

OUTCOME T4 – Review

1. For each of the following trigonometric functions, state the **amplitude**, **period**, and **range**.

a) $y = -2 \cos\left(3\left(x + \frac{\pi}{6}\right)\right) - 7$

Amplitude: _____

Period: _____

Range: _____

b) $y = \cos(2x - \pi) + 5$

Amplitude: _____

Period: _____

Range: _____

c) $y = 4 \sin\left(\frac{1}{2}\left(x + \frac{\pi}{2}\right)\right) + 1$

Amplitude: _____

Period: _____

Range: _____

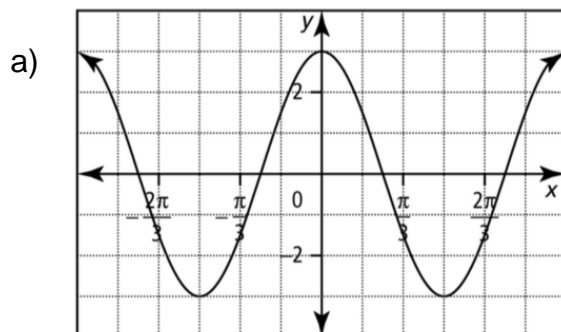
d) $y = -\sin\left(2\left(x - \frac{\pi}{4}\right)\right)$

Amplitude: _____

Period: _____

Range: _____

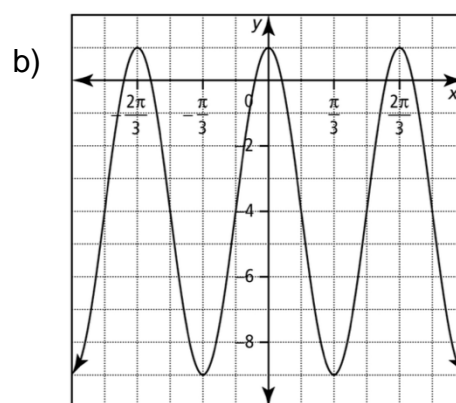
2. For each graph, determine the **amplitude**, **period**, and the **equation of the central axis**.



