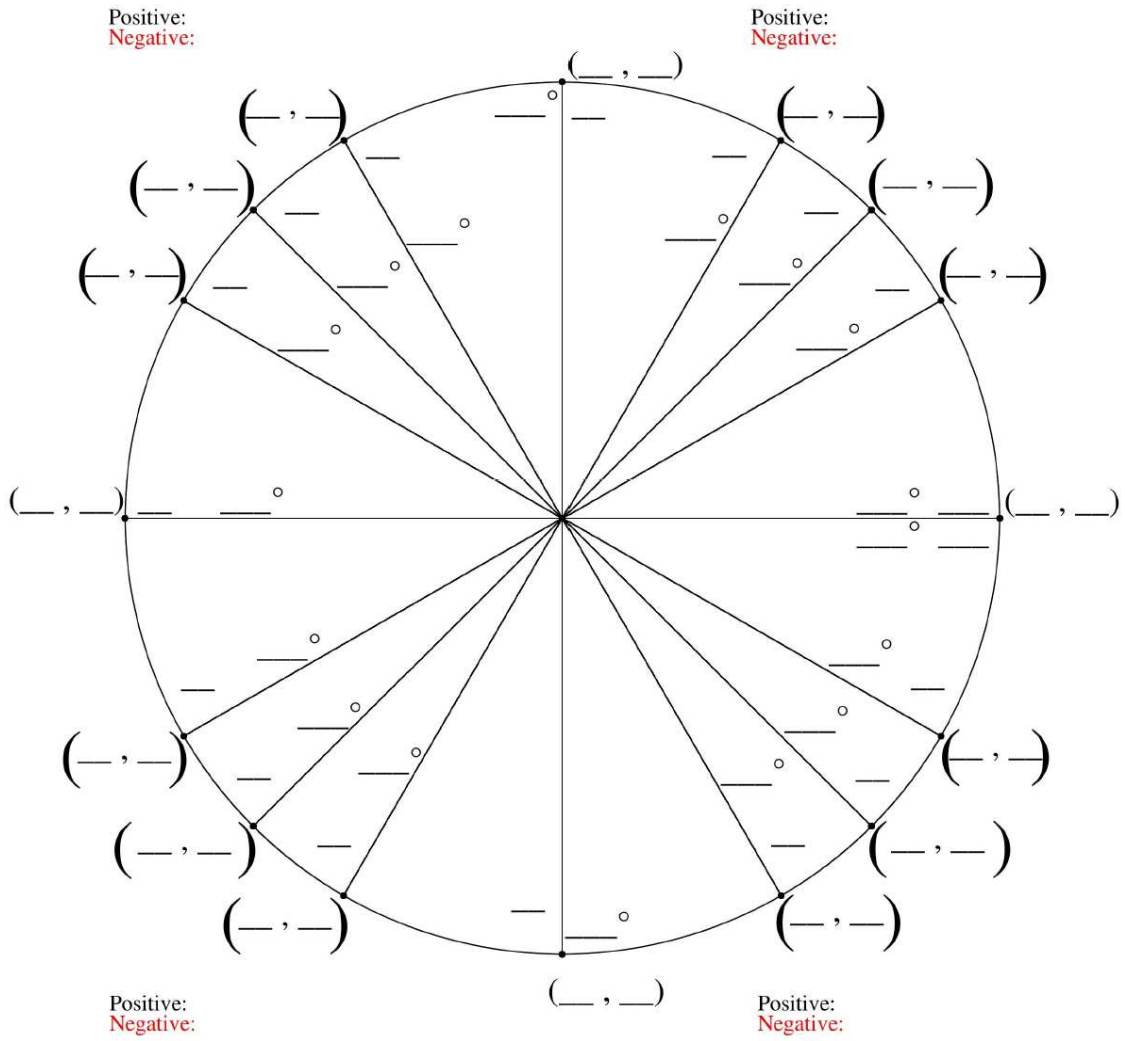


Method 1: Fill 'em in. Learn the patterns.



Method 2:

### The Chart

Write down the angle measures, starting with  $0^\circ$  and continue until you reach  $90^\circ$ . Under these, write down the equivalent radian measures. Under these, write down the numbers from 0 to 4. Next, take the square root of the values and simplify if possible. Divide each value by 2. This gives you the sine value of each of the angles you need. To find the cosine values, write the previous line in the reverse order.

Now you have the sine and cosine values for the quadrantal angles and the special angles. From these, you can find the rest of the trig values for these angles. Write the problem in terms of the reference angle. Then use the chart you created to find the appropriate value.

### Method 3: The Hand Trick

Best to not do this with others watching.....

Spread out the fingers on your left hand, palm side up. Your pinkie finger represents the positive x axis and your thumb represents the positive y axis. See it? You have the first quadrant of the unit circle in the palm of your hand.

Your ring finger is  $30^\circ$  or  $\frac{\pi}{6}$ .

Your middle finger is  $45^\circ$  or  $\frac{\pi}{4}$ .

Your index finger is  $60^\circ$  or  $\frac{\pi}{3}$ .

Now assume there is a big 2 in the palm of your hand.

Let's say you want to find the sine of the 5 angles you need to know.

Start with  $\sin 0^\circ$ . The angle is along the positive x axis, so it's represented by your pinkie finger. How many fingers are below your pinkie finger? None. Zero.

Find  $\sqrt{0}$  which is 0. That's the numerator. That big 2 in the palm of your hand? That's the denominator. So you have  $\frac{0}{2} = 0$ . So  $\sin 0^\circ = 0$ .

Now let's find  $\sin 30^\circ$ . That's your ring finger. Bend it in. How many fingers are below the ring finger? Just one. Find  $\sqrt{1}$  which is 1. Put it over that big 2 in the palm of your hand.  $\sin 30^\circ = \frac{1}{2}$ .

Let's move on to  $\sin 45^\circ$ . That's your middle finger. Bend it in. How many fingers are below your middle finger? Two. Find  $\sqrt{2}$ . We can't simplify that. That's your numerator. The denominator is that big 2 from the palm of your hand. So  $\sin 45^\circ = \frac{\sqrt{2}}{2}$ .

Now let's do  $\sin 60^\circ$ . That's your index finger. Bend it in. There are three fingers below your index finger. So  $\sin 60^\circ = \frac{\sqrt{3}}{2}$ .

For  $\sin 90^\circ$ , you'll have 4 fingers below your thumb.  $\sqrt{4} = 2$ , so  $\sin 90^\circ = 1$ .

For the cosine values, you do this quite similarly, except you count the number of fingers ABOVE your angle instead of below. For example, for  $\cos 60^\circ$ , you'll have 1 finger above your index finger.  $\sqrt{1} = 1$ , so  $\cos 60^\circ = \frac{1}{2}$ .

And that's the hand trick.

There's a video of it on YouTube (not me, but she does a decent job...check it out).