

Unit 10 Review

Using radians, find the amplitude, frequency, and period of each function.

1) $y = 9\cos 7\theta$

$a = 9$

$b = 7$

$p = \frac{2\pi}{7}$

2) $y = 9\cos 3\theta$

$a = 9$

$b = 3$

$p = \frac{2\pi}{3}$

3) $y = 5\cos \theta$

$a = 5$

$b = 1$

$p = 2\pi$

4) $y = 8\sin 7\theta$

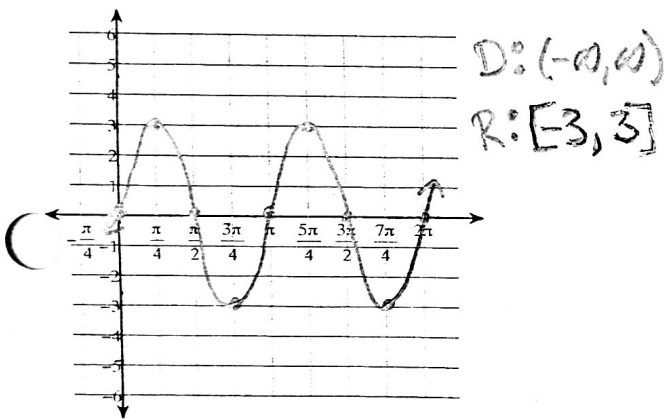
$a = 8$

$b = 7$

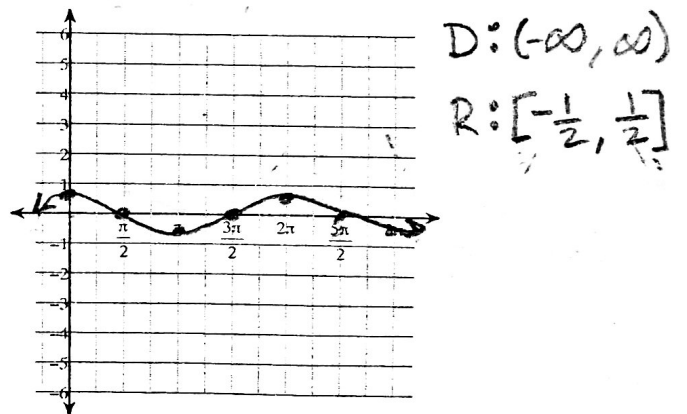
$p = \frac{2\pi}{7}$

Graph each function using radians. Then state the domain and range.

