

ACT RESPONSIBLY & SUPPORT the COMMUNITY.

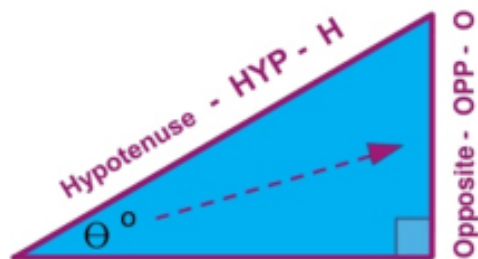
- Be on Time
- Wear ID
- Chromebook Ready
- SEE SOMETHING, SAY SOMETHING



my.hrw.com

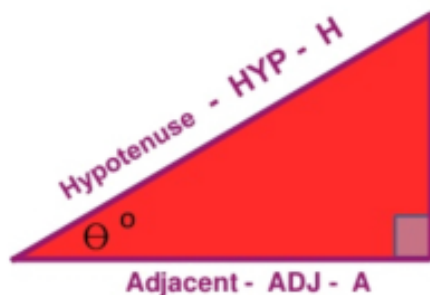
18.2 Sine and Cosine Ratios

18.2



$$\text{Sine } \theta = \frac{\text{Opposite}}{\text{Hypotenuse}}$$

SOH



$$\text{Cosine } \theta = \frac{\text{Adjacent}}{\text{Hypotenuse}}$$

CAH

*You can use a calculator to approximate the sine, cosine, and the tangent. Make sure that your calculator is in degree mode. The table shows values of each function.

SOH

$$\text{SINE} = \frac{\text{OPP}}{\text{HYP}}$$

CAH

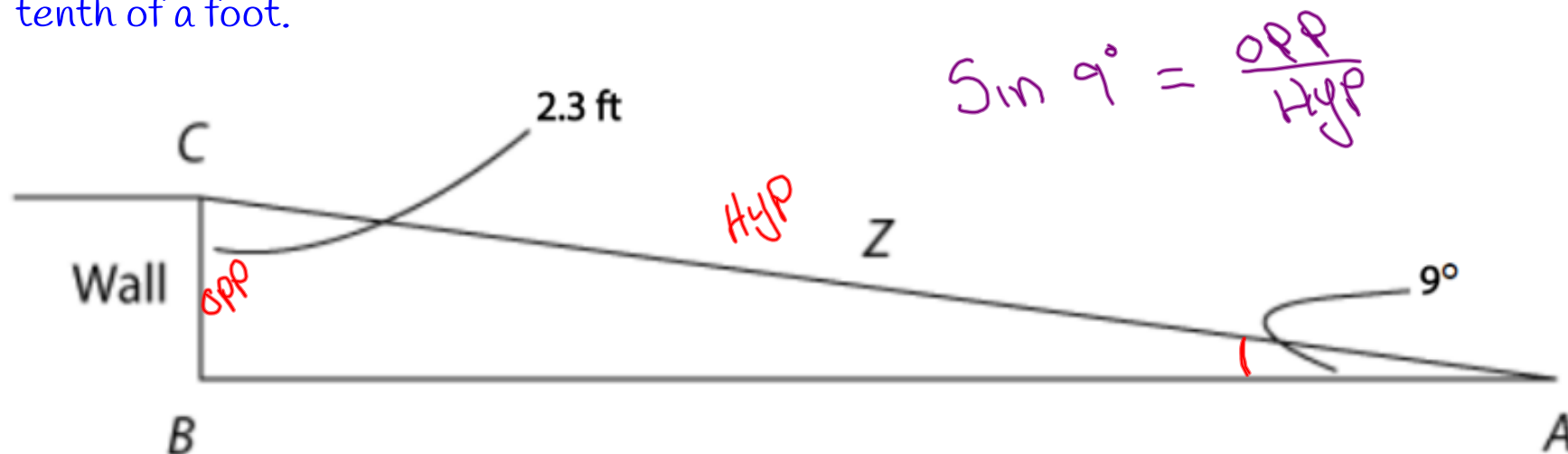
$$\text{COSINE} = \frac{\text{ADJ}}{\text{HYP}}$$

TOA

$$\text{TANGENT} = \frac{\text{OPP}}{\text{ADJ}}$$



Suppose a new regulation states that the maximum angle of a ramp for wheelchairs is 9° . At least how long must the new ramp be? Round to the nearest tenth of a foot.



$$\sin A = \frac{BC}{AC}$$

$$\sin 9^\circ = \frac{2.3}{z} \approx \frac{2.3}{\sin 9^\circ} \approx 14.7$$

2

Find the acute angle measure in $\triangle XYZ$, to the nearest degree.

