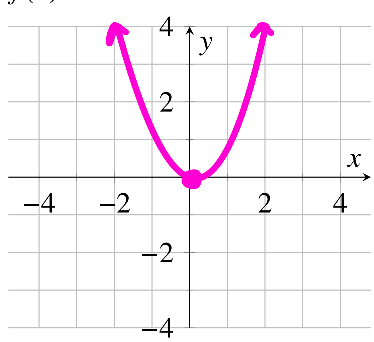
Transformation Review

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

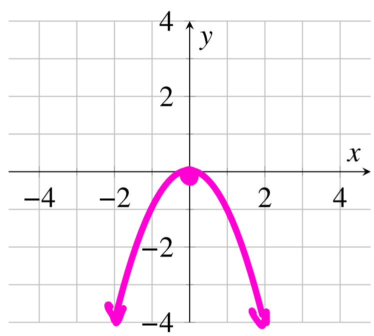
Assume $c > 0$	Description	Assume $c > 1$	Description
$f(x) + c$	Shift $y=f(x)$ per c units upward	$cf(x)$	Stretch $y=f(x)$ vertically by c
$f(x) - c$	Shift $y=f(x)$ per c units downward	$f(cx)$	Shrink $y=f(x)$ horizontally by c
$f(x + c)$	Shift $y=f(x)$ per c units to the left	$-f(x)$	reflect $y=f(x)$ about x-axis
$f(x - c)$	Shift $y=f(x)$ per c units to the right	$f(-x)$	reflect $y=f(x)$ about y-axis

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

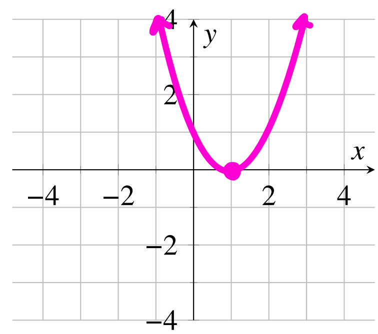
(a) $f(x)$



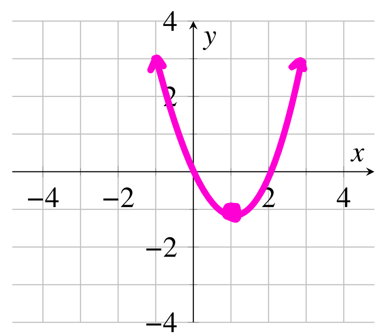
(b) $-f(x)$



(c) $f(x - 1)$

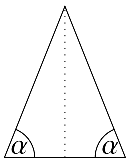


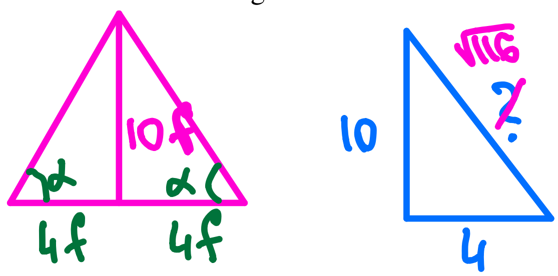
(d) $f(x - 1) - 1$



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.



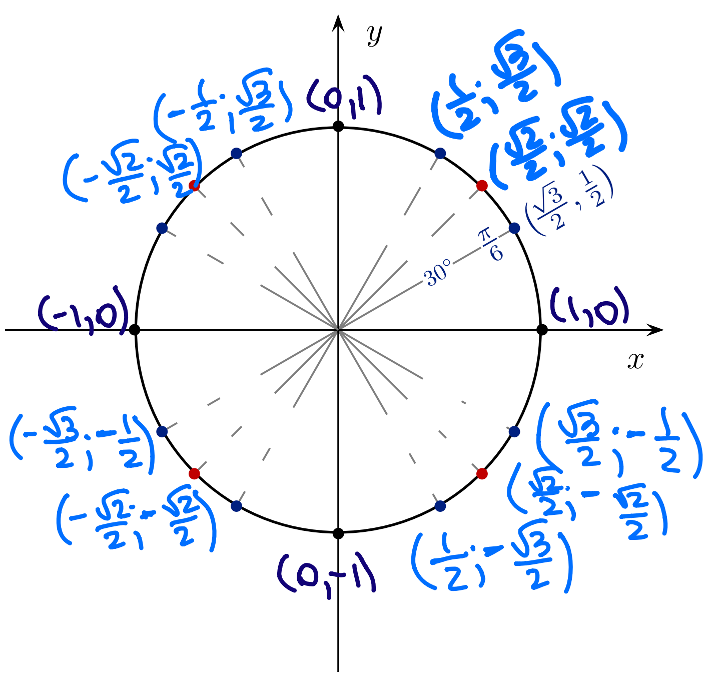


$100 + 16 = x^2$
$x^2 = 116$
$x = \sqrt{116}$

$\cos\alpha = \frac{4}{\sqrt{116}}$ $\tan\alpha = \frac{10}{4}$ $\sec\alpha = \frac{\sqrt{116}}{4}$

$\sin\alpha = \frac{10}{\sqrt{116}}$ $\cot\alpha = \frac{4}{10}$ $\csc\alpha = \frac{\sqrt{116}}{10}$

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 $\frac{\pi}{2}$.)



