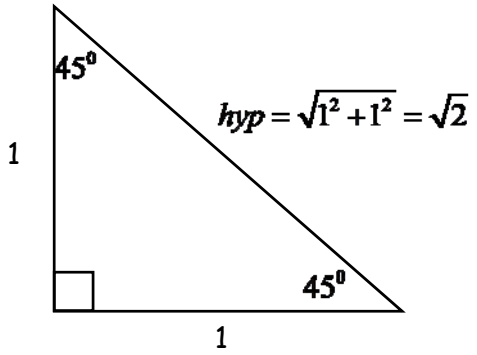
Precalculus 11 **Sec 2.2x – Trigonometric Ratios of Special Angles**

In trigonometry, there are 2 special right triangles in which the trigonometric ratios of the angles will be always be exact values.

- The $45^0 - 45^0 - 90^0$ triangle

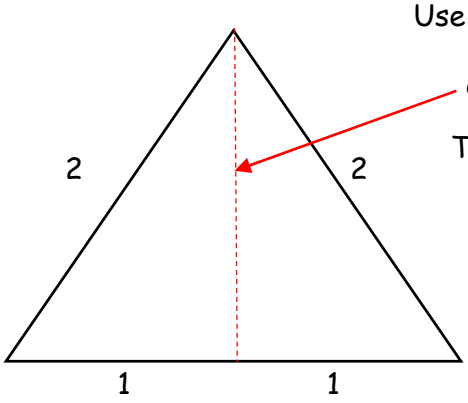


Using Pythagoras, we can determine the exact length of the hypotenuse

Therefore, the trig ratios for this triangle in Q1 are:

$\sin 45^0 = \frac{1}{\sqrt{2}}$ $\cos 45^0 = \frac{1}{\sqrt{2}}$ $\tan 45^0 = \frac{1}{1} = 1$

- The $30^0 - 60^0 - 90^0$ triangle uses an equilateral triangle with side lengths of 2



Use Pythagoras to determine the exact length of the altitude

$a = \sqrt{2^2 - 1^2} = \sqrt{3}$

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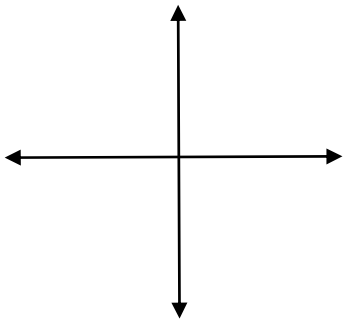
To determine the other angles in Q2, Q3 and/or Q4, you must use reference angles, so it's important that you remember your CAST rule.

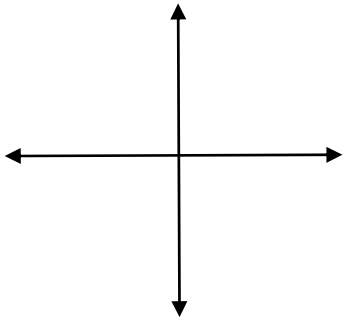
Example 1: Determine the exact values of the following angles.

a) $\sin 210^0$	b) $\cos 1575^0$	c) $\tan -1140^0$

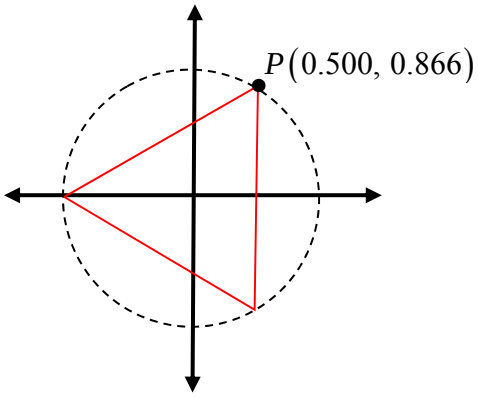
Example 2: Determine the exact coordinates of a point P(x, y) on the unit circle when $\tan\theta = \sqrt{3}$, and sin θ and cos θ is (-)ve



Example 3: Point $P\left(\sqrt{3},\ -1\right)$, is on the terminal arm of a unit circle in standard position. What are the exact values of sin θ, cos θ, tan θ, and the measure of angle θ, in standard position?



Example 4: The graph shows an equilateral triangle whose vertices lie on a unit circle with center (0, 0). Determine the exact value of the trigonometric ratios at each vertex



Homework: