

# 10.1

## SM3 Graphing sine and cosine #1

52 pt

Name \_\_\_\_\_ Date Key Period Key

Write the amplitude and vertical shift of the following without using a calculator.

2pt each

1.  $f(\theta) = 6 \sin \theta + 3$   
 $\begin{matrix} \text{A} \\ \uparrow \end{matrix}$

Amplitude 6  
 Vertical Shift up 3

2.  $f(\theta) = \frac{1}{8} \cos \theta + 0$  Amplitude  $\frac{1}{8}$   
 Vertical Shift 0

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

Amplitude 1  
 Vertical Shift down 2

4.  $f(\theta) = 1 \cos \theta + 0$  Amplitude 1  
 Vertical Shift 0

5.  $f(\theta) = \frac{1}{4} \sin \theta - \frac{3}{5}$   
 $\downarrow$

Amplitude  $\frac{1}{4}$   
 Vertical Shift down  $\frac{3}{5}$

6.  $f(\theta) = 2 - 8 \cos \theta$  Amplitude 8  
 $-8 \cos \theta + 2 \uparrow$  Vertical Shift up 2

7.  $f(\theta) = 3 - 2 \cos \theta$  Amplitude 2  
 $-2 \cos \theta + 3 \uparrow$  Vertical Shift up 3

8.  $f(\theta) = 5 - \sin \theta$  Amplitude 1  
 $-\sin \theta + 5 \uparrow$  Vertical Shift up 5

Find the vertical shift and amplitude. Then graph at least 1 period without a calculator, label 5 key points.

9.  $f(\theta) = \sin \theta + 1$   $\uparrow$

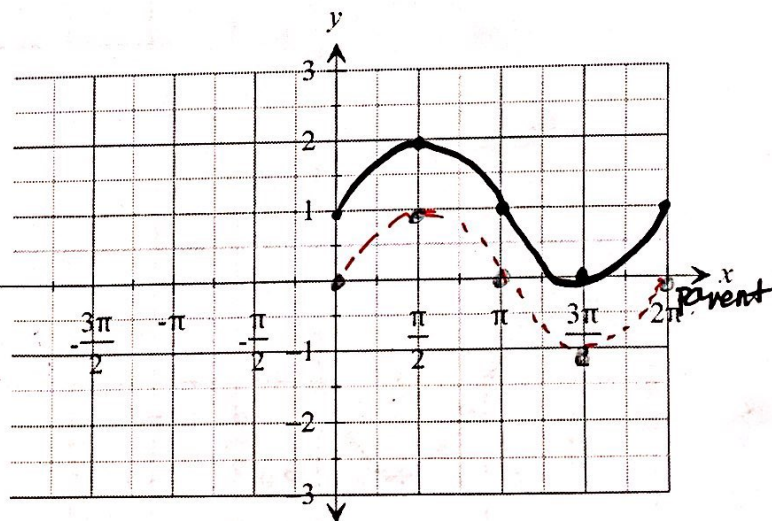
Vertical shift 1

Amplitude 1

4pt

Parent $x$	0	$\frac{\pi}{2}$	$\pi$	$\frac{3\pi}{2}$	$2\pi$
$\theta$	0	$\frac{\pi}{2}$	$\pi$	$\frac{3\pi}{2}$	$2\pi$
$y = \sin \theta$	0	1	0	-1	0
Parent $y$	0	1	0	-1	0

