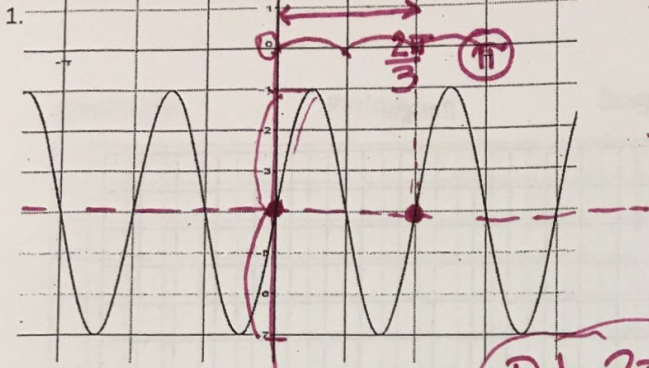


Writing Equations from Graphs  
Write the indicated equation for each graph.

$y = a \sin(bx) + d$



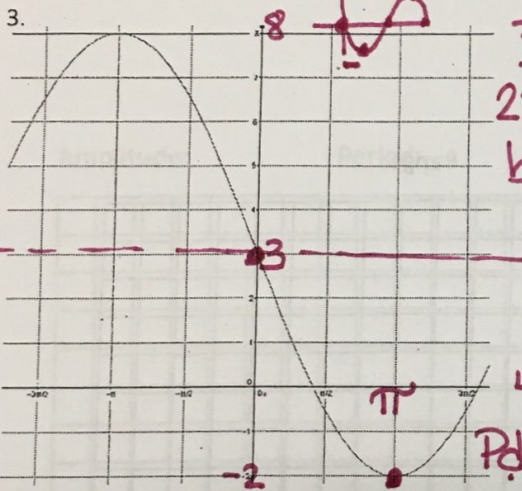
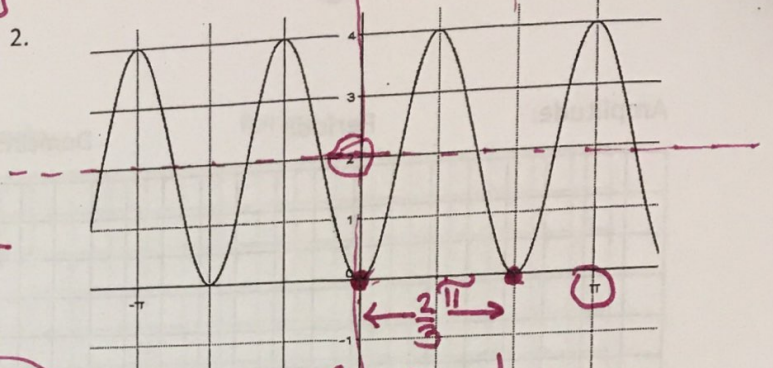
Write a sine equation.

$y = 3 \sin(3x) - 4$

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

Write a cosine equation.

$y = a \cos(bx) + d$   
 $y = -2 \cos(3x) + 2$

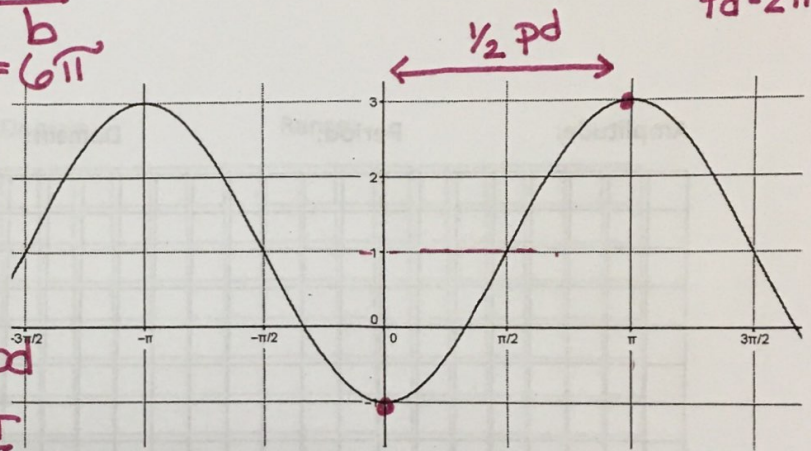


Write a sine equation.

