

1. Graph $f(\theta) = 3\sin\theta - 2$

Amplitude: 3

Period: 2π

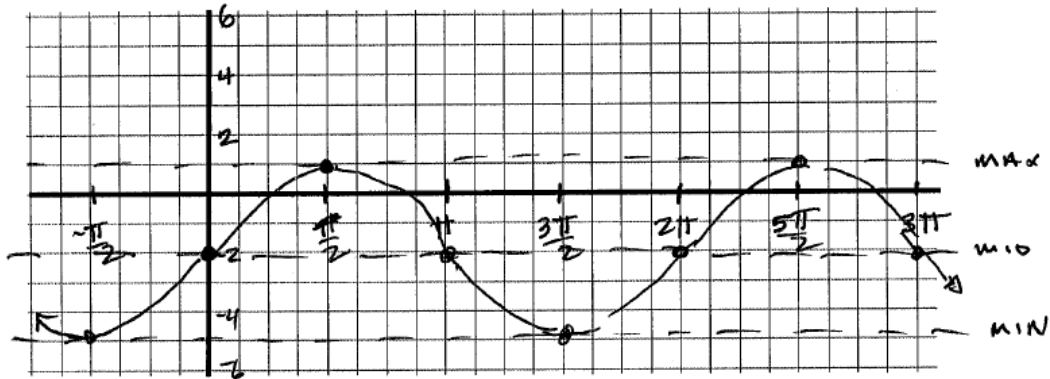
Vert. Shift: down 2

Increment: $\frac{\pi}{2}$

Scale $\frac{\pi}{8}$

Horizontal Shift: 0

Key Values: 0 $\frac{\pi}{2}$ π $\frac{3\pi}{2}$ 2π



2. Graph $f(\theta) = -4\cos\theta + 1$

Amplitude: -4

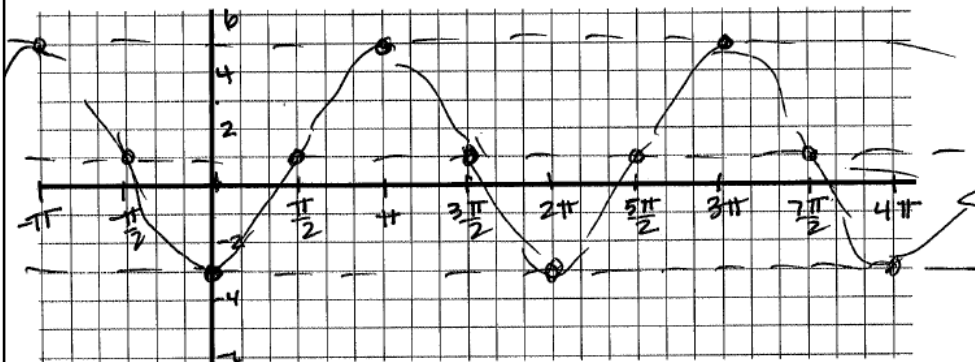
Period: 2π

Vert. Shift: up 1

Increment: $\frac{\pi}{2}$

Horizontal Shift: 0

Key Values: _____



3. $f(\theta) = 2\cos\theta - 3$

Amplitude: 2

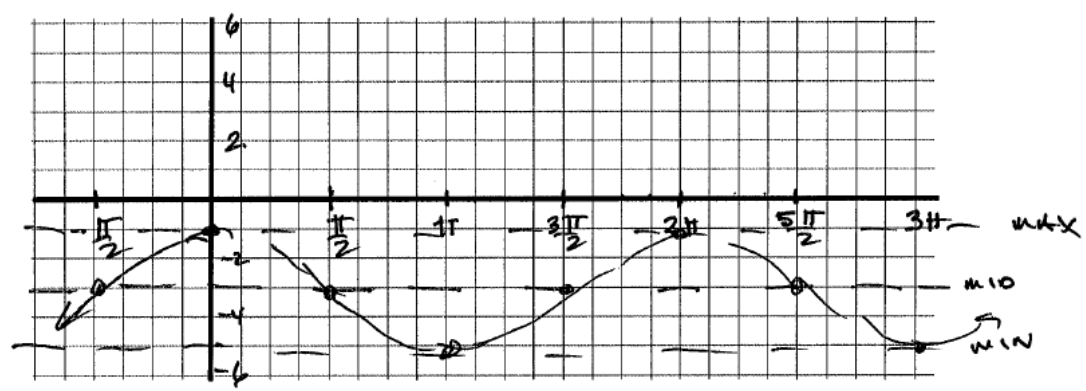
Period: 2π

Vert. Shift: down 3

Increment: $\pi/2$

Horizontal Shift: 0

Key Values: _____



4. $f(\theta) = -\sin\theta + 2$

Amplitude: -1

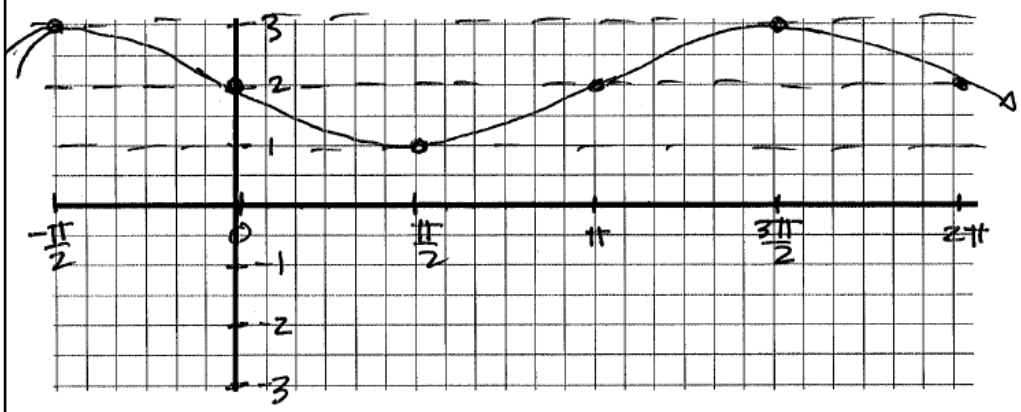
Period: 2π

Vert. Shift: up 2

Increment: $\pi/2$

Horizontal Shift: 0

Key Values: _____



Warm Up: Match each equation to its graph.

$f(\theta) = 3\sin\theta - 2$

UP 3
 $f(\theta) = \sin\theta + 3$

$f(\theta) = -3\cos\theta + 3$

UP 3
 $-3\cos\theta + 3$

$f(\theta) = 3\cos\theta$

UP 3

$f(\theta) = \sin\theta + 3$

UP 3

UP 0
 $3\cos\theta$

DOWN 2
 $\sin\theta - 2$

Example #1: Graph $f(\theta) = \cos 2\theta$

Amplitude: 1 Period: $\frac{2\pi}{\text{coef}} = \frac{2\pi}{2} = \pi$

Vert. Shift: 0 Increment: $\frac{\pi}{4}$

Horizontal Shift: 0 Key Values: $0, \frac{\pi}{4}, \frac{2\pi}{4}, \frac{3\pi}{4}, \frac{4\pi}{4}$

Example #2: Graph $f(\theta) = -\sin 4\theta$

Amplitude: -1

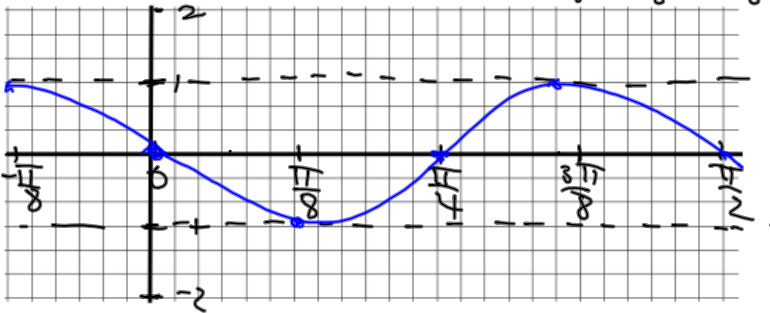
Period: $\frac{2\pi}{4} = \frac{\pi}{2}$