Amplitude: _____

Period: _____

Central Axis: _____

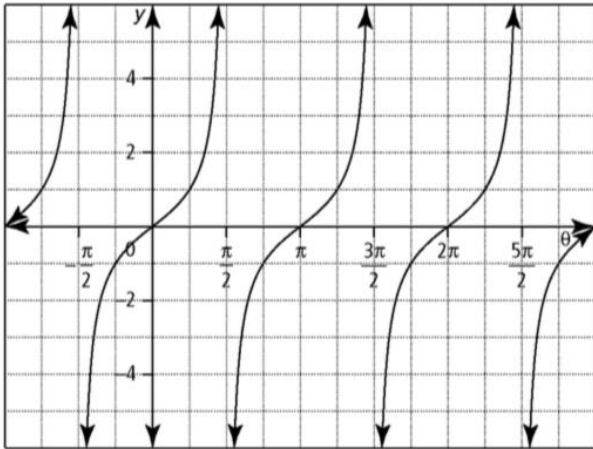


Amplitude: _____

Period: _____

Central Axis: _____

3. Use the graph of the function $y = \tan \theta$ to determine each value.



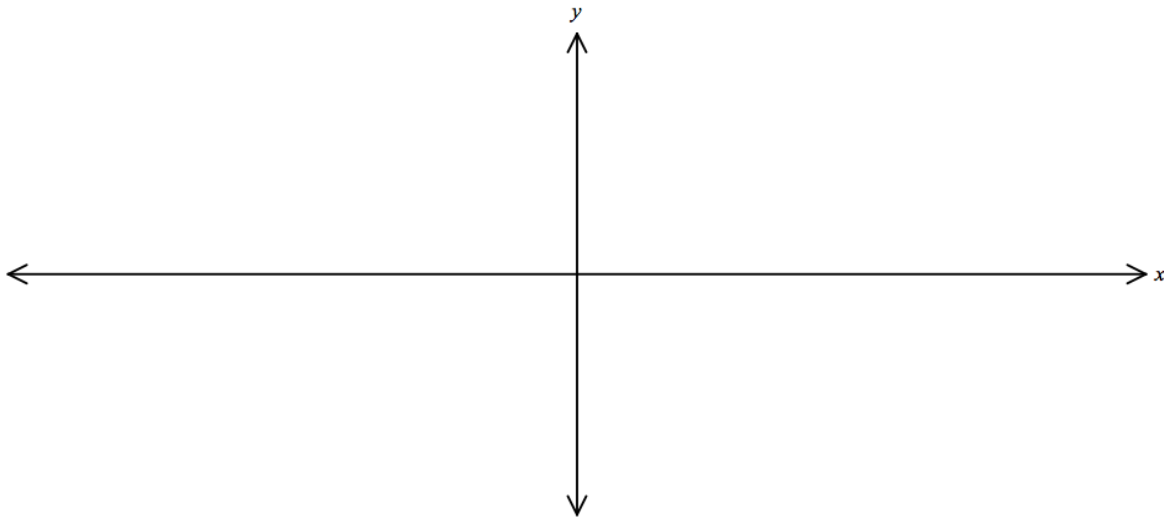
a) $\tan \pi =$ _____

b) $\tan\left(-\frac{\pi}{4}\right) =$ _____

c) $\tan\left(\frac{9\pi}{4}\right) =$ _____

d) $\tan\left(\frac{5\pi}{2}\right) =$ _____

4. a) Graph $y = \tan x$ over the interval $-\pi \leq x \leq \pi$.