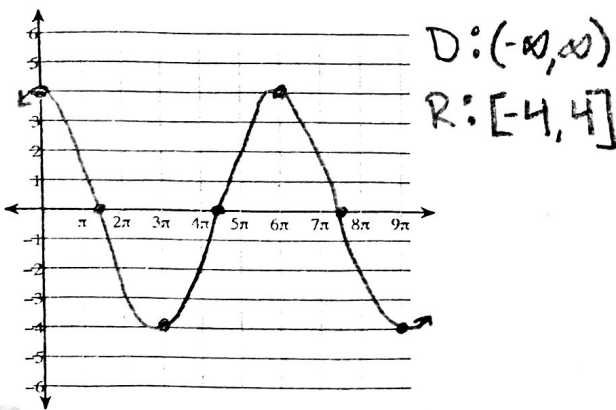
5) $y = 3\sin 2\theta$



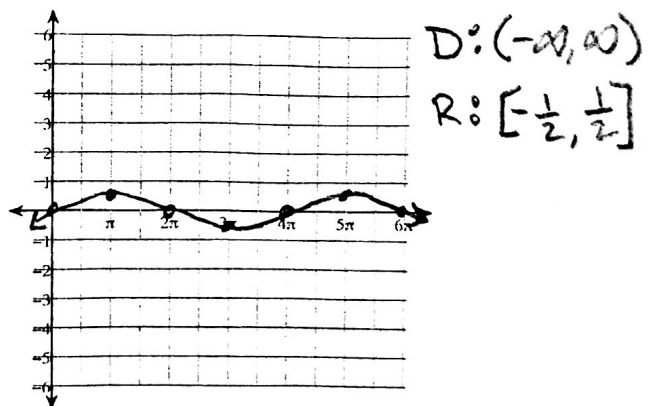
6) $y = \frac{1}{2} \cdot \cos \theta$



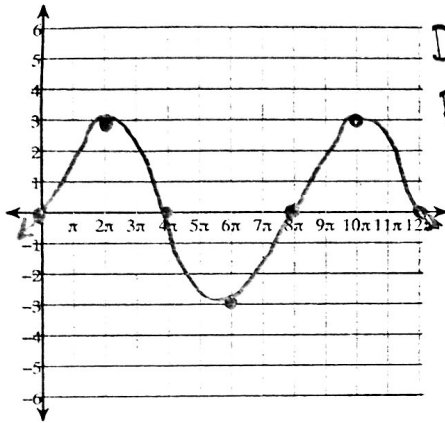
7) $y = 4\cos \frac{\theta}{3}$



8) $y = \frac{1}{2} \cdot \sin \frac{\theta}{2}$

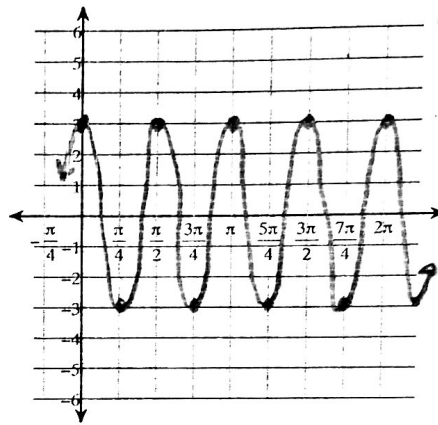


9) $y = 3\sin \frac{\theta}{4}$



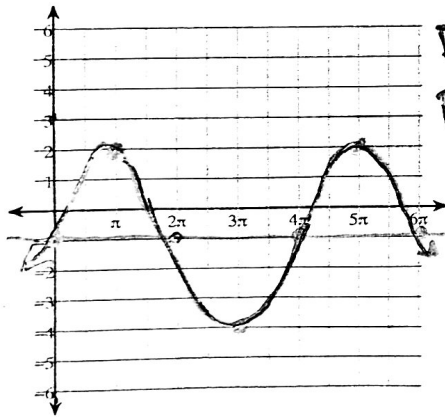
$D: (-\infty, \infty)$
 $R: [-3, 3]$

10) $y = 3\cos 4\theta$



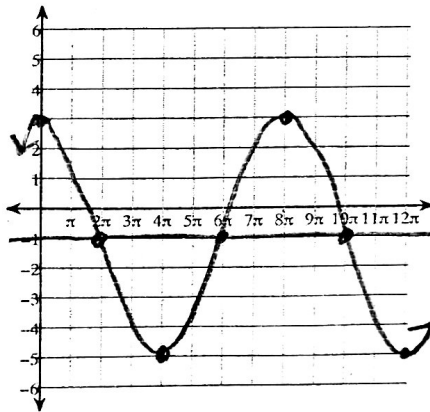
$D: (-\infty, \infty)$
 $R: [-3, 3]$

11) $y = -1 + 3\sin \frac{\theta}{2}$



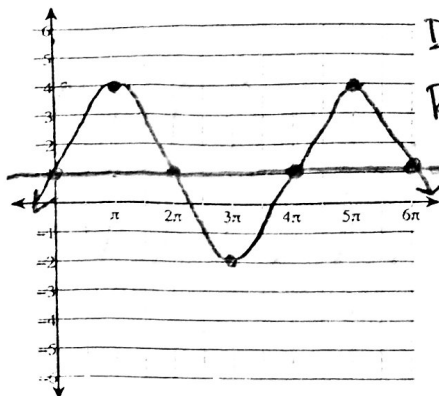
$D: (-\infty, \infty)$
 $R: [-4, 2]$

12) $y = 4\cos \frac{\theta}{4} - 1$