$y = -5 \sin(\frac{1}{2}x) + 3$

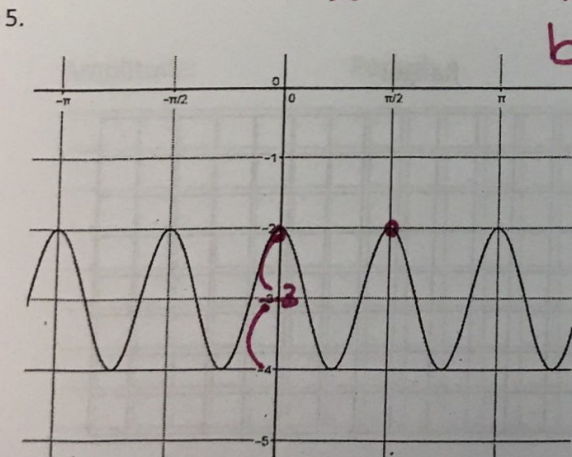
$\frac{2\pi}{3} = \frac{2\pi}{b}$   
 $2\pi b = 6\pi$   
 $b = 3$

$4\pi = Pd$   
 $Pd = \frac{2\pi}{b}$



Write a cosine equation.

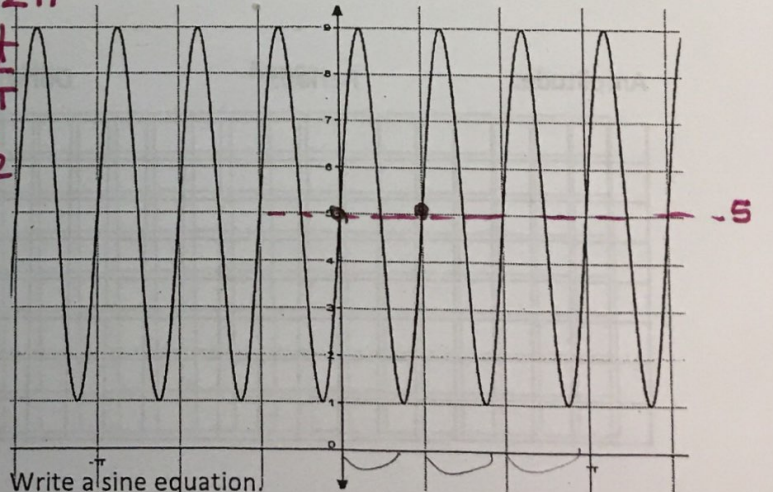
$y = -2 \cos(x) + 1$



Write a cosine equation.

$y = 1 \cos(4x) - 3$

$Pd = \frac{\pi}{2}$   
 $\frac{\pi}{2} = \frac{2\pi}{b}$   
 $b = 4$



Write a sine equation.

$\frac{\pi}{3} = \frac{2\pi}{b}$   
 $b = 6$   
 $y = 4 \sin(6x) + 5$

Review (part 1)

1. If each angle has the given measure and is in standard position, determine the quadrant in which its terminal side lies.