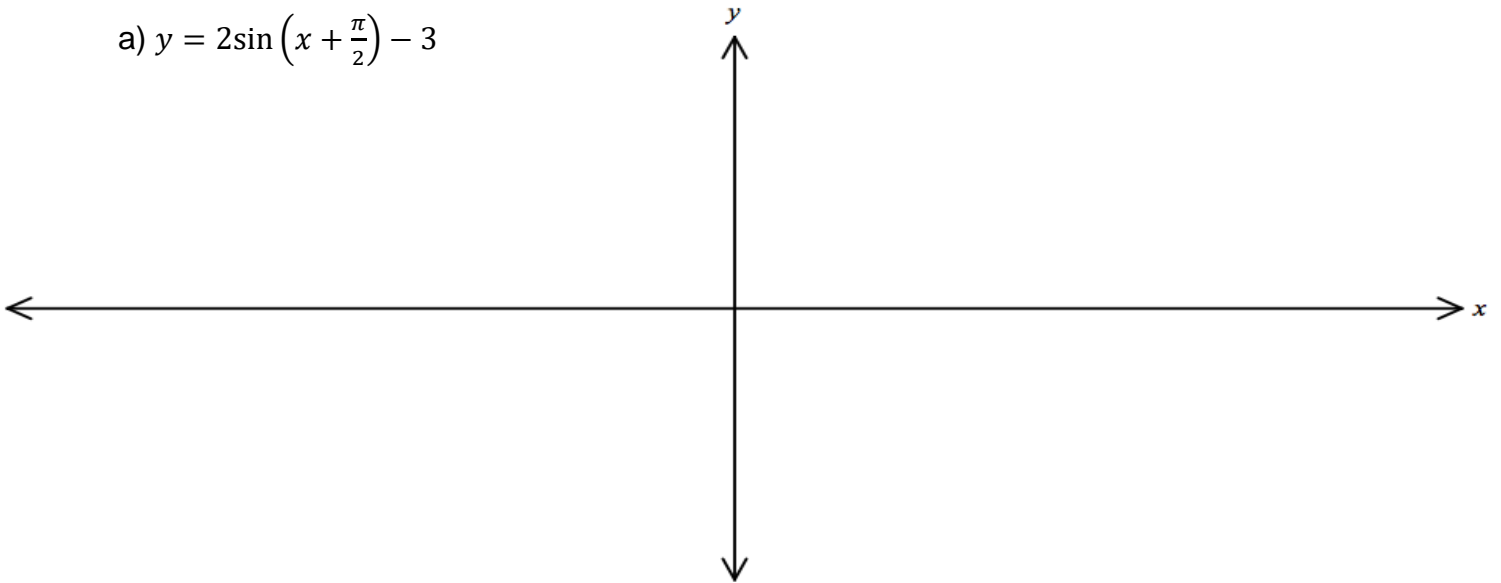


b) State the coordinates of the x- intercepts.

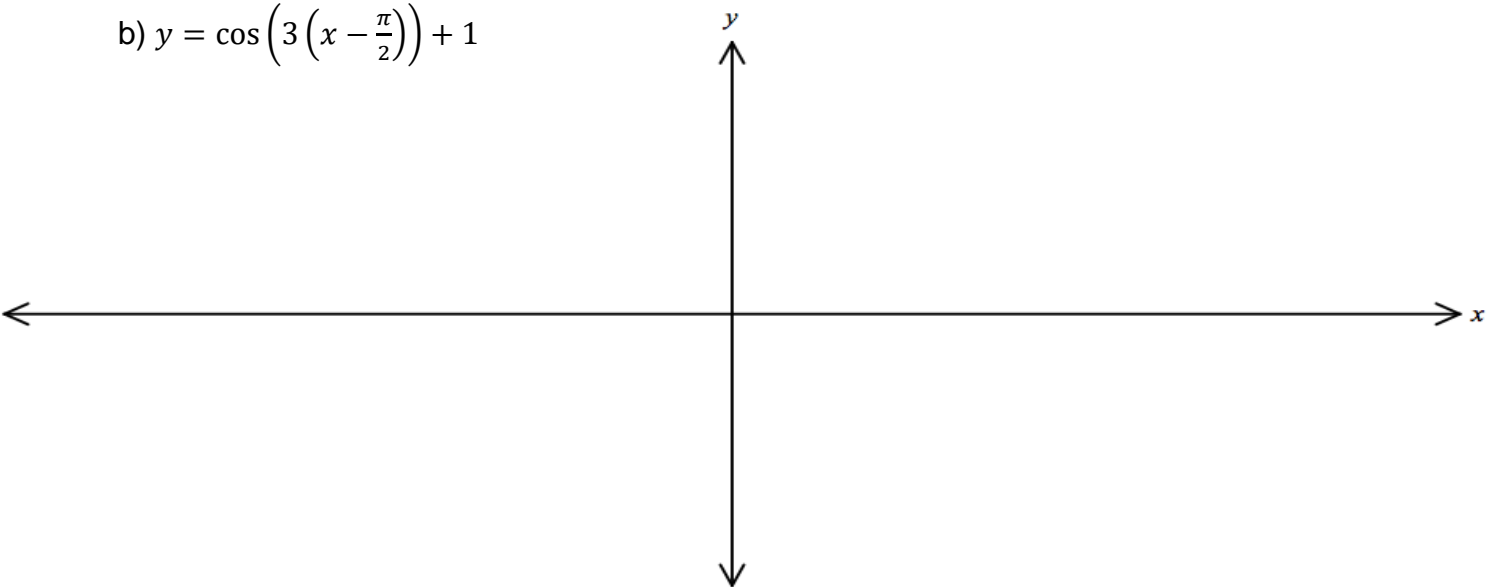
c) Determine the y – intercept.