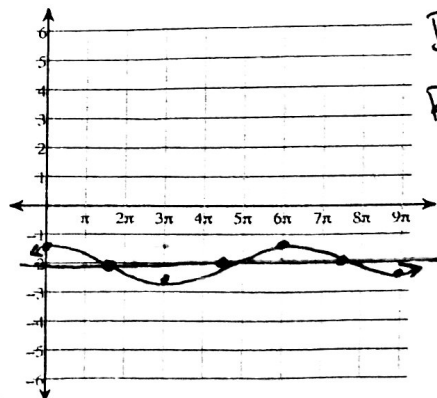
$D: (-\infty, \infty)$
 $R: [-5, 3]$

13) $y = 3\sin \frac{\theta}{2} + 1$



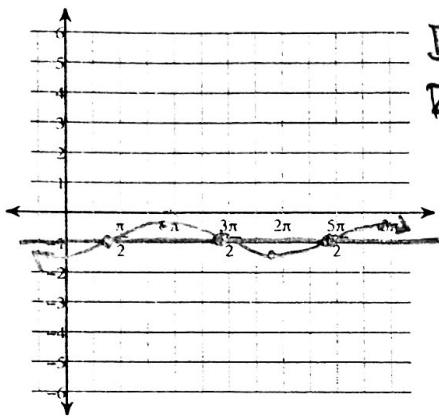
$D: (-\infty, \infty)$
 $R: [-2, 4]$

14) $y = -2 + \frac{1}{2} \cdot \cos \frac{\theta}{3}$



$D: (-\infty, \infty)$
 $R: [-2.5, -1.5]$

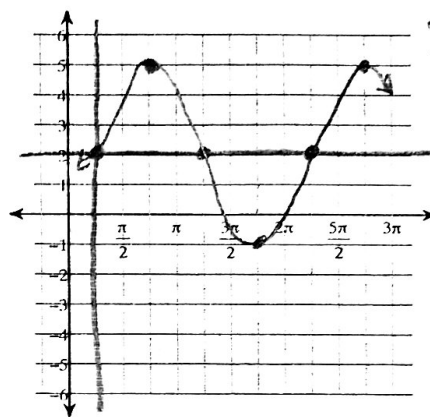
$$15) y = \frac{1}{2} \cdot \cos\left(\theta + \frac{5\pi}{6}\right) - 1$$



$$D: (-\infty, \infty)$$

$$R: [-1.5, -0.5]$$

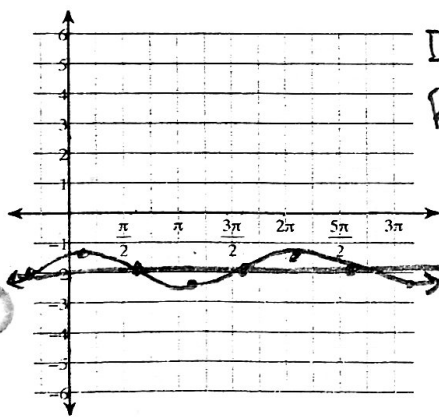
$$16) y = 3\sin\left(\theta - \frac{\pi}{4}\right) + 2$$



$$D: (-\infty, \infty)$$

$$R: [1, 5]$$

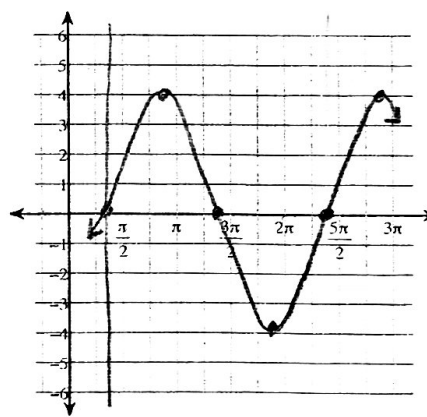
$$17) y = \frac{1}{2} \cdot \sin\left(\theta + \frac{2\pi}{3}\right) - 2$$



