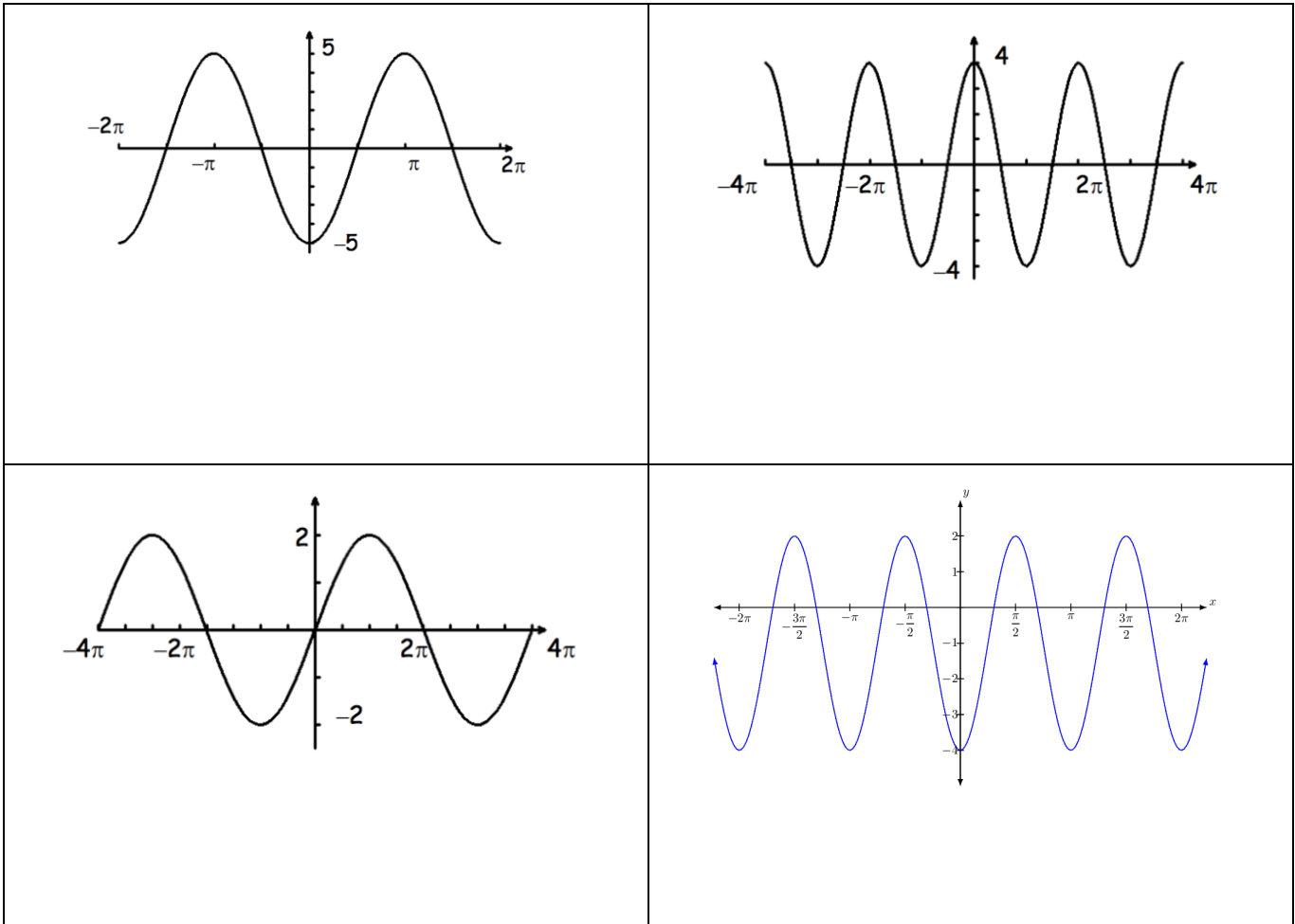


AIM: Practice determining key features of sine and cosine functions

1. Determine the key features and create an equation for each periodic function below.

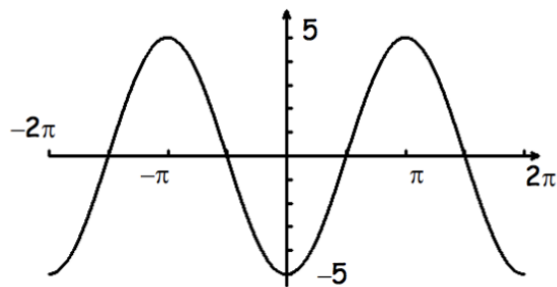


2. List all key features for the periodic functions below without using the graphing calculator.

<p>(a) $y = 2 \sin(x) + 3$</p> <p>Midline: _____</p> <p>Maximum: _____</p> <p>Minimum: _____</p> <p>Amplitude: _____</p> <p>Frequency: _____</p> <p>Period: _____</p>	<p>(b) $y = -4 \cos(2x) + 2$</p> <p>Midline: _____</p> <p>Maximum: _____</p> <p>Minimum: _____</p> <p>Amplitude: _____</p> <p>Frequency: _____</p> <p>Period: _____</p>	<p>(c) $y = -3 \sin\left(\frac{\pi}{8}x\right) + 2$</p> <p>Midline: _____</p> <p>Maximum: _____</p> <p>Minimum: _____</p> <p>Amplitude: _____</p> <p>Frequency: _____</p> <p>Period: _____</p>
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CHALLENGE: Determine how many points satisfy the equation $3 \cos(2x) = \sin\left(\frac{1}{2}x\right)$ without using the calculator.