5. Graph each of the following trigonometric functions.

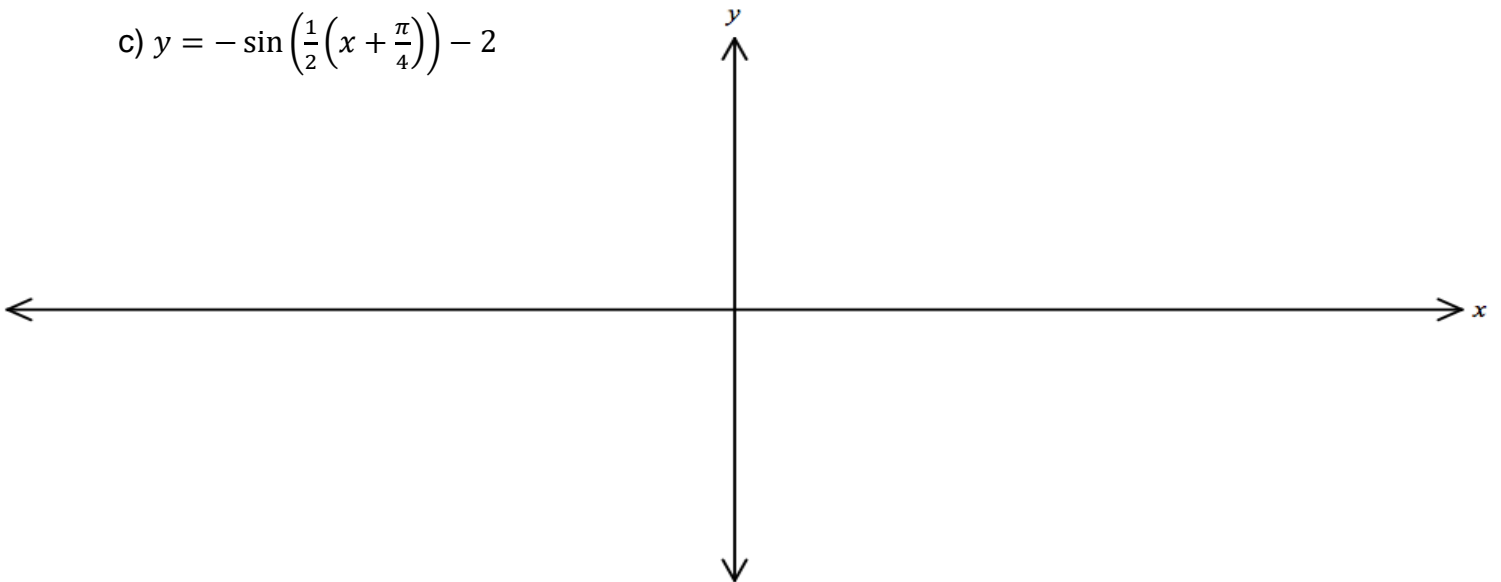
a) $y = 2\sin\left(x + \frac{\pi}{2}\right) - 3$