Q3 a.  $\frac{-5\pi}{6}$   
 $-150^\circ$

Q2 b.  $110^\circ$   
 $470^\circ$

2. Change each degree measure to radian measure in terms of  $\pi$ .

$\frac{4\pi}{9}$  a.  $80^\circ$

$\frac{19\pi}{12}$  b.  $285^\circ$

3. Change each radian measure to degrees.

$-60^\circ$  a.  $\frac{-\pi}{3}$

$320^\circ$  b.  $\frac{16\pi}{9}$

4. Write the word TRUE or the word FALSE. Determine whether the angles are coterminal.

False a.  $-215^\circ, 215^\circ$  True b.  $\frac{-5\pi}{3}, \frac{\pi}{3}$

5. Find the reference angle for each angle with the given measure.

$30^\circ$  a.  $390^\circ$

$\frac{\pi}{4}$  b.  $\frac{7\pi}{4}$

6. Identify the amplitude, period, phase shift, and vertical shift for each function.

a.  $y = -5\cos(3x) + 7$  A: 5 P:  $\frac{2\pi}{3}$  Vertical: up 7

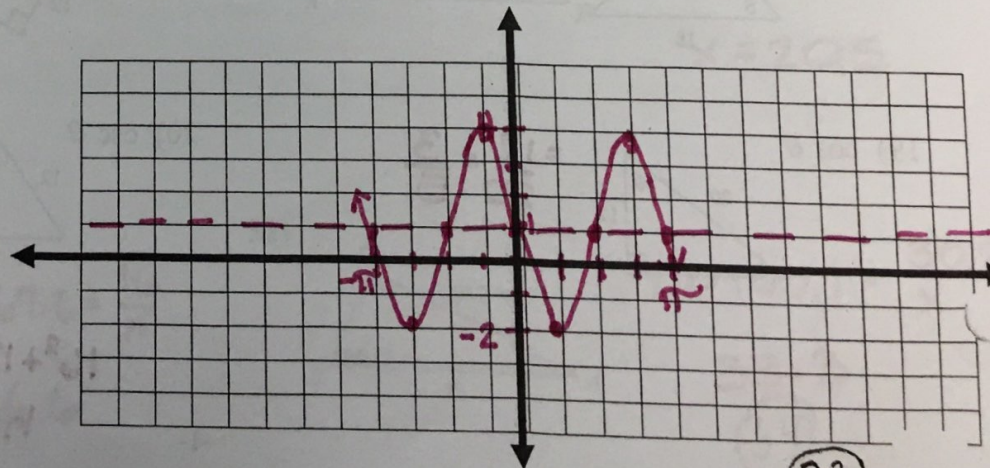
b.  $y = 6\sin(4x) - 13$  A: 6 P:  $\frac{\pi}{2}$  Vertical: Down 13

7. Graph  $y = -3\sin(2x) + 1$

A = 3

Period =  $\pi$

Vertical Shift = up 1



# Unit 3 Review - Modeling With Trigonometry

Date \_\_\_\_\_ Period \_\_\_\_\_

Convert each degree measure into radians and each radian measure into degrees.

1)  $\frac{25\pi}{6} \cdot \frac{180}{\pi} = 750^\circ$

2)  $480^\circ \cdot \frac{\pi}{180} = 8\pi/3$

3)  $-710^\circ = -\frac{71\pi}{18}$

4)  $105^\circ = 7\pi/12$

5)  $-\frac{107\pi}{18} = -1070^\circ$

6)  $-225^\circ = 5\pi/4$

7)  $-\frac{7\pi}{6} = -210^\circ$

8)  $\frac{4\pi}{3} = 240^\circ$

Find a positive and a negative coterminal angle for each given angle.

9)  $120^\circ = 480^\circ, -240^\circ$

10)  $-45^\circ = 315^\circ, -405^\circ$

11)  $270^\circ = 630^\circ, -90^\circ$

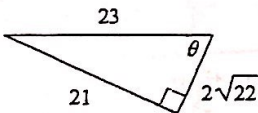
12)  $-\frac{\pi}{6} = 11\pi/6, -13\pi/6$

13)  $\frac{8\pi}{15} = \frac{38\pi}{15}, -\frac{22\pi}{15}$

14)  $-\frac{11\pi}{12} = \frac{13\pi}{12}, -\frac{35\pi}{12}$

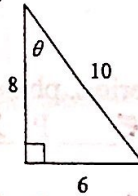
Find the value of the trig function indicated.

15)  $\sin \theta$



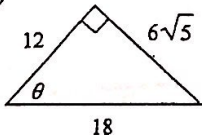
$= \frac{21}{23}$

16)  $\sec \theta$



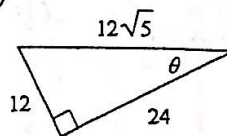
$= \frac{10}{8} = \frac{5}{4}$

17)  $\tan \theta$



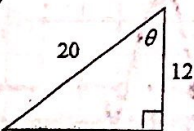
$= \frac{6\sqrt{5}}{12} = \frac{\sqrt{5}}{2}$