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

$$\cos Y = \frac{XY}{YZ}$$

$$\cos Y = \frac{13}{23}$$

$$m\angle Y = \cos^{-1}\left(\frac{13}{23}\right)$$

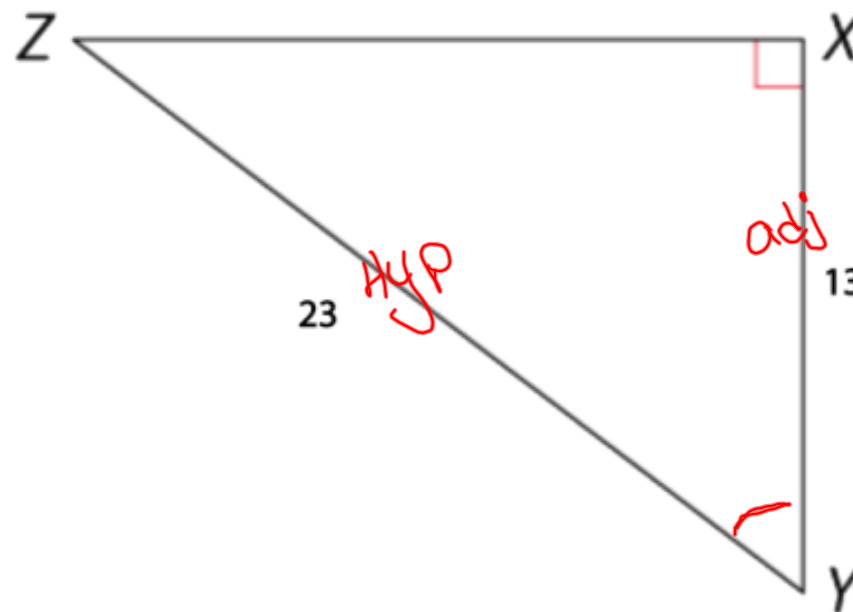
$$\approx 56^\circ$$

Find a cosine ratio

Substitute 13 for

Use the definition of the inverse cosine ratio.

Use a calculator to evaluate the inverse cosine ratio.



3

Find the acute angle θ .

