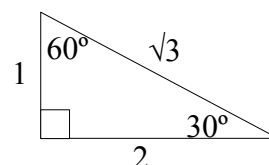
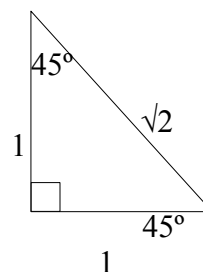


MCR3U – Trigonometric Ratios for Special Angles

We want you to be able to determine the exact trigonometric ratio for the sin, cos and tan of angles that are multiples of 30° or 45° . To do this:

- Memorize the special triangles, shown at right
1. Draw the angle on a grid
 2. Draw a vertical line from the tip of the angle to the horizontal axis
 3. Label the angles in the triangle, and label the corresponding side lengths according to the special triangles. If a side length goes **left or down, it's negative**. Hypotenuse is always positive.
 4. Determine the trigonometric ratio from the triangle you've drawn. Use the angle closest to the origin.



Without a calculator, calculate the exact trigonometric ratio for each of the following angles:

a) $\sin 60^\circ$

b) $\cos 135^\circ$

When calculating exact trig ratios:

- ALWAYS include a sketch
- Watch out for negatives!

c) $\tan 210^\circ$

d) $\sin 300^\circ$

e) $\tan 330^\circ$

f) $\sin 225^\circ$

- If the angle is a multiple of 90° , use your calculator instead. Sometimes it won't exist.

Find each of these exact trig ratios for each of the following:

- | | | | |
|--------------------|---------------------|---------------------|---------------------|
| a) $\sin 90^\circ$ | b) $\sin 180^\circ$ | c) $\sin 270^\circ$ | d) $\sin 360^\circ$ |
| a) $\cos 90^\circ$ | b) $\cos 180^\circ$ | c) $\tan 270^\circ$ | d) $\tan 360^\circ$ |

Homework:

1. Find the exact trigonometric ratios for each of the following:

- | | | |
|---------------------|---------------------|---------------------|
| a) $\sin 45^\circ$ | b) $\cos 120^\circ$ | c) $\tan 315^\circ$ |
| d) $\sin 150^\circ$ | e) $\tan 240^\circ$ | f) $\cos 210^\circ$ |
| g) $\tan 30^\circ$ | h) $\sin 270^\circ$ | i) $\tan 90^\circ$ |

2. Determine each of the following:

- | | | | |
|--------------------|---------------------|---------------------|---------------------|
| a) $\sin 45^\circ$ | b) $\sin 135^\circ$ | c) $\sin 225^\circ$ | d) $\sin 315^\circ$ |
|--------------------|---------------------|---------------------|---------------------|

3. In which quadrants is the **sine positive**? (refer to your answers (a) to (d) above).

4. Determine each of the following:

- | | | | |
|--------------------|---------------------|---------------------|---------------------|
| a) $\cos 45^\circ$ | b) $\cos 135^\circ$ | c) $\cos 225^\circ$ | d) $\cos 315^\circ$ |
|--------------------|---------------------|---------------------|---------------------|

5. In which quadrants is the **cosine positive**? (refer to your answers (a) to (d) above).

6. Determine each of the following:

- | | | | |
|--------------------|---------------------|---------------------|---------------------|
| a) $\tan 45^\circ$ | b) $\tan 135^\circ$ | c) $\tan 225^\circ$ | d) $\tan 315^\circ$ |
|--------------------|---------------------|---------------------|---------------------|

7. In which quadrants is the **tangent positive**? (refer to your answers (a) to (d) above).