18)  $\cot \theta$



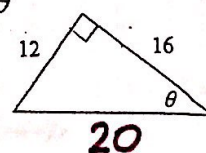
$= \frac{24}{12} = 2$

19)  $\cos \theta$



$= \frac{12}{20} = \frac{3}{5}$

20)  $\csc \theta$

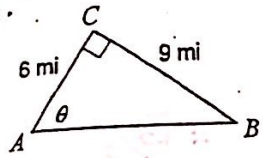


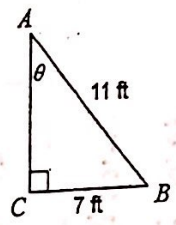
$= \frac{20}{12} = \frac{5}{3}$

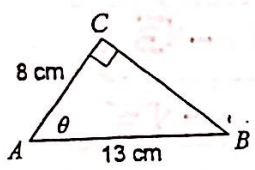
$16^2 + 12^2 = h^2$

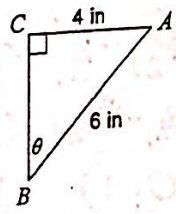
$h = 20$

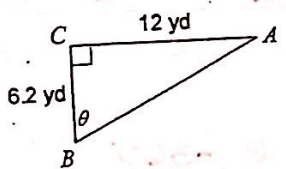
Find the measure of each angle indicated. Round to the nearest tenth.

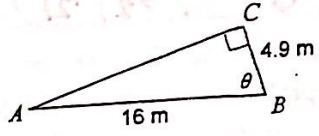
21)   $\tan \theta = \frac{9}{6}$   
 $56.3^\circ$

22)   $39.5^\circ$

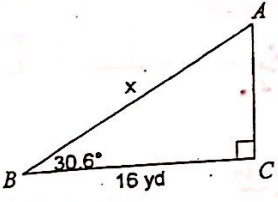
23)   $= 52.0^\circ$

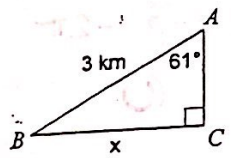
24)   $= 41.8^\circ$

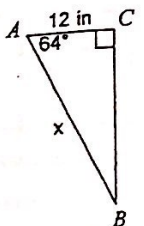
25)   $62.7^\circ$

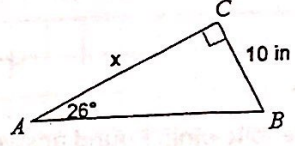
26)   $= 72.2^\circ$

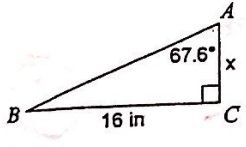
Find the measure of each side indicated. Round to the nearest tenth.

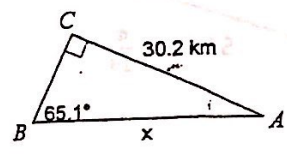
27)   $\cos 30.6 = \frac{16}{x}$   
 $x = 18.6$

28)   $\sin 61 = \frac{x}{3}$   
 $x = 2.6$

29)   $\cos 64 = \frac{12}{x}$   
 $27.4$

30)   $\tan 26 = \frac{10}{x}$   
 $x = 20.5$

31)   $\tan 67.6 = \frac{16}{x}$   
 $x = 6.6$

32)   $\sin 65.1 = \frac{30.2}{x}$   
 $33.3$   
 (34)

57.  $y = \sin 3\theta$

33. Complete the chart.

Degrees	Radians	(x, y)	Quadrant	sin $\theta$	cos $\theta$	tan $\theta$
30°	$\frac{\pi}{6}$	$(\frac{\sqrt{3}}{2}, \frac{1}{2})$	Q1	$\frac{1}{2}$	$\frac{\sqrt{3}}{2}$	$= \frac{\sqrt{3}}{3}$
120°	$\frac{2\pi}{3}$	$(-\frac{1}{2}, \frac{\sqrt{3}}{2})$	Q2	$\frac{\sqrt{3}}{2}$	$-\frac{1}{2}$	$-\sqrt{3}$
225°	$\frac{5\pi}{4}$	$(-\frac{\sqrt{2}}{2}, -\frac{\sqrt{2}}{2})$	Q3	$-\frac{\sqrt{2}}{2}$	$-\frac{\sqrt{2}}{2}$	1
330°	$11\pi/6$	$(\frac{\sqrt{3}}{2}, -\frac{1}{2})$	Q4	$-\frac{1}{2}$	$\frac{\sqrt{3}}{2}$	$-\frac{\sqrt{3}}{3}$
-60°	$-\frac{\pi}{3}$	$(\frac{1}{2}, -\frac{\sqrt{3}}{2})$	Q4	$-\frac{\sqrt{3}}{2}$	$\frac{1}{2}$	$-\sqrt{3}$
90°	$\pi/2$	(0, 1)	Axis	1	0	Undefined
-540	$-3\pi$	(-1, 0)	Axis	0	-1	0
210°	$7\pi/6$	$(-\frac{\sqrt{3}}{2}, -\frac{1}{2})$	Q3	$-\frac{1}{2}$	$-\frac{\sqrt{3}}{2}$	$-\frac{\sqrt{3}}{3}$

