

### Graphing Sine & Cosine p. 46

$y = a \text{ trig}(bx - c) + d$

Amplitude (a) is the height from midline to floor & ceiling  
 Vertical Shift (d) is the new midline  
 Beginning point (left):  $(bx-c)=0$  End point (right):  $(bx-c)=2\pi$

Graph 1 period. Label 5 points on the x-axis.

1.  $y = 3 \sin(2\theta) + 1$

$a=3$  (height from midline)  $d=1$  (midline)

- Sketch new midline (d)
- Sketch ceiling & floor (use a)
- Label x-axis with 5 points (beg & end pt & 3 in between)
- Sketch the curve in the box

Beg:  $\frac{2\theta}{2} = 0$  End:  $\frac{2\theta}{2} = 2\pi$   
 $\theta = 0$   $\theta = \pi$

Sketch + sin in the box

2.  $y = -1/2 \cos(2\theta + \pi) - 2$

$a = \frac{1}{2}$   $d = -2$

Beg:  $2\theta + \pi = 0$  End:  $2\theta + \pi = 2\pi$   
 $\frac{2\theta}{2} = \frac{-\pi}{2}$   $\frac{2\theta}{2} = \frac{2\pi - \pi}{2}$   
 $\theta = -\pi/2$   $\theta = \pi/2$

Sketch -cos

To find midpts, add endpoints  $\div$  by 2

$0 + \frac{\pi}{2} = \frac{\pi}{2} \div 2 = \frac{\pi}{4}$   
 $\frac{\pi}{2} + \frac{\pi}{2} = \pi \div 2 = \frac{\pi}{2}$

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### Graphing Cosecant & Secant

1.  $y = 2 \csc(\theta + \pi/2) - 1$

$a=2$   $d=-1$

Beg:  $\theta + \frac{\pi}{2} = 0$  End:  $\theta + \frac{\pi}{2} = 2\pi$   
 $\frac{\theta}{1} = \frac{-\pi/2}{1}$   $\frac{\theta}{1} = \frac{2\pi - \pi/2}{1}$   
 $\theta = -\pi/2$   $\theta = \frac{4\pi - \pi}{2} = \frac{3\pi}{2}$

2.  $y = -3 \sec(2\theta - 3\pi)$

$a=3$   $d=0$

Beg:  $2\theta - 3\pi = 0$  End:  $2\theta - 3\pi = 2\pi$   
 $2\theta = 3\pi$   $2\theta = 5\pi$   
 $\theta = 3\pi/2$   $\theta = 5\pi/2$

$\frac{3\pi}{2} + \frac{2\pi}{2} = \frac{3\pi + 4\pi}{2} = \frac{7\pi}{2}$   
 $\frac{7\pi}{2} \div 2 = \frac{7\pi}{4}$   
 $\frac{3\pi}{2} + \frac{2\pi}{2} = \frac{3\pi}{2}$   
 $\frac{3\pi}{2} \div 2 = \frac{3\pi}{4}$

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