Parent  $y$   
 add 1  
 $y+1$



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

4pt each

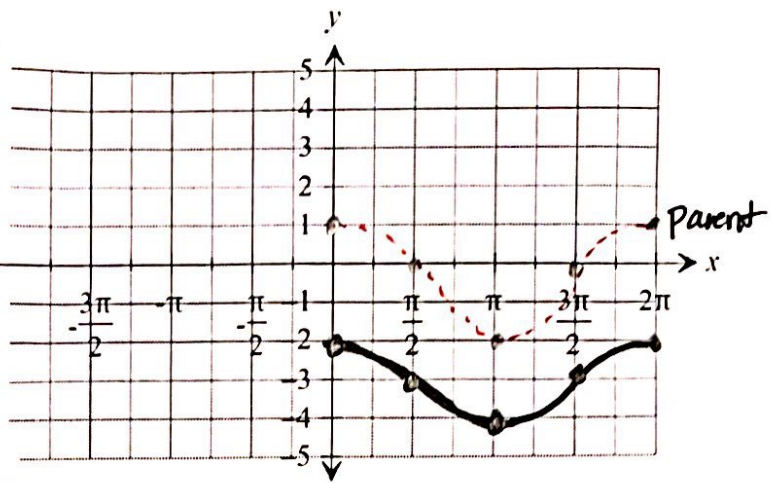
Vertical shift down 3

Amplitude 1

graph

Parent X	0	$\pi/2$	$\pi$	$3\pi/2$	$2\pi$
$\theta$	0	$\pi/2$	$\pi$	$3\pi/2$	$2\pi$
$y = \cos \theta$	-2	-3	-4	-3	-2
Parent y	1	0	-1	0	1

subtract 3  
y-3



11.  $f(\theta) = 2 + \sin \theta$

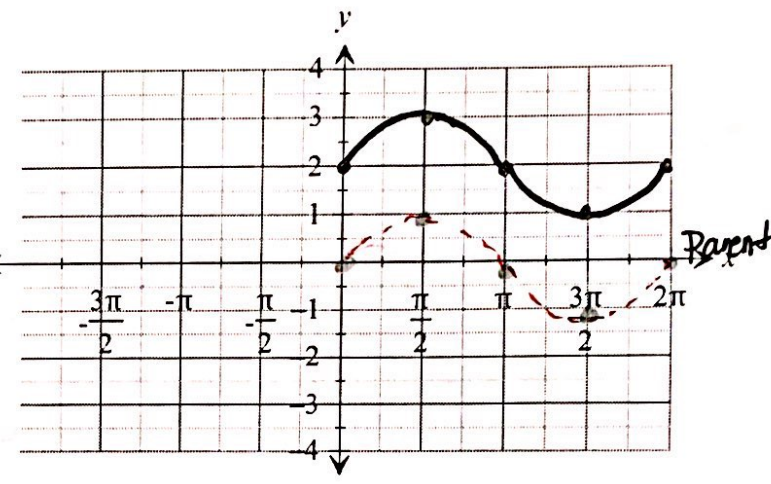
Vertical shift 2 up

Amplitude 1

graph

Parent X	0	$\pi/2$	$\pi$	$3\pi/2$	$2\pi$
$\theta$	0	$\pi/2$	$\pi$	$3\pi/2$	$2\pi$
$y = \sin \theta$	2	3	2	1	2
Parent y	0	1	0	-1	0

up 2  
+2



12.  $f(\theta) = 2 \cos \theta$

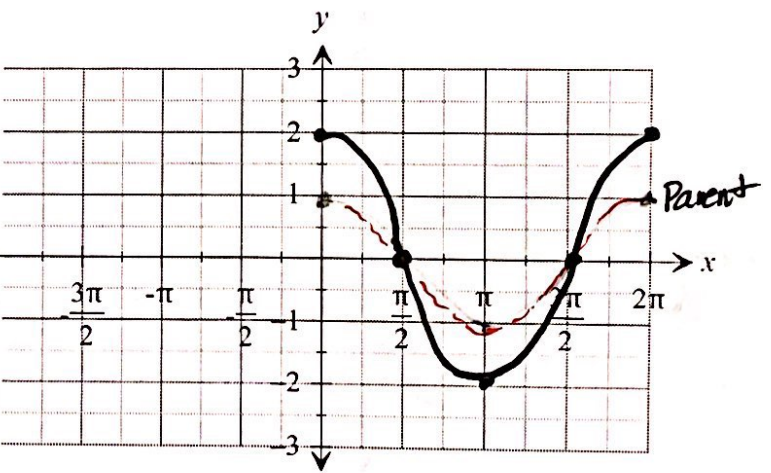
Vertical shift 0

Amplitude 2

graph

Parent X	0	$\pi/2$	$\pi$	$3\pi/2$	$2\pi$
$\theta$	0	$\pi/2$	$\pi$	$3\pi/2$	$2\pi$
$y = \cos \theta$	2	0	-2	0	2
Parent y	1	0	-1	0	1