Solve the following problems using your Unit Circle (exact values, no decimals).

34.  $\cos \frac{7\pi}{4}$

$\frac{\sqrt{2}}{2}$

35.  $\sin -30^\circ$

$-\frac{1}{2}$

36.  $\tan \frac{-2\pi}{3}$

$-\frac{\sqrt{3}}{2}$

37.  $\cos 600^\circ$

$-\frac{1}{2}$

$-360^\circ$

38.  $\sin \frac{9\pi}{2} - 2\pi$

1

39.  $\tan 7\pi - 2\pi$

0

40.  $\cos \frac{-11\pi}{4}$

$-\frac{\sqrt{2}}{2}$

41.  $\sin -225^\circ$

$\frac{\sqrt{2}}{2}$

42.  $\tan 585^\circ$

1

43.  $\cos 1440^\circ$

1

44.  $\sin \frac{-13\pi}{4}$

$\frac{\sqrt{2}}{2}$

45.  $\cos \frac{23\pi}{6}$

$\frac{\sqrt{3}}{2}$

Evaluate each of the following. Round answers to the thousandth (3 decimal places).

46.  $\sin 19^\circ$

47.  $\tan -13.7^\circ$

48.  $\cos \frac{4\pi}{15}$

49.  $\sin -\frac{9\pi}{7}$

50.  $\cos 345^\circ$

51.  $\tan \frac{\pi}{18}$

52.  $\tan 162$

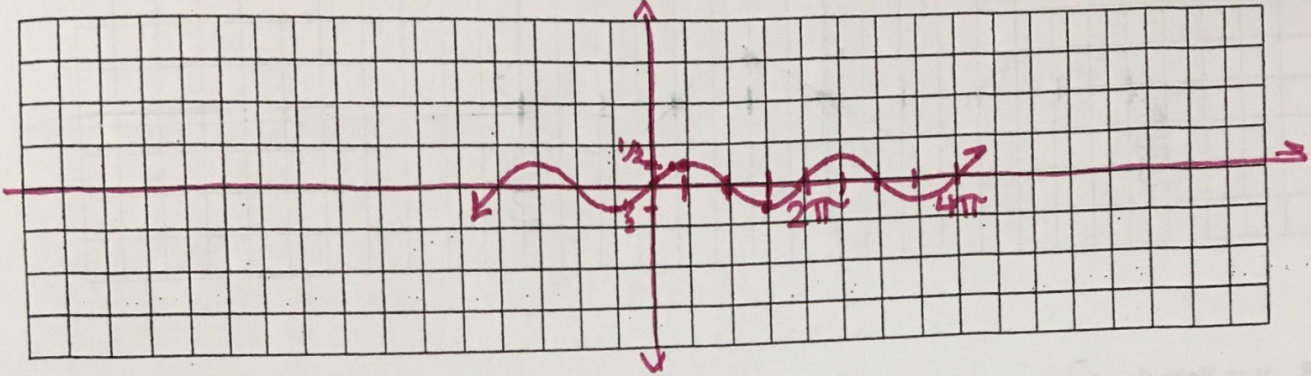
53.  $\sin 78$

35

Graph each of the following.