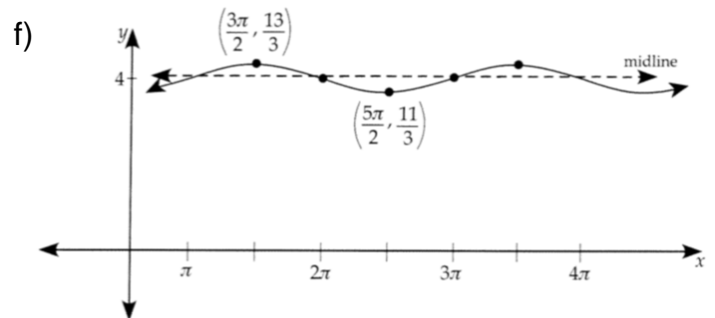
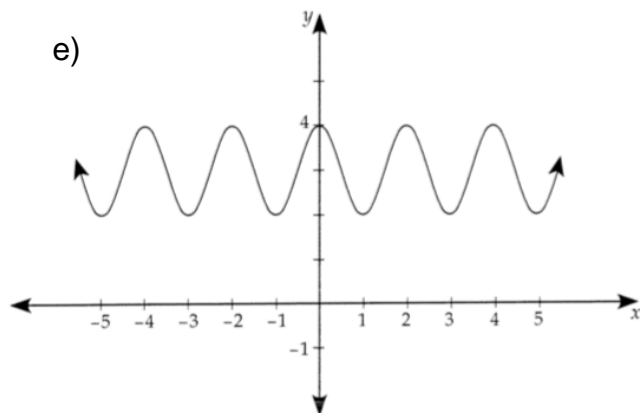
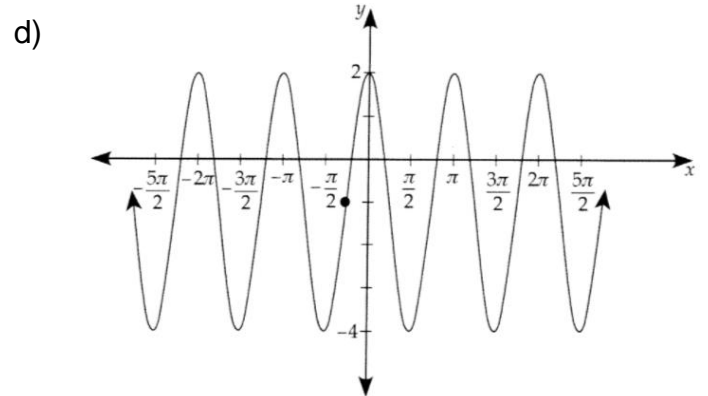
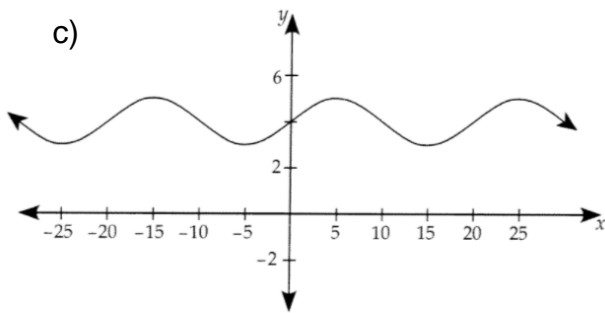
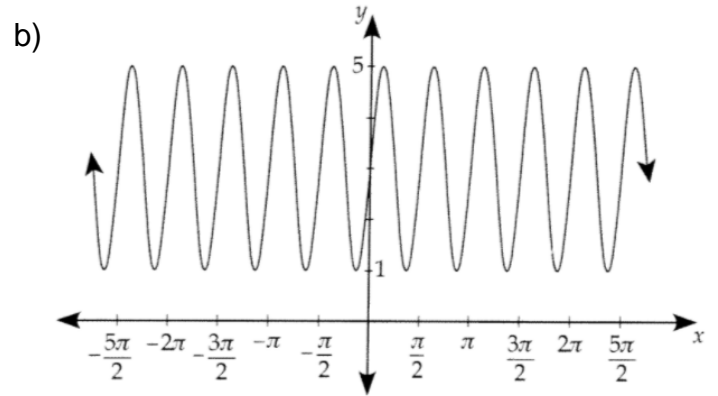
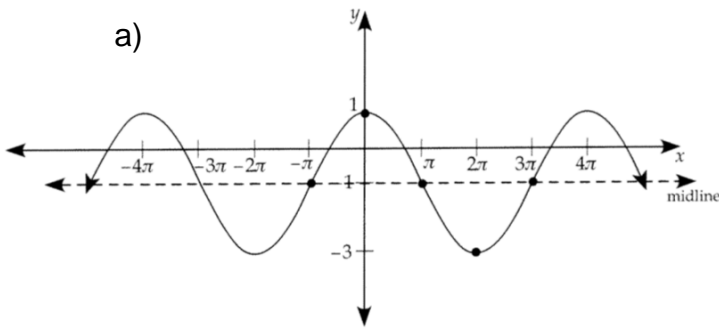
b) $y = \cos\left(3\left(x - \frac{\pi}{2}\right)\right) + 1$