5. Without a calculator evaluate:

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

$\sin\left(\frac{2\pi}{3}\right) = \sin\left(\pi - \frac{\pi}{3}\right) =$

$= \frac{\sqrt{3}}{2}$

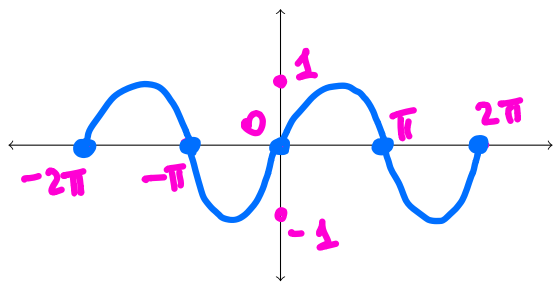
(b) $\cos(\frac{5\pi}{4})$ $=$

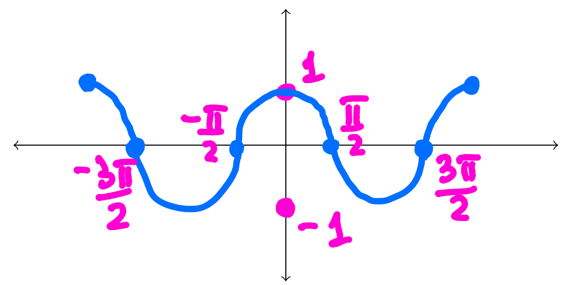
$= \cos\left(\pi + \frac{\pi}{4}\right) =$

$= -\frac{\sqrt{2}}{2}$

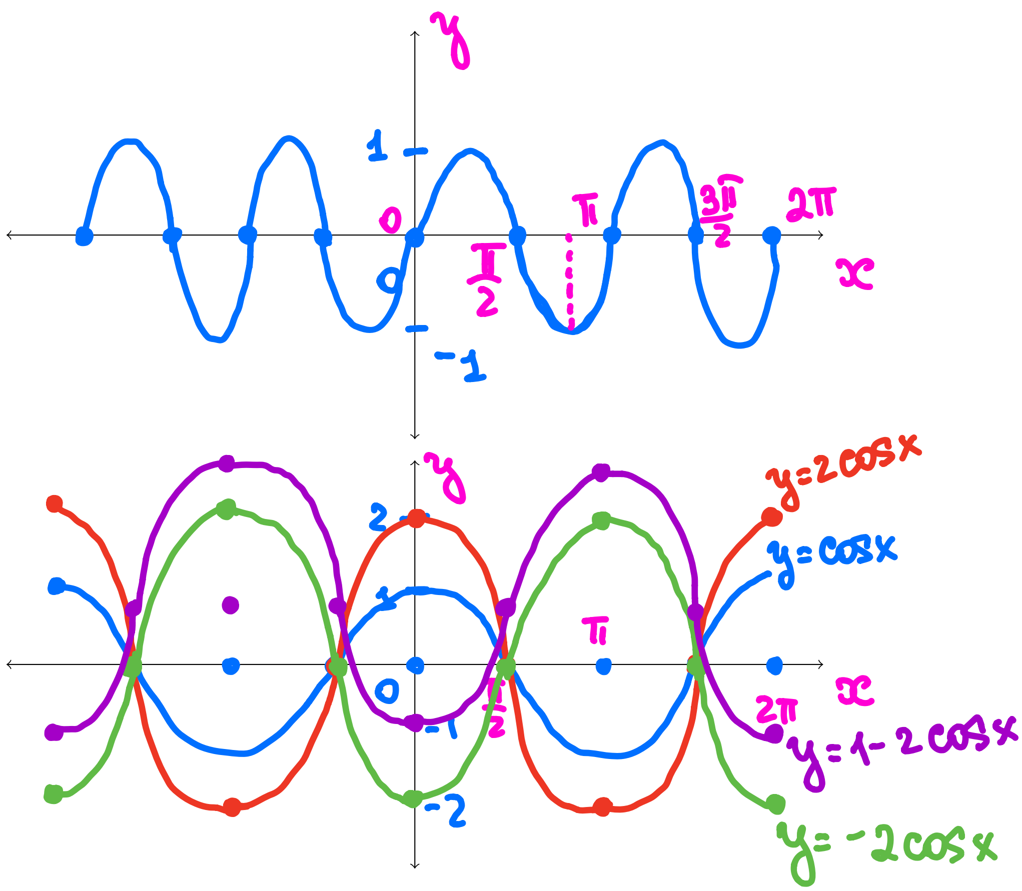
(c) $\tan(\frac{-\pi}{4})$ $= -\tan\left(\frac{\pi}{4}\right) = -1$

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.





7. (a) Graph $y = \sin(2x)$ and $y = \cancel{2}\,1 - 2\cos(x)$ 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)

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

$$x \neq 0, \pm\frac{\pi}{2}, \pm\pi, \pm\frac{3\pi}{2}, \pm 2\pi, \ldots$$

$$\sin(2x) \neq 0$$

$$2x \neq \pi k, \quad k \text{ in } \mathbb{Z}$$

$$x \neq \frac{\pi k}{2}, \quad k \text{ in } \mathbb{Z}$$