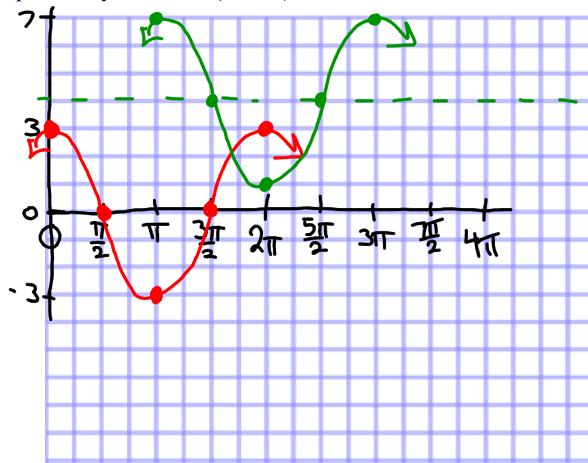


### Translations of Sine and Cosine Graphs

$y = a \sin b(x-h) + k$        $y = a \cos b(x-h) + k$

1. Identify the period and amplitude. Plot the parent graph.  $y = a \sin bx$   
 $y = a \cos bx$
2. Draw the midline ( $y = k$ )
3. Translate the 5 key points horizontally  $h$  units and vertically  $k$  units.
4. If  $a < 0$ , reflect in the midline.

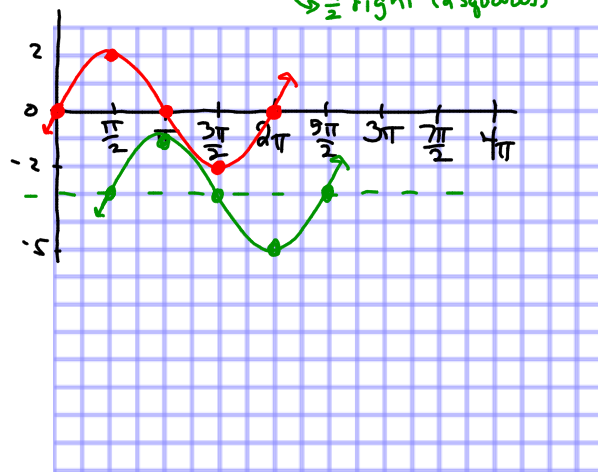
Example 1:  $y = 3 \cos(x - \pi) + 4$



$y = 3 \cos x$

Period  $\frac{2\pi}{1}$   
 $= 2\pi$

Example 2:  $y = 2 \sin(x - \frac{\pi}{2}) - 3$



Parent:  $y = 2 \sin x$

Period =  $2\pi$

P. 919/3-10, 16, 18, 42-45

P. 913/17, 20, 22, 24  
due Monday