$$\sin \theta = \frac{\text{opp}}{\text{Hyp}}$$

$$\sin Z = \frac{XY}{YZ}$$

Find a

$$\sin Z = \frac{14}{21}$$

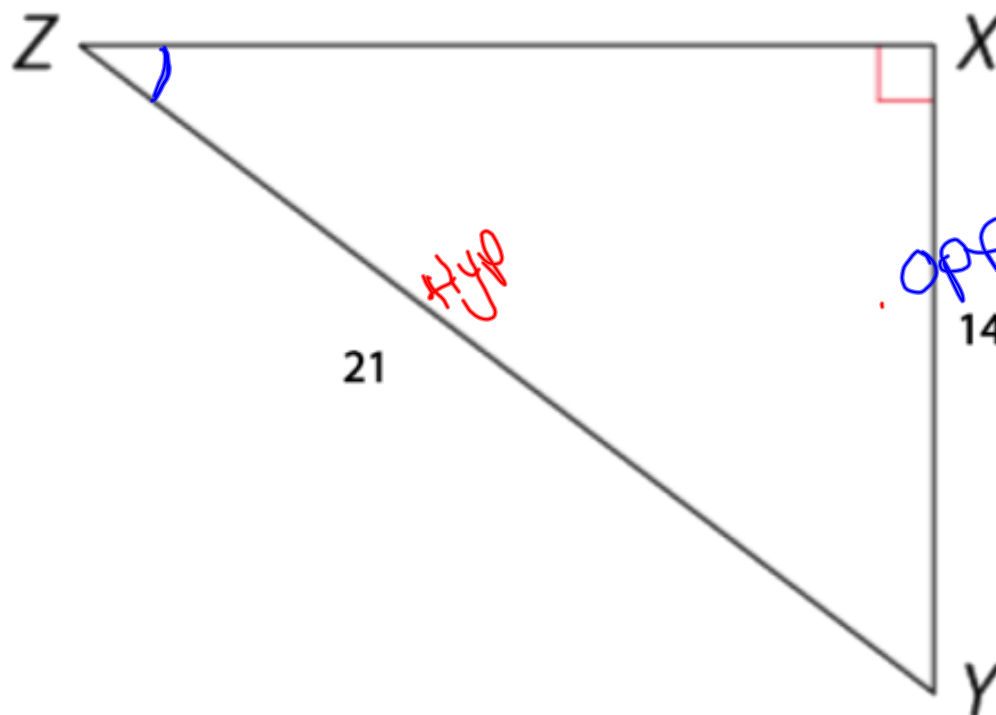
Substit

$$m\angle Z = \sin^{-1}\left(\frac{14}{21}\right)$$

Use the definition of the inverse sine ratio.

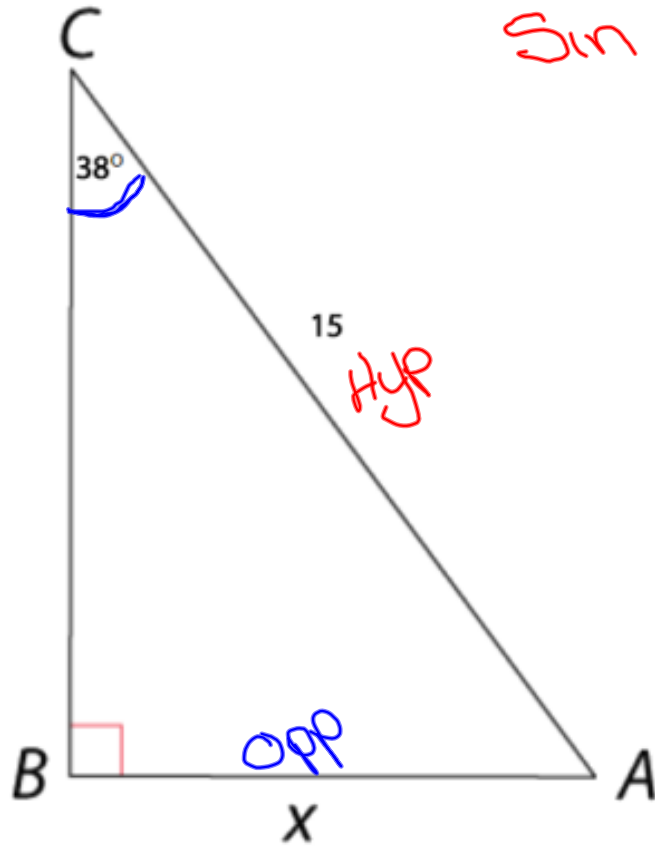
$$\approx 42^\circ$$

Use a calculator to evaluate the inverse sine ratio.



