$

$\cot\theta = \dfrac{\text{adj}}{\text{opp}} = \dfrac{\sqrt{11}}{5}$

11. $x = \sqrt{7^2 + 3^2} = \sqrt{58}$



$$\sin\theta = \frac{\text{opp}}{\text{hyp}} = \frac{7}{\sqrt{58}} = \frac{7\sqrt{58}}{58}$$

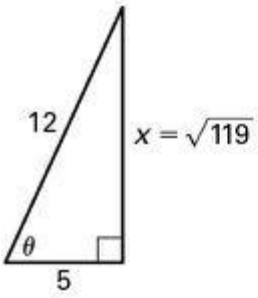
$$\cos\theta = \frac{\text{adj}}{\text{hyp}} = \frac{3}{\sqrt{58}} = \frac{3\sqrt{58}}{58}$$

$$\csc\theta = \frac{\text{hyp}}{\text{opp}} = \frac{\sqrt{58}}{7}$$

$$\sec\theta = \frac{\text{hyp}}{\text{adj}} = \frac{\sqrt{58}}{3}$$

$$\cot\theta = \frac{\text{adj}}{\text{opp}} = \frac{3}{7}$$

13. $x = \sqrt{12^2 - 5^2} = \sqrt{119}$



$$\sin\theta = \frac{\text{opp}}{\text{hyp}} = \frac{\sqrt{119}}{12}$$

$$\cos\theta = \frac{\text{adj}}{\text{hyp}} = \frac{5}{12}$$

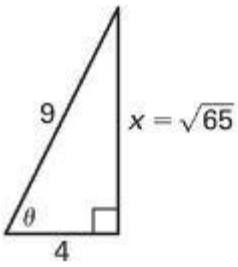
$$\tan\theta = \frac{\text{opp}}{\text{adj}} = \frac{\sqrt{119}}{5}$$

$$\csc\theta = \frac{\text{hyp}}{\text{opp}} = \frac{12}{\sqrt{119}} = \frac{12\sqrt{119}}{119}$$

$$\cot\theta = \frac{\text{adj}}{\text{opp}} = \frac{5}{\sqrt{119}} = \frac{5\sqrt{119}}{119}$$

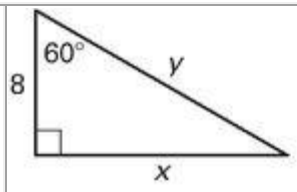
15. C;

$x = \sqrt{9^2 - 4^2} = \sqrt{65}$



$$\tan\theta = \frac{\text{opp}}{\text{adj}} = \frac{\sqrt{65}}{4}$$

17.

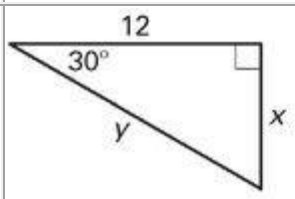


$\tan 60° = \dfrac{\text{opp}}{\text{adj}}$ $\qquad$ $\cos 60° = \dfrac{\text{adj}}{\text{hyp}}$

$\sqrt{3} = \dfrac{x}{8}$ $\qquad$ $\dfrac{1}{2} = \dfrac{8}{y}$

$8\sqrt{3} = x$ $\qquad$ $y = 16$

19.

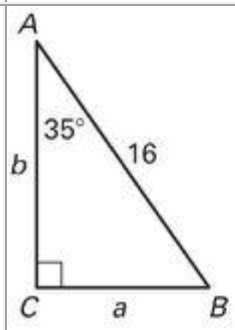


$\tan 30° = \dfrac{\text{opp}}{\text{adj}}$ $\qquad$ $\cos 30° = \dfrac{\text{adj}}{\text{hyp}}$

$\dfrac{\sqrt{3}}{3} = \dfrac{x}{12}$ $\qquad$ $\dfrac{\sqrt{3}}{2} = \dfrac{12}{y}$

$4\sqrt{3} = x$ $\qquad$ $y = 8\sqrt{3}$

21.

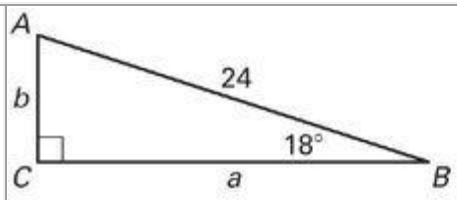


$B = 90° - 35° = 55°$

$\sin 35° = \dfrac{a}{16}$ $\qquad$ $\cos 35° = \dfrac{b}{16}$

$16(\sin 35°) = a$ $\qquad$ $16(\cos 35°) = b$

$9.18 \approx a$ $\qquad$ $13.11 \approx b$

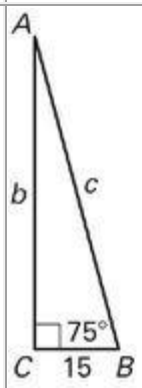
23. 

$A = 90° - 18° = 72°$

$\cos 18° = \frac{a}{24}$ $\qquad$ $\sin 18° = \frac{b}{24}$

$24(\cos 18°) = a$ $\qquad$ $24(\sin 18°) = b$

$22.83 \approx a$ $\qquad$ $7.42 \approx b$

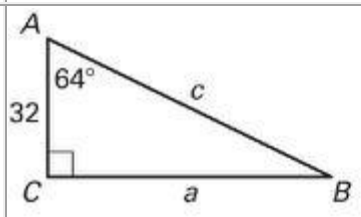
25. 

$A = 90° - 75° = 15°$

$\tan 75° = \frac{b}{15}$ $\qquad$ $\cos 75° = \frac{15}{c}$

$15(\tan 75°) = b$ $\qquad$ $c = \frac{15}{\cos 75°}$

$55.98 \approx b$ $\qquad$ $c \approx 57.96$

27. 

$B = 90° - 64° = 26°$

$\tan 64° = \frac{a}{32}$ $\qquad$ $\cos 64° = \frac{32}{c}$

$32(\tan 64°) = a$ $\qquad$ $c = \frac{32}{\cos 64°}$

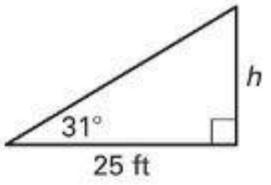
$65.61 \approx a$ $\qquad$ $c \approx 73.0$

30.

$$\tan 31° = \frac{h}{25}$$

$$25(\tan 31°) = h$$

$$15.02 \approx h$$



The height of the tree is about 15 feet.

31.

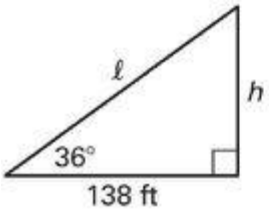
$$\sin 25° = \frac{x}{150}$$

$$150(\sin 25°) = x$$

$$63.39 \approx x$$

The length of the prop holding open the piano is about 63.4 cm.

32.



$$\tan 36° = \frac{h}{138} \qquad \cos 36° = \frac{138}{\ell}$$

$$138(\tan 36°) = h \qquad \ell = \frac{138}{\cos 36°}$$

$$100.26 \approx h \qquad \ell \approx 170.58$$

The railway's height is about 100 feet and its length is about 171 feet.