mult by 2



13.  $f(\theta) = -\frac{1}{2} \sin \theta$

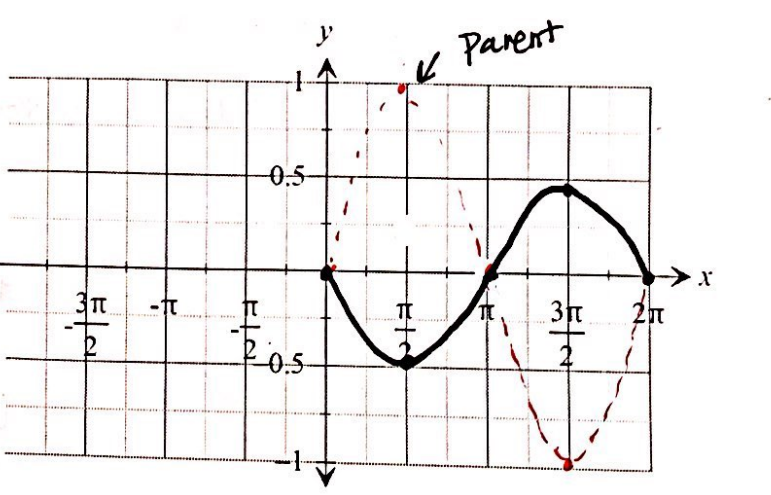
Vertical shift 0

Amplitude 1/2

graph

Parent X	0	$\pi/2$	$\pi$	$3\pi/2$	$2\pi$
$\theta$	0	$\pi/2$	$\pi$	$3\pi/2$	$2\pi$
$y = \sin \theta$	0	-1/2	0	1/2	0
Parent y	0	1	0	-1	0

mult. by -1/2



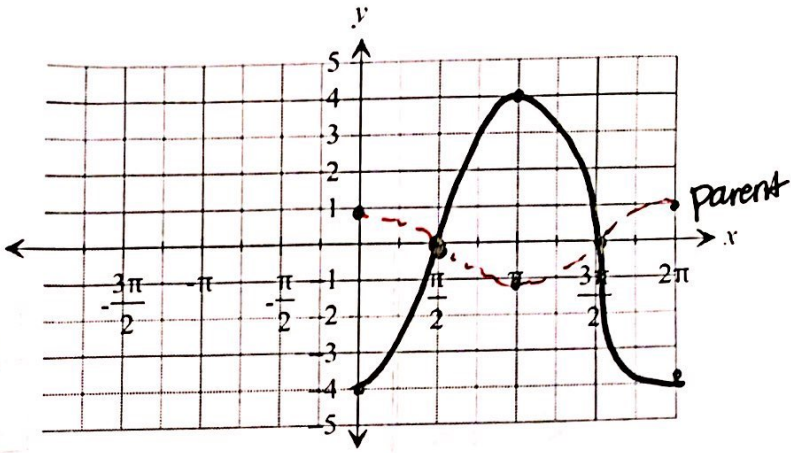
$$f(\theta) = -4 \cos \theta$$

Vertical shift 0

Amplitude 4

graph

Parent $x$	0	$\pi/2$	$\pi$	$3\pi/2$	$2\pi$
$\theta$	0	$\pi/2$	$\pi$	$3\pi/2$	$2\pi$
$y = \cos \theta$	-4	0	4	0	-4
Parent $y$	1	0	-1	0	1
mult. by					
-4					