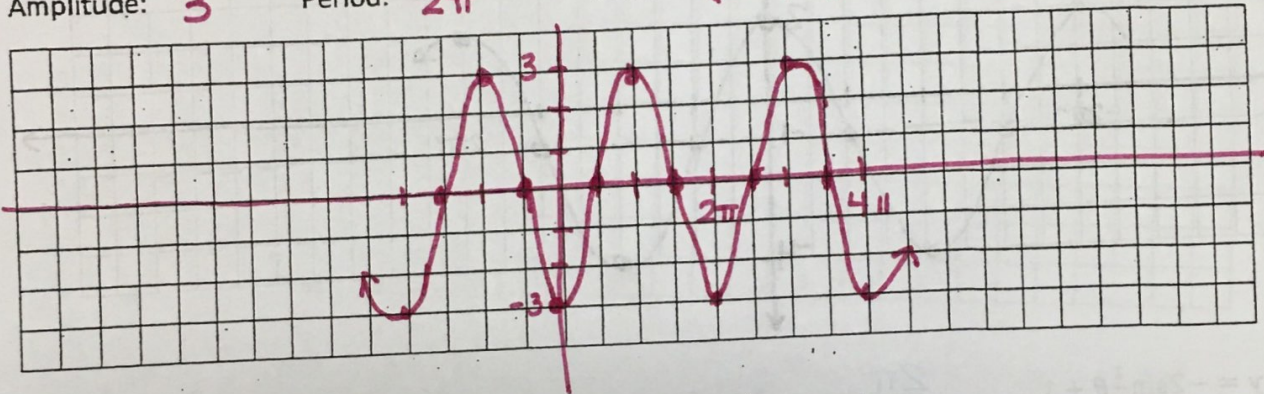
54.  $y = \frac{1}{2} \sin \theta$

Amplitude:  $\frac{1}{2}$     Period:  $2\pi$     Domain:  $(-\infty, \infty)$     Range:  $[-\frac{1}{2}, \frac{1}{2}]$     V.S.: none



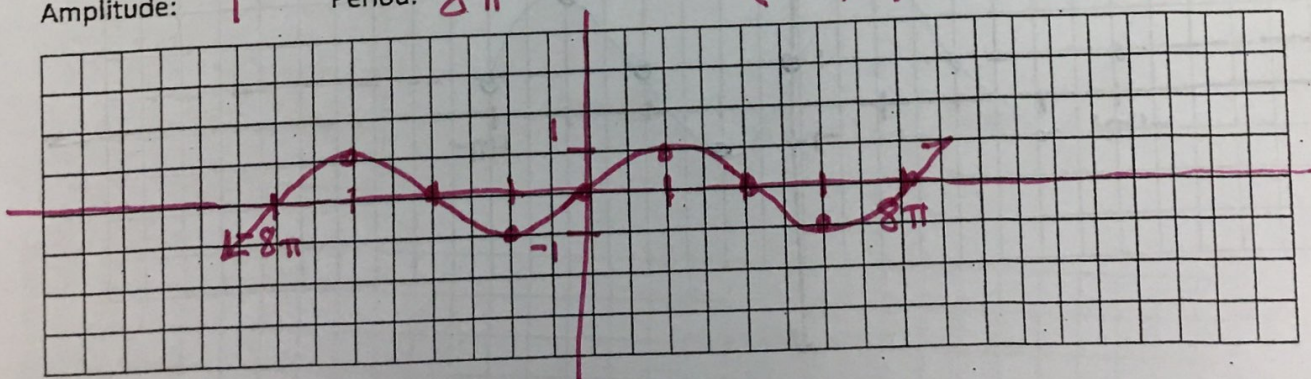
55.  $y = -3 \cos \theta$

Amplitude: 3    Period:  $2\pi$     Domain:  $(-\infty, \infty)$     Range:  $[-3, 3]$     V.S.: none



56.  $y = \sin \frac{\theta}{4}$

Amplitude: 1    Period:  $8\pi$     Domain:  $(-\infty, \infty)$     Range:  $[-1, 1]$     V.S.: none



