

$$y = a \sin(b\theta) \quad y = a \cos(b\theta) \quad \frac{2\pi}{b} = \text{period} \quad | \quad I = \frac{1}{4} P$$

2.03 Worksheet: Graphing Sine & Cosine with Amplitude & Period

Date: _____

State the amplitude and period for each function.

1. $y = -\frac{2}{5} \sin 9\theta$
 $a = \frac{2}{5}$ period: $\frac{2\pi}{9}$

2. $y = \frac{2}{3} \cos \frac{3}{7}\theta$
 $a = \frac{2}{3}$ $p = \frac{14\pi}{3}$

3. $y = -2.5 \cos \frac{\theta}{5}$ $y = -2.5 \cos \frac{1}{5}\theta$
 $a = 2.5$ $p = 10\pi$

4. $y = \frac{1}{3} \sin \frac{\theta}{3}$
 $a = \frac{1}{3}$ $p = 6\pi$

Write an equation of the sine function with each amplitude and period.

5. amplitude = 3, period = $\frac{\pi}{6}$

6. amplitude = 6, period = 3π

$a = 3$ $b\pi = 12\pi$
 $\frac{2\pi}{b} = \frac{\pi}{6}$ $b = 12$
 $y = \pm 3 \sin(12\theta)$

$y = 6 \sin(\frac{2}{3}\theta)$ $y = \pm 6 \sin(\frac{2}{3}\theta)$

7. amplitude = 2, period = 10π

8. amplitude = 5, period = 7π $7\pi = \frac{2\pi}{b}$
 $b = \frac{2}{7}$

$p = \frac{2\pi}{b}$ $10\pi = \frac{2\pi}{b} \rightarrow 10\pi b = 2\pi \rightarrow b = \frac{2\pi}{10\pi} = \frac{1}{5}$
 $y = \pm 2 \sin(\frac{1}{5}\theta)$

$y = \pm 5 \sin \frac{2}{7}\theta$

9. amplitude = 4, period = 8π

10. amplitude = $\frac{3}{5}$, period = $\frac{\pi}{3}$ $p = \frac{2\pi}{b}$
 $\frac{\pi}{3} = \frac{2\pi}{b}$
 $b = 6$

$p = \frac{2\pi}{b} \rightarrow 8\pi = \frac{2\pi}{b} \rightarrow b = \frac{1}{4}$
 $y = \pm 4 \sin(\frac{1}{4}\theta)$

$y = \pm \frac{3}{5} \sin 6\theta$

Write an equation of the cosine function with each amplitude and period.

11. amplitude = $\frac{1}{2}$, period = 2π $b = 1$

12. amplitude = 7, period = 4π $b = \frac{1}{2}$

$y = \pm \frac{1}{2} \cos \theta$

$y = \pm 7 \cos(\frac{1}{2}\theta)$

13. amplitude = $\frac{2}{3}$, period = 6π $b = \frac{1}{3}$

14. amplitude = $\frac{1}{4}$, period = $\frac{8\pi}{3}$ $b = \frac{3}{4}$

$y = \pm \frac{2}{3} \cos(\frac{1}{3}\theta)$

$y = \pm \frac{1}{4} \cos(\frac{3}{4}\theta)$

15. amplitude = 6, period = $\frac{\pi}{4}$ $b = 8$

16. amplitude = 11, period = $\frac{\pi}{2}$ $b = 4$

$y = \pm 6 \cos(8\theta)$

$y = \pm 11 \cos(4\theta)$

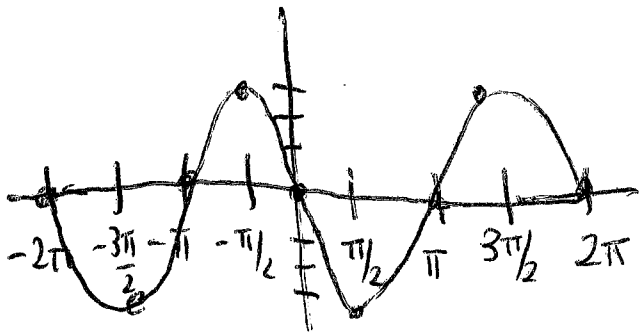
State the amplitude and period of each function. Then graph at least one period of the function.

17. $y = -3 \sin \theta$

Amplitude: 3

Period: 2π

	0	$\pi/2$	π	$3\pi/2$	2π
$\sin \theta$	0	1	0	-1	0
$-3 \sin \theta$	0	-3	0	3	0



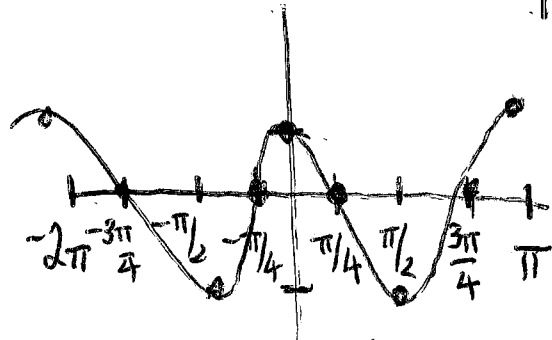
$p = \frac{2\pi}{b} = \frac{2\pi}{2} = \pi$

18. $y = \cos 2\theta$

Amplitude: 1

Period: π Interval = $\frac{\pi}{4}$

	0	$\pi/4$	$\pi/2$	$3\pi/4$	π
$\cos \theta$	1	$\frac{\sqrt{2}}{2}$	0	$-\frac{\sqrt{2}}{2}$	-1
$\cos 2\theta$	1	0	-1	0	1

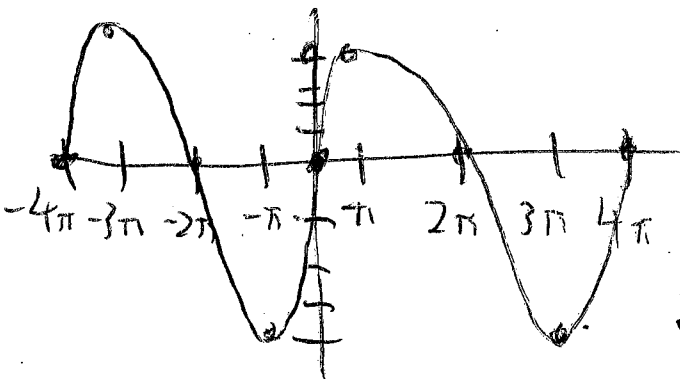


19. $y = 4 \sin \frac{\theta}{2}$

Amplitude: 4 $I = P \cdot \frac{1}{4}$

Period: $\frac{2\pi}{1/2} = 4\pi$ $I = \frac{P}{4} = \pi$

	0	π	2π	3π	4π
$y = \sin \frac{\theta}{2}$	0	1	0	-1	0
$y = 4 \sin \frac{\theta}{2}$	0	4	0	-4	0



20. $y = -\frac{1}{2} \cos 3\theta$

Amplitude: $\frac{1}{2}$

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

$p = \frac{2\pi}{3}$ $I = \frac{1}{4}P$
 $I = \frac{1}{4} \cdot \frac{2\pi}{3} = \frac{\pi}{6}$

	0	$\pi/6$	$\pi/3$	$\pi/2$	$\frac{2\pi}{3}$
$y = \cos 3\theta$	1	0	-1	0	1
$y = -\frac{1}{2} \cos 3\theta$	$-\frac{1}{2}$	0	$\frac{1}{2}$	0	$-\frac{1}{2}$

