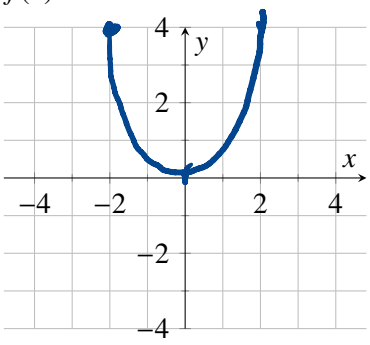
Transformation Review

1. Explain what each does to the *original* graph $y = f(x)$.

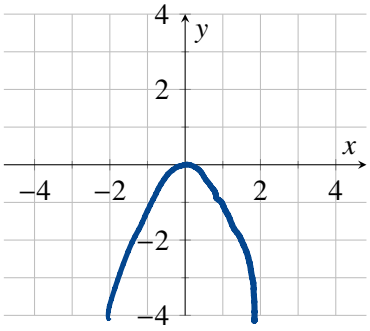
Assume $c > 0$	Description	Assume $c > 1$	Description
$f(x) + c$	shift ↑ by c	$cf(x)$	scale y ↑ by c
$f(x) - c$	shift ↓ by c	$f(cx)$	scale x ↓ by $\frac{1}{c}$
$f(x + c)$	shift ← by c	$-f(x)$	flip ↕
$f(x - c)$	shift → by c	$f(-x)$	flip ↔

2. Let $f(x) = x^2$. Graph each of the following *using the ideas from # 1 above.*

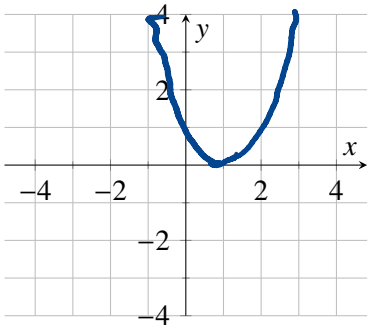
(a) $f(x)$



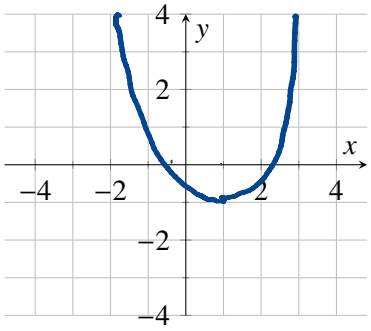
(b) $-f(x)$



(c) $f(x - 1)$

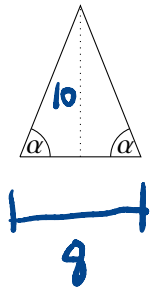


(d) $f(x - 1) - 1$



Trigonometry Review

3. An isosceles triangle has a height of 10 ft and its base is 8 feet long. Determine the sine, cosine, tangent, cotangent, secant and cosecant of the base angle α.



$10^2 + 4^2 = c^2$

$100 + 16 = c^2$

$116 = c^2$

$c = \sqrt{116}$

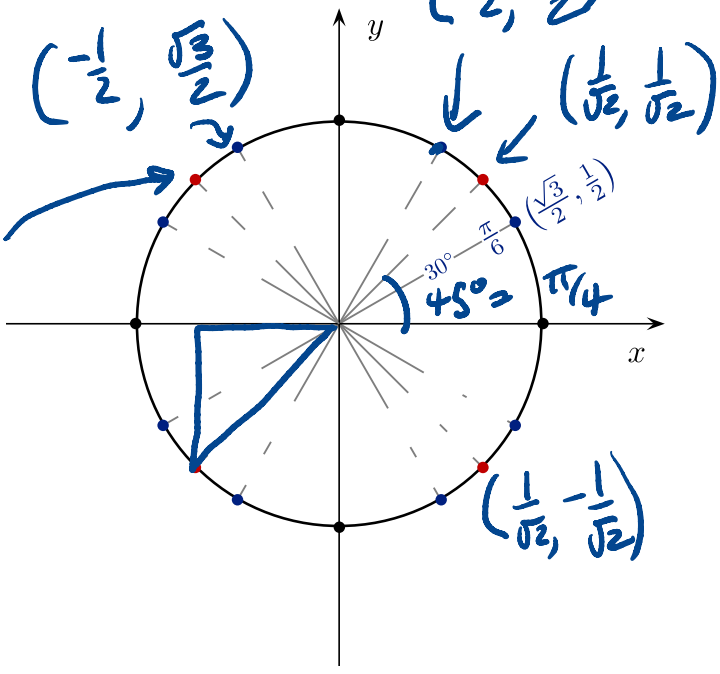
$\sec\alpha = \frac{1}{\cos\alpha} = \frac{\sqrt{116}}{4}$

$\csc\alpha = \frac{1}{\sin\alpha} = \frac{\sqrt{116}}{10}$

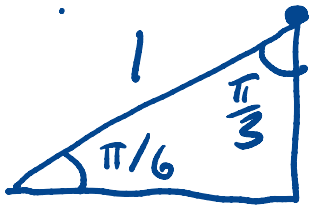
$\cot\alpha = \frac{1}{\tan\alpha} = \frac{2}{5}$

$\sin\alpha = \frac{10}{\sqrt{116}}$ $\cos\alpha = \frac{4}{\sqrt{116}}$ $\tan\alpha = \frac{10}{4} = \frac{5}{2}$

4. Using a 45-45-90 triangle and a 30-60-90 triangle find the coordinates of **any three marked points, one of each color** on the unit circle. (The blue points are at multiples of $\frac{\pi}{6}$, the red points are at multiples of $\frac{\pi}{4}$, and the black points are at multiples of $\frac{\pi}{2}$.)