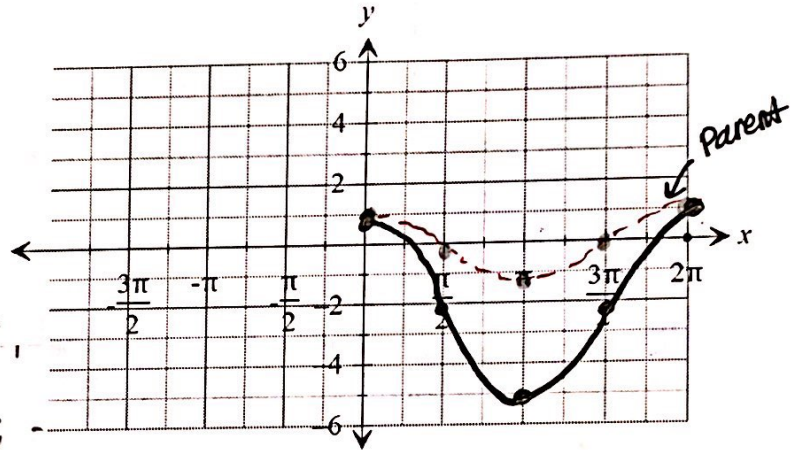
15.  $f(\theta) = 3 \cos(\theta) - 2$  ↓

Vertical shift ↓ down 2

Amplitude 3

graph

Parent $x$	0	$\pi/2$	$\pi$	$3\pi/2$	$2\pi$
$\theta$	0	$\pi/2$	$\pi$	$3\pi/2$	$2\pi$
$y = \cos \theta$	1	-2	-5	-2	1
Parent $y$	1	0	-1	0	1
mult. by					
+3					
subtract					
-2					



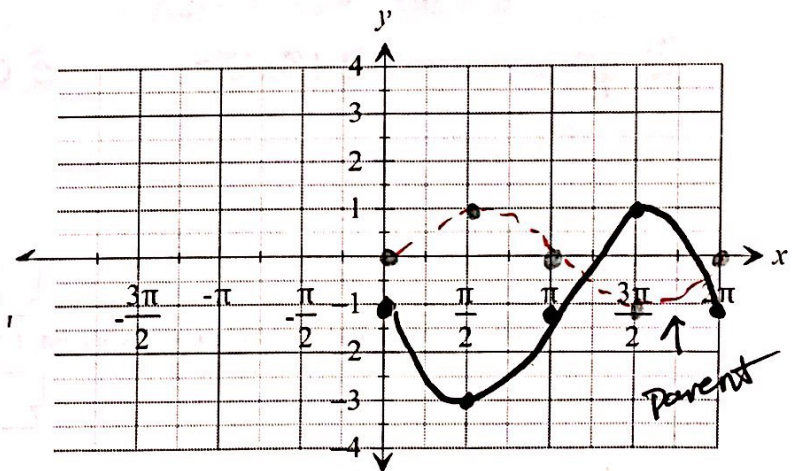
16.  $f(\theta) = -2 \sin \theta - 1$

Vertical shift down 1 ↓

Amplitude 2

graph

Parent $y$	0	$\pi/2$	$\pi$	$3\pi/2$	$2\pi$
$\theta$	0	$\pi/2$	$\pi$	$3\pi/2$	$2\pi$
$y = \sin \theta$	-1	-3	-1	1	-1
Parent $x$	1	0	1	-1	0
mult. by					
-2					
down					
1					



Write an equation for the sine curve that has the given amplitude and vertical shift.

17. Amplitude = 3 Vertical Shift = 7

$$f(x) = 3 \sin \theta + 7$$

18. Amplitude = 1 Vertical Shift = -3

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

19. Amplitude = 5 Vertical Shift =  $\frac{5}{6}$

$$f(x) = 5 \sin \theta + \frac{5}{6}$$

20. Amplitude = 1 Vertical Shift = 0

$$f(x) = \sin x$$