Vert. Shift: 0

Increment: $\frac{\pi}{2} \cdot \frac{1}{4} = \frac{\pi}{8}$

Horizontal Shift: 0

Key Values: 0 $\frac{\pi}{8}$ $\frac{2\pi}{8}$ $\frac{3\pi}{8}$ $\frac{4\pi}{8}$



Example #3: Graph $f(\theta) = \sin\left(\theta - \frac{\pi}{4}\right)$

Amplitude: 1

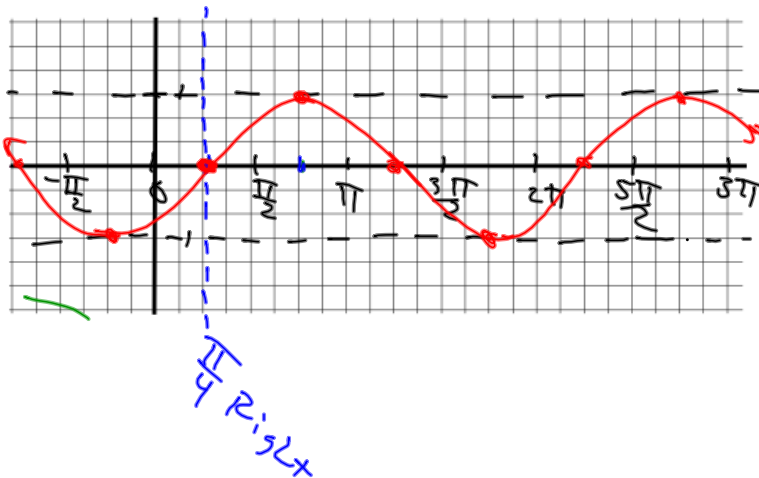
Period: 2π

Vert. Shift: 0

Increment: $\pi/2$

Horizontal Shift: $\frac{\pi}{4}$ Right

Key Values: 0 $\frac{\pi}{2}$ π $\frac{3\pi}{2}$ 2π



Example #4: Graph $f(\theta) = 3\cos 2\left(\theta + \frac{\pi}{6}\right) = 3\cos\left(2\left(\theta + \frac{\pi}{6}\right)\right)$

Amplitude: 3

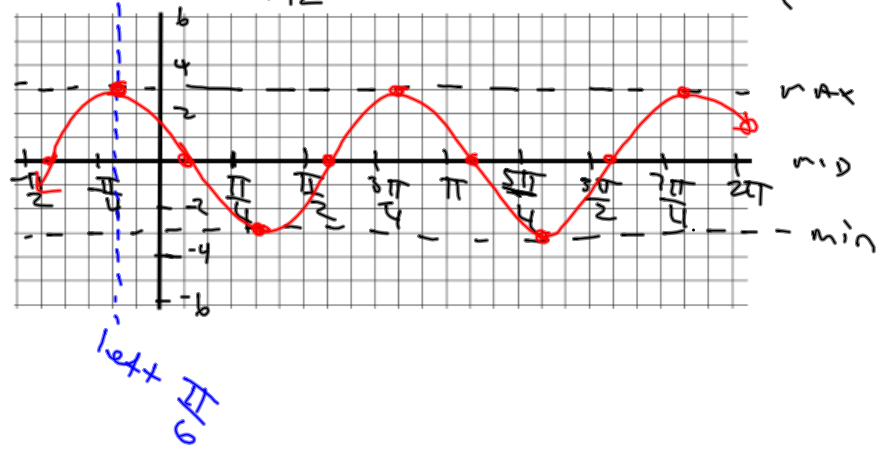
Period: $\frac{2\pi}{2} = \pi$

Vert. Shift: 0

Increment: $\frac{\pi}{4} = -\frac{3\pi}{12}$

Horizontal Shift: $\frac{\pi}{6}$ left
 $\frac{2\pi}{12}$

Key Values: $0 \quad \frac{\pi}{4} \quad \frac{\pi}{2} \quad \frac{3\pi}{4} \quad \pi$



Example #5: Graph $f(\theta) = \sin(3\theta - \pi) = f(\theta) = \sin\left(3\left(\theta - \frac{\pi}{3}\right)\right)$

Amplitude: 1

Period: $\frac{2\pi}{3}$

Vert. Shift: 0

Increment: $\frac{2\pi}{3} \cdot \frac{1}{4} = \frac{2\pi}{12} = \frac{\pi}{6}$

Horizontal Shift: $\frac{\pi}{3}$ right

Key Values: $0 \quad \frac{\pi}{6} \quad \frac{2\pi}{6} \quad \frac{3\pi}{6} \quad \frac{4\pi}{6}$

