

Exact Triangles and More

Learning Goal: By the end of today, I will be able to use exact values instead of decimals when working with right triangles that have a 30° , 60° or 45° angle.

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Warm Up

Determine the missing angle:

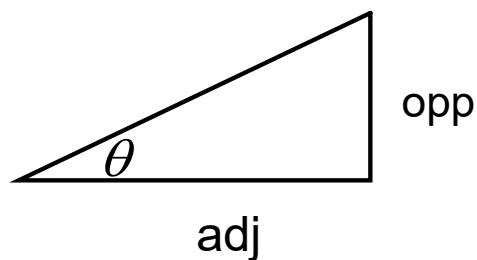
$$\tan \theta = \frac{5}{12}$$

$$\sin \theta = \frac{3}{5}$$

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When we are given a primary trigonometric ratio we can use it to draw an approximate triangle using the ratio.

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



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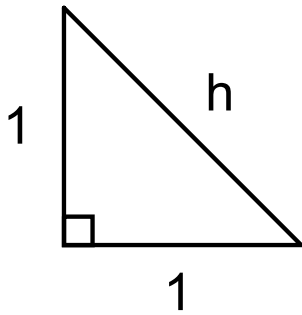
Solve for the missing angle and draw the triangle that goes with each of the following:

$$\tan \theta = \frac{15}{8}$$

$$\cos \theta = \frac{7}{10}$$

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Exact Triangles

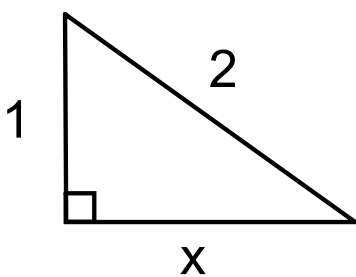
45 - 45 - 90

Solve for the hypotenuse (not in decimal form)

Find the ratios for sin, cosine and tangent

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Exact Triangles

30 - 60 - 90

Solve for the missing "x" (not in decimal form)

Find the ratios for sin, cosine and tangent

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*For these triangles the ratio of sides are always the same

Values for the six trigonometric functions

θ (Radians)	θ (Degrees)	$\sin\theta$	$\cos\theta$	$\tan\theta$	$\csc\theta$	$\sec\theta$	$\cot\theta$
$\frac{\pi}{6}$	30°	$\frac{1}{2}$	$\frac{\sqrt{3}}{2}$	$\frac{\sqrt{3}}{3}$	2	$\frac{2\sqrt{3}}{3}$	$\sqrt{3}$
$\frac{\pi}{4}$	45°	$\frac{\sqrt{2}}{2}$	$\frac{\sqrt{2}}{2}$	1	$\sqrt{2}$	$\sqrt{2}$	1
$\frac{\pi}{3}$	60°	$\frac{\sqrt{3}}{2}$	$\frac{1}{2}$	$\sqrt{3}$	$\frac{2\sqrt{3}}{3}$	2	$\frac{\sqrt{3}}{3}$

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Determine the exact values for the following:

$$\sin 60^\circ =$$

$$\cos 30^\circ =$$

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Without using a calculator determine the value of the missing angle.

$$\sin A = \frac{1}{2}$$

$$\cos A = \frac{1}{\sqrt{2}}$$

$$\sin A = \frac{\sqrt{3}}{2}$$

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Homework

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Attachments

4-3 - summary.pdf