$(\frac{1}{2}, \frac{\sqrt{3}}{2})$ $(\frac{-1}{2}, \frac{\sqrt{3}}{2})$ $(\frac{1}{\sqrt{2}}, \frac{1}{\sqrt{2}})$ $(\frac{-1}{\sqrt{2}}, \frac{1}{\sqrt{2}})$ $(\frac{1}{\sqrt{2}}, \frac{-1}{\sqrt{2}})$



$(\cos\frac{\pi}{6}, \sin\frac{\pi}{6})$ $(\frac{\sqrt{3}}{2}, \frac{1}{2})$

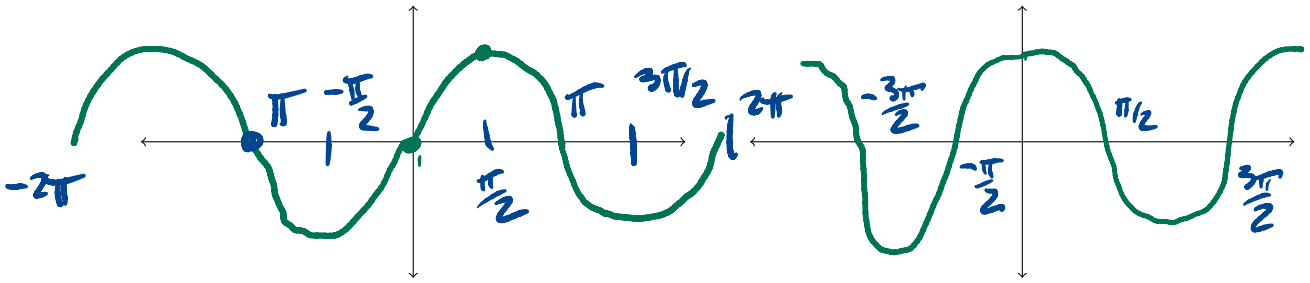
5. Without a calculator evaluate:

(a) $\sin(\frac{2\pi}{3})$ $\frac{\sqrt{3}}{2}$

(b) $\cos(\frac{5\pi}{4}) = -\frac{\sqrt{2}}{2}$

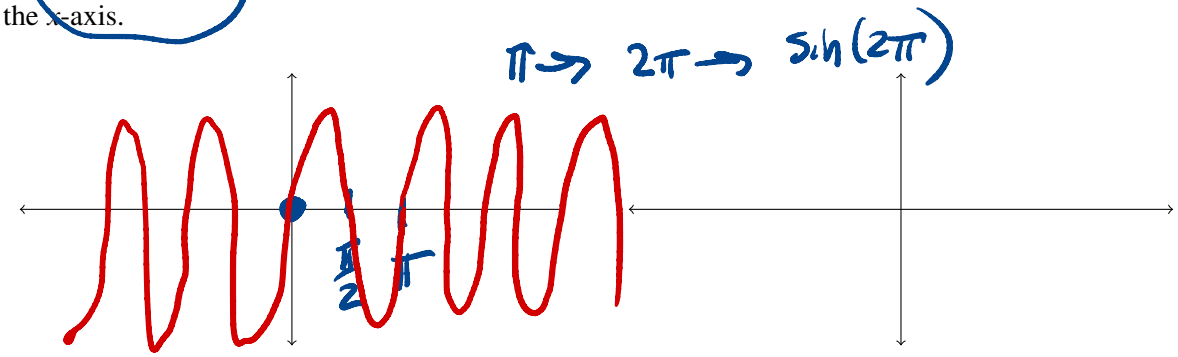
(c) $\tan(\frac{-\pi}{4}) = \frac{\sin(\pi/4)}{\cos(\pi/4)} = -1$

6. On the axes below, graph *at least two cycles* of $f(x) = \sin x$, $f(x) = \cos(x)$. Label all x- and y-intercepts.



omit

7. (a) Graph $y = \sin(2x)$ and ~~$y = 3 - 2\cos(x)$~~ on adjacent graphs. Label the points $0, \pi/2, \pi, 3\pi/2$ and 2π on the ~~x~~-axis.



(b) Use the graph of $f(x) = \sin(2x)$ to determine the domain of f(x) = csc(2x)

$$\csc(2x) = \frac{1}{\sin(2x)}$$

$\sin(2x) \neq 0$

$x = k\frac{\pi}{2}$ k is an integer

$k \in \mathbb{Z}$