

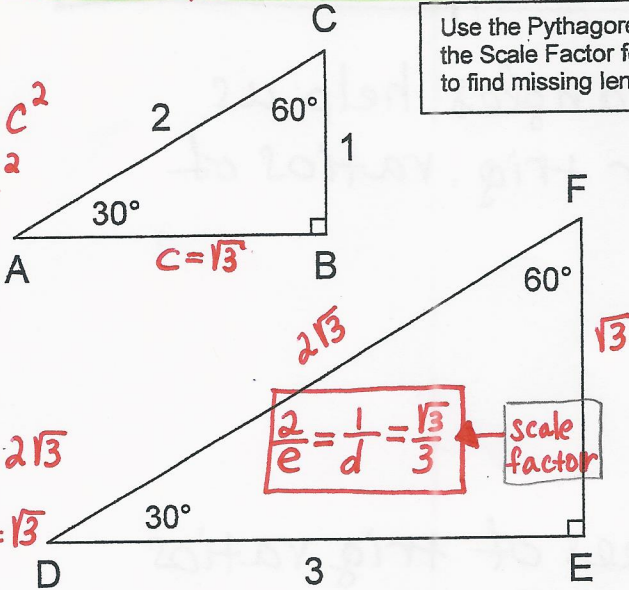
The Basic Trigonometric Ratios

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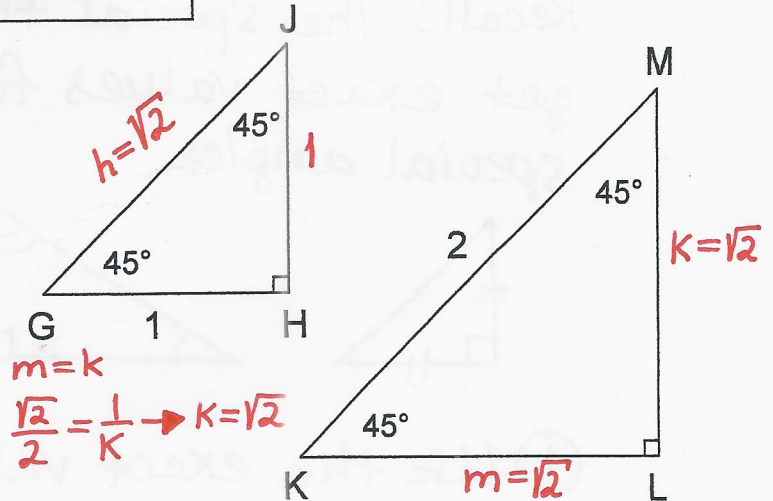
Remark:  $\sqrt{3} \approx 1.7$ ;  $\sqrt{2} \approx 1.4$

Use the Pythagorean Theorem and the Scale Factor for similar triangles to find missing lengths of sides.

$2^2 = 1^2 + c^2$   
 $4 = 1 + c^2$   
 $c^2 = 3$   
 $c = \pm\sqrt{3}$   
 $c > 0$   
 $c = \sqrt{3}$



$h^2 = 1^2 + 1^2$   
 $h^2 = 2, h = \sqrt{2}, h > 0$



Angle		Ratios		
Name	Size in $^\circ$	$\frac{\text{opposite}}{\text{hypotenuse}}$	$\frac{\text{adjacent}}{\text{hypotenuse}}$	$\frac{\text{opposite}}{\text{adjacent}}$
$\angle A$	$30^\circ$	$\frac{1}{2}$	$\frac{\sqrt{3}}{2}$	$\frac{1}{\sqrt{3}} = \frac{\sqrt{3}}{3}$
$\angle C$	$60^\circ$	$\frac{\sqrt{3}}{2}$	$\frac{1}{2}$	$\frac{\sqrt{3}}{1} = \sqrt{3}$
$\angle D$	$30^\circ$	$\frac{\sqrt{3}}{2\sqrt{3}} = \frac{1}{2}$	$\frac{3}{2\sqrt{3}} = \frac{\sqrt{3}}{2}$	$\frac{\sqrt{3}}{3}$
$\angle F$	$60^\circ$	$\frac{3}{2\sqrt{3}} = \frac{\sqrt{3}}{2}$	$\frac{\sqrt{3}}{2\sqrt{3}} = \frac{1}{2}$	$\frac{3}{\sqrt{3}} = \sqrt{3}$
$\angle G$	$45^\circ$	$\frac{1}{\sqrt{2}}$	$\frac{1}{\sqrt{2}}$	1
$\angle M$	$45^\circ$	$\frac{\sqrt{2}}{2}$	$\frac{\sqrt{2}}{2}$	$\frac{\sqrt{2}}{\sqrt{2}} = 1$
Ratio Names $\rightarrow$		sine ratio	cosine ratio	tangent ratio

Idea: For  $30^\circ$  angle, sine, cosine and tangent ratios are the same regardless of which one of infinitely many similar RA triangles the angle is housed in.

ratio \ $\theta$	$0^\circ$	$30^\circ$	$45^\circ$	$60^\circ$	$90^\circ$
$\sin \theta$	0	$\frac{1}{2}$	$\frac{1}{\sqrt{2}} = \frac{\sqrt{2}}{2}$	$\frac{\sqrt{3}}{2}$	1
$\cos \theta$	1	$\frac{\sqrt{3}}{2}$	$\frac{1}{\sqrt{2}} = \frac{\sqrt{2}}{2}$	$\frac{1}{2}$	0
$\tan \theta$	0	$\frac{1}{\sqrt{3}} = \frac{\sqrt{3}}{3}$	1	$\sqrt{3}$	undefined