4

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



$$\sin \theta = \frac{\text{opp}}{\text{Hyp}}$$

$$\sin C = \frac{AB}{AC}$$

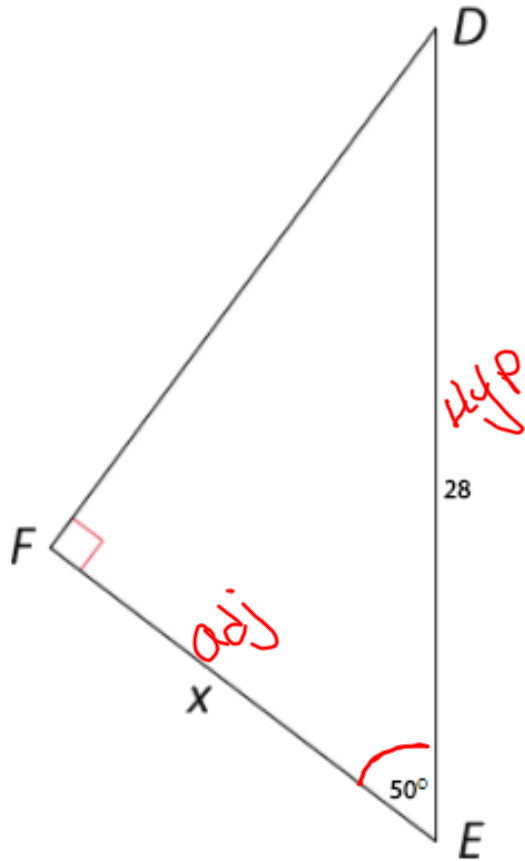
$$\sin 38^\circ = \frac{x}{15}$$

$$15 \sin 38^\circ = x$$

$$x \approx 9.2$$

5

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



$$\cos \theta = \frac{\text{adj}}{\text{Hyp}}$$

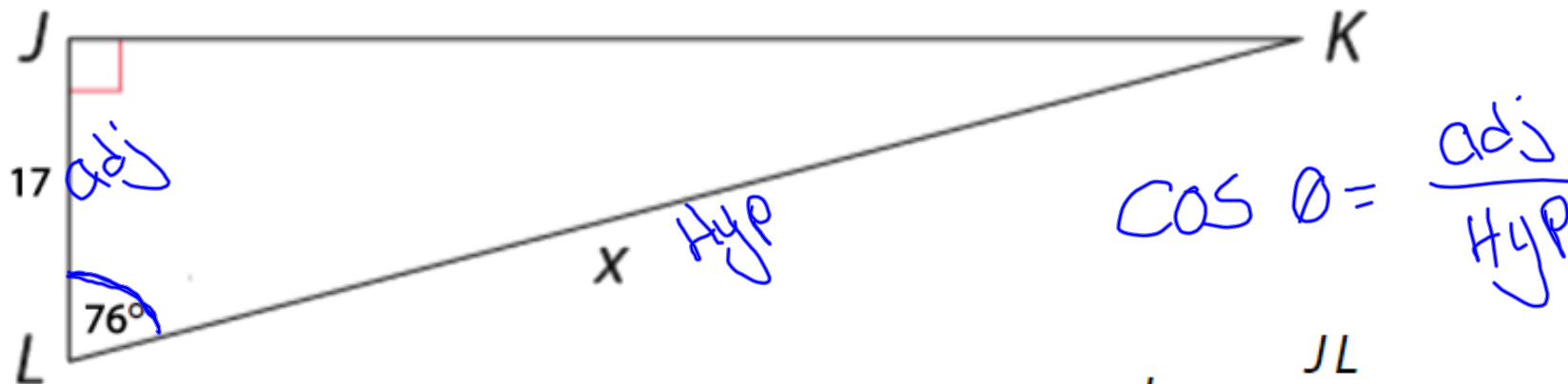
$$\cos E = \frac{EF}{DE}$$

$$\cos 50^\circ = \frac{x}{28}$$

$$28 \cos 50^\circ = x$$

$$x \approx 18$$

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



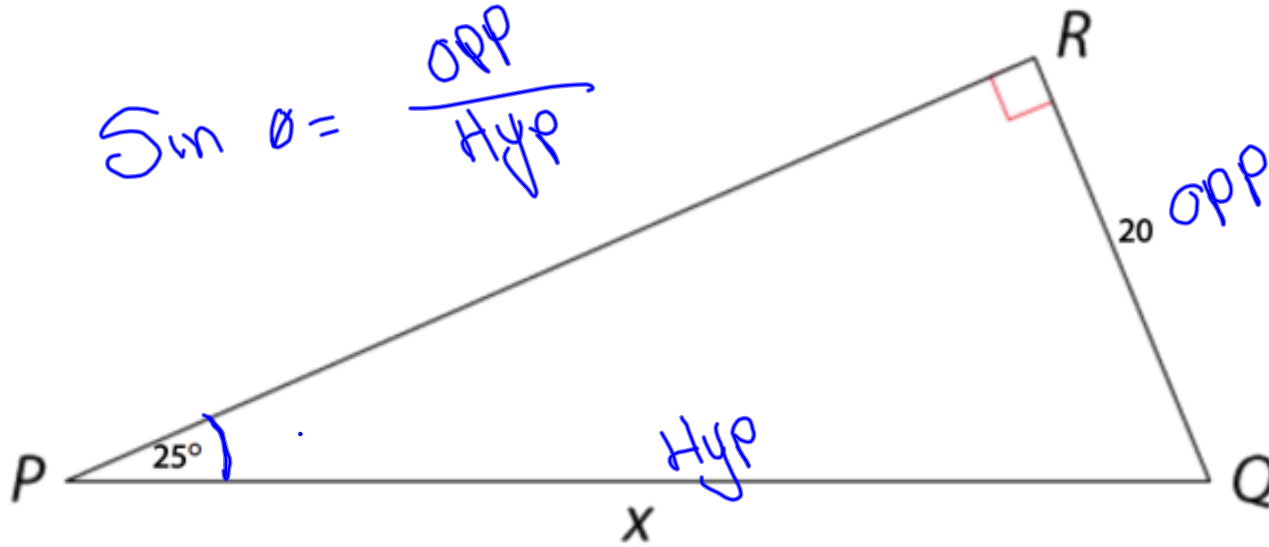
$$\cos L = \frac{JL}{KL}$$

$$\cos 76^\circ = \frac{17}{x}$$

$$x = \frac{17}{\cos 76^\circ}$$