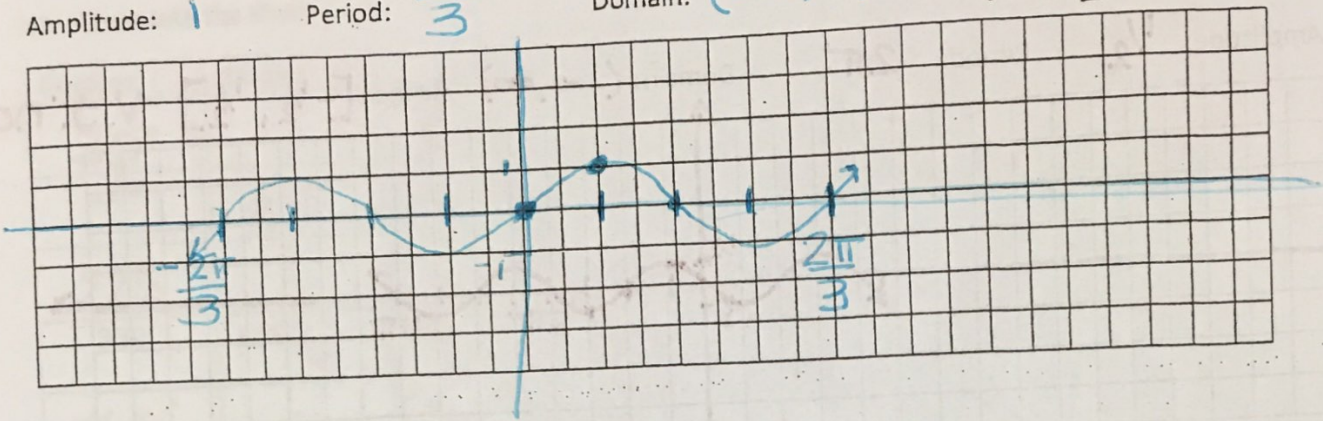
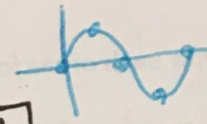
36

57.  $y = \sin 3\theta$

Amplitude: 1

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

Domain:  $(-\infty, \infty)$  Range:  $[-1, 1]$

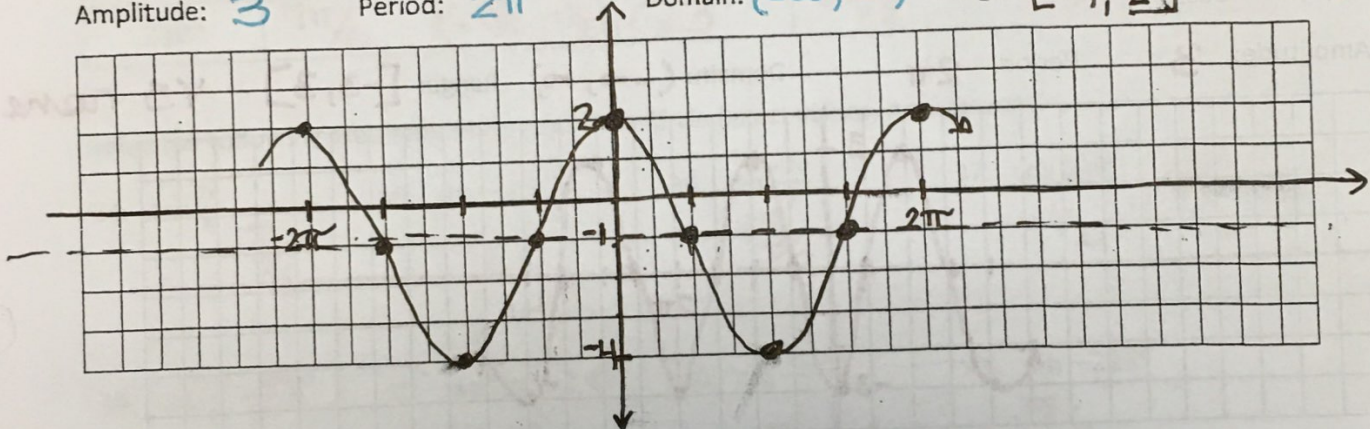
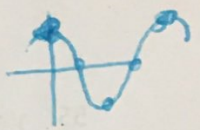


58.  $y = 3\cos\theta - 1$

Amplitude: 3

Period:  $2\pi$

Domain:  $(-\infty, \infty)$  Range:  $[-4, 2]$



59.  $y = -2\sin\frac{1}{2}\theta + 1$

Amplitude: 2

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

Domain:  $(-\infty, \infty)$  Range:

