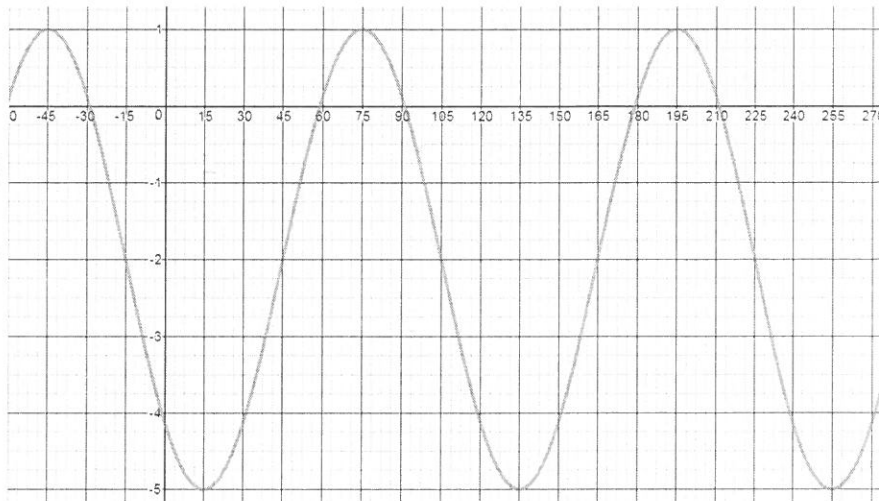


1. Write a sine and a cosine equation given the graph.



- a. Sine $y = 3\sin 3(\theta - 45^\circ) - 2$
- b. Cosine $y = 3\cos 3(\theta - 75^\circ) - 2$

$y = -3\sin 3(\theta + 15^\circ) - 2$
 $y = -3\sin 3(\theta - 105^\circ) - 2$
 $y = 3\cos 3(\theta + 45^\circ) - 2$
 $y = -3\cos 3(\theta - 15^\circ) - 2$
 $y = -3\cos 3(\theta - 135^\circ) - 2$

2. Given the transformations, write the equations (in degrees).

- a. Cosine
- VD 3
- HD $\frac{1}{5}$

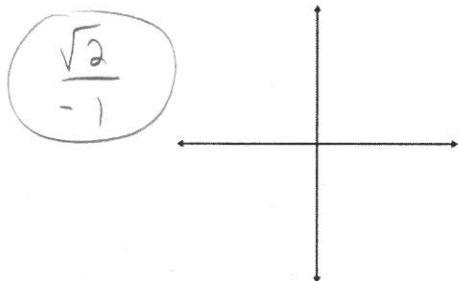
Equation: $y = 3\cos 5\theta$

- b. Sine
- Period 1080°
- VT -4
- HT -60°

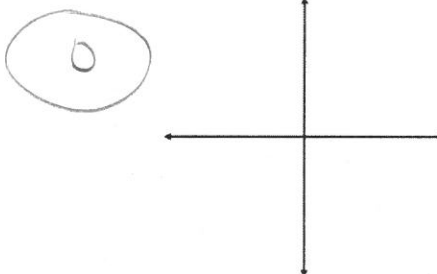
Equation: $y = \sin \frac{1}{3}(\theta + 60^\circ) - 4$

3. Find the exact value.

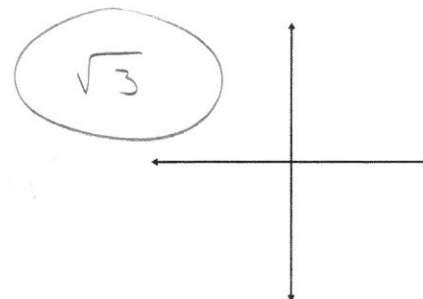
a. $\csc 675^\circ$



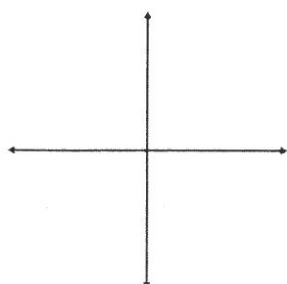
b. $\sin(-3\pi)$



c. $\tan \frac{4\pi}{3}$



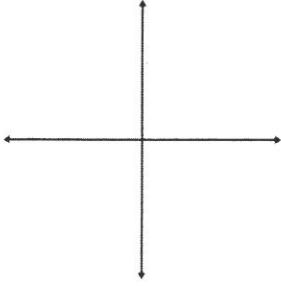
4. List the reference angle as well as a positive and negative co-terminal angle.



-750°

- Reference Angle: 30°
- Positive co-terminal: 330°
- Negative co-terminal: $-390^\circ, -30^\circ$

5. Given that $\cos\theta = -\frac{\sqrt{3}}{2}$ in Q2, find the rest of the 6 trig functions.



$$\sin\theta = \frac{1}{2}$$

$$\csc\theta = \frac{2}{1}$$

$$\cos\theta = -\frac{\sqrt{3}}{2}$$

$$\sec\theta = \frac{2}{-\sqrt{3}}$$

$$\tan\theta = \frac{1}{-\sqrt{3}}$$

$$\cot\theta = \frac{-\sqrt{3}}{1}$$

6. Solve.

a. $2\log_5 12 - \log_5 4 = \log_5 x^2$

$$x = 6, -6$$

b. $4e^{x-2} = 40$

$$x \approx 4.3$$

c. $7^{x-4} = 67$

$$x \approx 6.16$$

7. Given $f(x) = \sqrt{x-3} - 9$ and $g(x) = 7x^2$

a. Find $f^{-1}(x)$

$$f^{-1}(x) = (x+9)^2 + 3$$

b. Find $f(g(-2))$

$$-4$$

8. You buy a BMW for \$42,000. Later you realize you can't afford your school loans, so must sell the car after only 2 years. Sadly, your car has been depreciating at a rate of 20% each year.

a. How much is your car worth now (after 2 years)? Use $A = P(1 \pm r)^t$

$$\$ 26,880$$

- b. If you sell your car for what it's worth after 2 years (answer to part a) and put that money into a savings account that compounds interest continually at a rate of 4%, how many years before you are able to take that money and use it to pay off your \$60,000 school loans? Use $A = Pe^{rt}$

$$t \approx 20.1 \text{ yrs}$$