$$D: (-\infty, \infty)$$

$$R: [-2.5, -1.5]$$

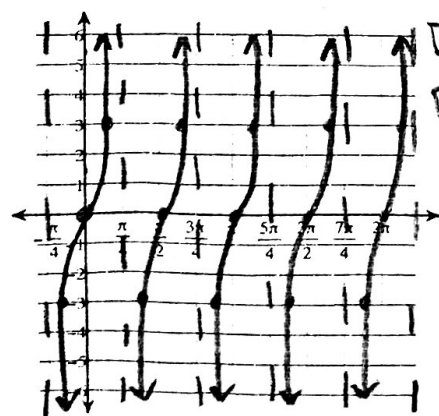
$$18) y = 4\sin\left(\theta - \frac{\pi}{3}\right)$$



$$D: (-\infty, \infty)$$

$$R: [-4, 4]$$

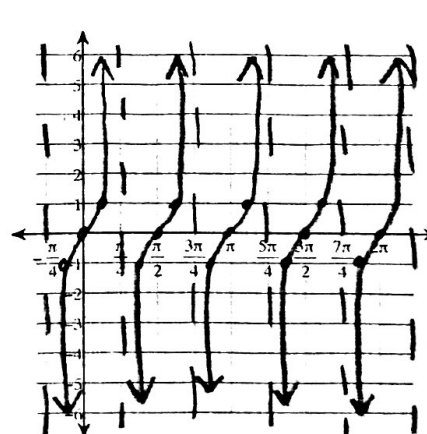
$$19) y = 3\tan 2\theta$$



$$D: x \neq \frac{\pi}{4} + \frac{\pi}{2}n$$

$$R: (-\infty, \infty)$$

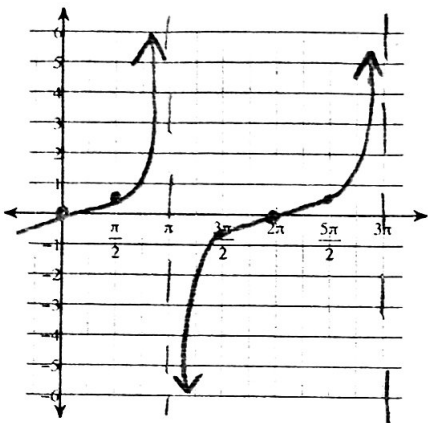
$$20) y = \tan 2\theta$$



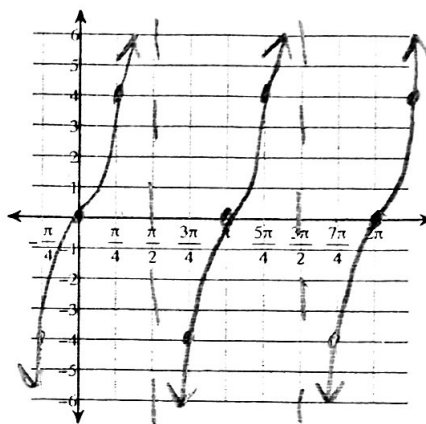
$$D: x \neq \frac{\pi}{4} + \frac{\pi}{2}n$$

$$R: (-\infty, \infty)$$

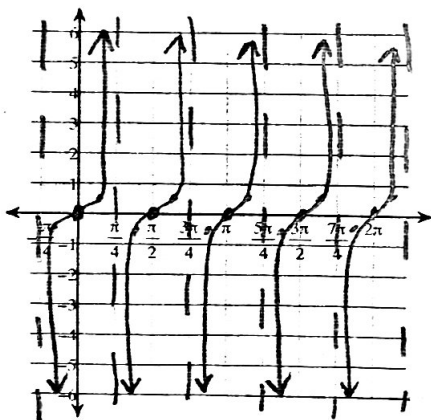
21) $y = \frac{1}{2} \cdot \tan \frac{\theta}{2}$