$$x \approx 70.3$$

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



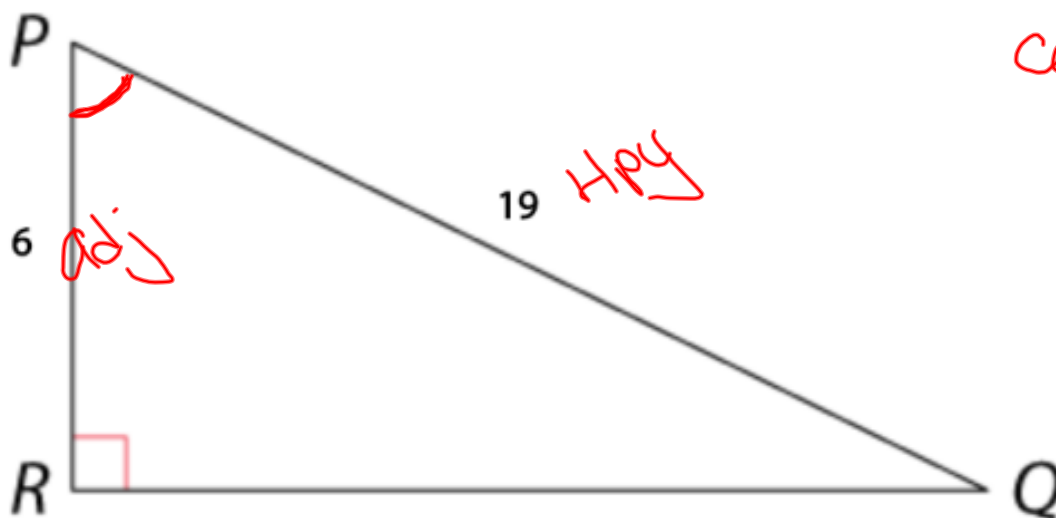
$$\sin P = \frac{QR}{PQ}$$

$$\sin 25^\circ = \frac{20}{x}$$

$$x = \frac{20}{\sin 25^\circ}$$

$$x \approx 47.3$$

8 Find the acute angle measure, to the nearest degree.



$$\cos \theta = \frac{\text{adj}}{\text{Hpy}}$$

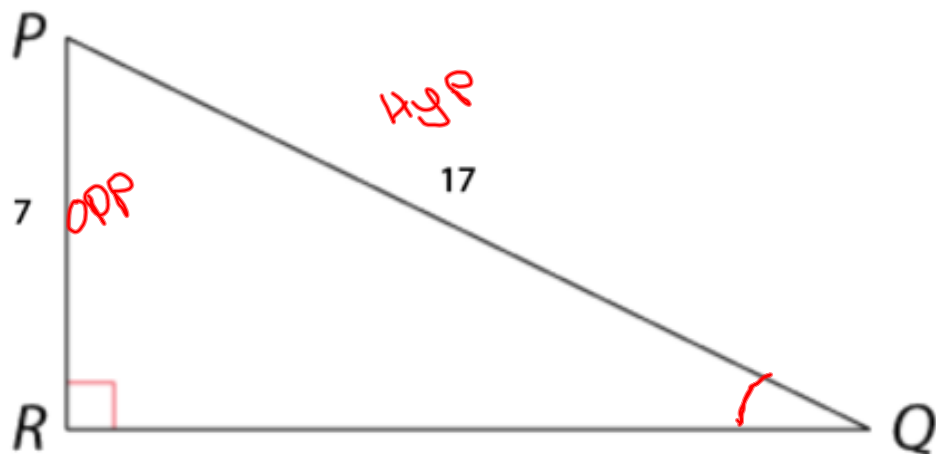
$$\cos P = \frac{PR}{PQ}$$

$$\cos P = \frac{6}{19}$$

$$m\angle P = \cos^{-1}\left(\frac{6}{19}\right) \approx 72^\circ$$

9

Find the acute angle measure, to the nearest degree.



$$\sin Q = \frac{PR}{PQ}$$

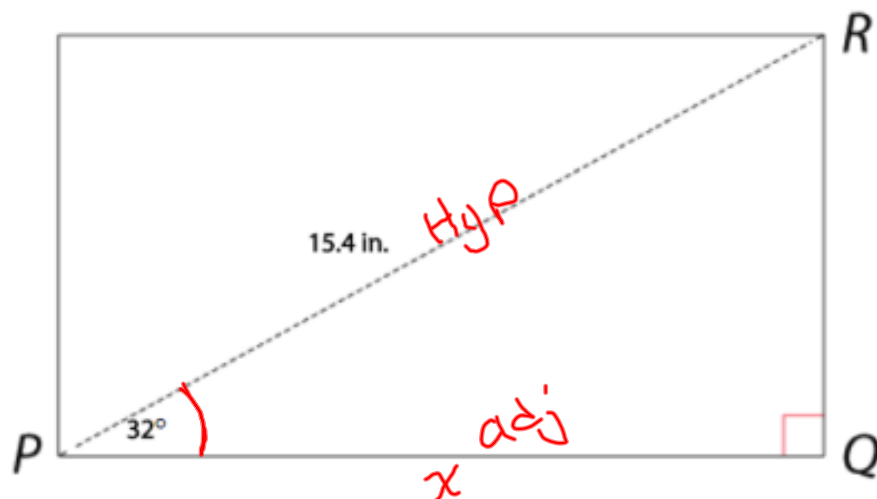
$$\sin Q = \frac{7}{17}$$

$$m\angle Q = \sin^{-1}\left(\frac{7}{17}\right) \approx 24^\circ$$

$$\sin \theta = \frac{\text{opp}}{\text{hyp}}$$

10

The specifications for a laptop computer describe its screen as measuring 15.4 in. However, this is actually the length of a diagonal of the rectangular screen, as represented in the figure. How wide is the screen horizontally, to the nearest tenth of an inch?



$$\cos \theta = \frac{\text{adj}}{\text{Hyp}}$$

$$\cos P = \frac{PQ}{PR}$$

Use the definition of cosine.

$$\cos 32^\circ = \frac{PQ}{15.4}$$

Substitute 32° for P and 15.4 for PR .

$$15.4 \cos 32^\circ = PQ$$

Multiply both sides by 15.4.

$$PQ = 13.1 \text{ in.}$$

Use a calculator to evaluate the expression.