1. Determine the key features and create an equation for each periodic function below.

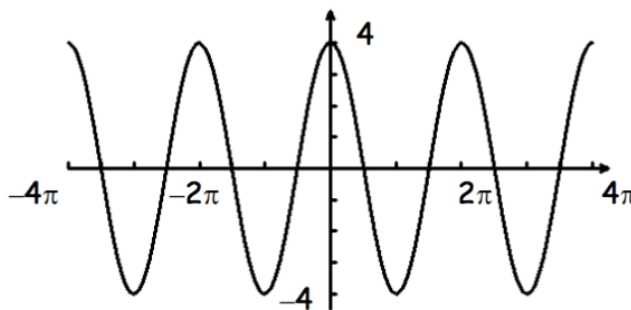


Midline: $y = 0$ Minimum: -5 Maximum: 5

Amplitude: 5 Period: 2π Frequency: 1

**This is a negative cosine curve because the graph intercepts the y axis at a minimum.*

Equation: $y = -5 \cos 1(x) + 0$
or $y = -5 \cos x$

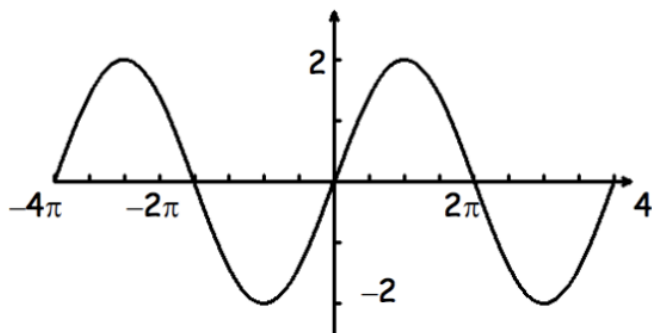


Midline: $y = 0$ Minimum: -4 Maximum: 4

Amplitude: 4 Period: 2π Frequency: 1

**This is a positive cosine curve because the graph intercepts the y axis at a maximum.*

Equation: $y = +4 \cos 1(x) + 0$
or $y = 4 \cos x$

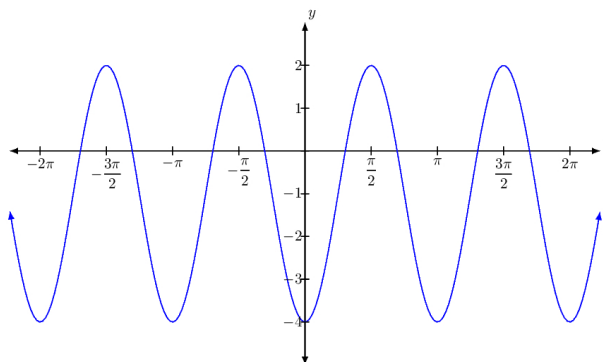


Midline: $y = 0$ Minimum: -2 Maximum: 2

Amplitude: 2 Period: 4π Frequency: $\frac{1}{2}$

**This is a positive sine curve because the graph intercepts the y axis at the midline then increases.*

Equation: $y = +2 \sin \frac{1}{2}x + 0$
or $y = 2 \sin \frac{1}{2}x$



Midline: $y = -1$ Minimum: -4 Maximum: 2

Amplitude: 3 Period: π Frequency: 2

**This is a negative cosine curve because the graph intercepts the y axis at a minimum.*

Equation: $y = -3 \cos \pi x - 1$

2. List all key features for the periodic functions below without using the graphing calculator.

(a) $y = 2 \sin(x) + 3$	(b) $y = -4 \cos(2x) + 2$	(c) $y = -3 \sin\left(\frac{\pi}{8}x\right) - 4$
Midline: $y = 3$	Midline: $y = 2$	Midline: $y = -4$
Maximum: 5	Maximum: 6	Maximum: -1
Minimum: -1	Minimum: -2	Minimum: -7
Amplitude: 2	Amplitude: 4	Amplitude: 3
Frequency: 1	Frequency: 2	Frequency: $\frac{\pi}{8}$
Period: 2π	Period: π	Period: 16

CHALLENGE: Determine how many points satisfy the equation $3 \cos(2x) = \sin\left(\frac{1}{2}x\right)$ without using the calculator.