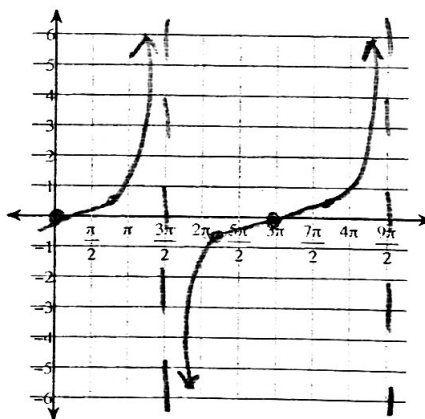
22) $y = 4 \tan \theta$



23) $y = \frac{1}{2} \cdot \tan 2\theta$



24) $y = \frac{1}{2} \cdot \tan \frac{\theta}{3}$



25) What does the graph of $y = \sin x$ represent?

y-values of the unit circle

26) What does the graph of $y = \cos x$ represent?

x-values of the unit circle

Write the transformations for each functions.

27) $y = 4 \cos \left(\theta - \frac{2\pi}{3} \right)$

*Vertical stretch of 4
Horizontal shift right $\frac{2\pi}{3}$*

28) $y = 9 \cos \left(\theta - \frac{3\pi}{2} \right)$

*Vertical stretch of 9
Horizontal shift right $\frac{3\pi}{2}$*

29) $y = 9 \cos 7\theta + 4$

*Vertical stretch of 9
Horizontal stretch of 7 (frequency)
Vertical shift up 4*

30) $y = -1 + 8 \cos 6\theta$

*Vertical shift down 1
Vertical stretch of 8
Horizontal stretch of 6 (frequency)*

Write an equation for each translation.

- 31) Cosine function
Vertical shift down 3
Phase shift $\pi/4$ to the left
Amplitude 2, $a > 0$

$$y = 2 \cos\left(x + \frac{\pi}{4}\right) - 3$$

- 32) Sine function
Period of π
Vertical shift 1 unit up
Amplitude of 5, $a < 0$

$$y = -5 \sin 2x + 1$$

Write 3 equivalent equations for each function. Be sure at least one is sine and one is cosine.

33) $y = 3 \sin \frac{\theta}{3}$

$$y = 3 \sin\left(\frac{\theta}{3} - 6\pi\right)$$

$$y = 3 \sin\left(\frac{\theta}{3} + 6\pi\right)$$

$$y = 3 \cos\left(\frac{\theta}{3}\pi - \frac{3\pi}{2}\right)$$

35) $y = \frac{1}{7} \cos 3\theta$

$$y = \frac{1}{7} \cos 3\left(\theta - \frac{2\pi}{3}\right)$$

$$y = \frac{1}{7} \cos 3\left(\theta + \frac{2\pi}{3}\right)$$

$$y = \frac{1}{7} \sin 3\left(\theta + \frac{\pi}{6}\right)$$

34) $y = 2 \sin 5\theta$

$$y = 2 \sin 5\left(\theta - \frac{2\pi}{5}\right)$$

$$y = 2 \sin 5\left(\theta + \frac{2\pi}{5}\right)$$

$$y = 2 \cos 5\left(\theta + \frac{\pi}{10}\right)$$

36) $y = 8 \cos 7\theta$

$$y = 8 \cos 7\left(\theta - \frac{2\pi}{7}\right)$$

$$y = 8 \cos 7\left(\theta + \frac{2\pi}{7}\right)$$

$$y = 8 \sin 7\left(\theta + \frac{\pi}{14}\right)$$