c) $y = -\sin\left(\frac{1}{2}\left(x + \frac{\pi}{4}\right)\right) - 2$

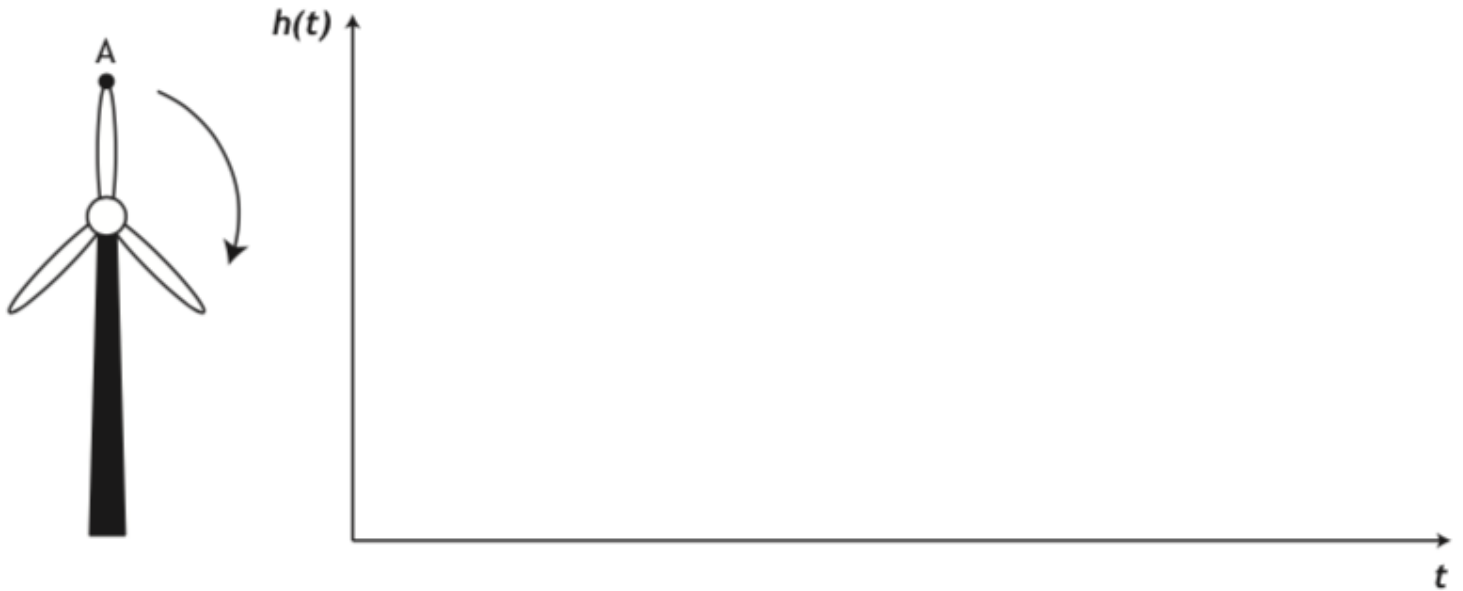


6. Write the **equation** of the following graphs using both the sine and cosine function.



7. A wind turbine has blades that are 30 metres long. An observer notes that one blade makes 12 complete rotations (clockwise) every minute. The highest point of the blade during the rotation is 105 metres.

a) Using point A as the starting point of the graph, **draw** the height of the blade over two rotations.



b) Write a **function** that corresponds to the graph.

c) Do we get a different graph if the wind turbine rotates counter clockwise?

8. The average daily maximum temperature in Edmonton follows a sinusoidal pattern over the course of one year (365 days). Edmonton's highest temperature occurs on the 201st day of the year (July 20th) with an average high of 24°C. Its coldest average temperature is -16°C , occurring on January 14th.

a) Write a cosine equation for Edmonton's temperature over the course of the year.

b) What is the expected average temperature for August 4th?

9. A Ferris wheel with a radius of 15 metres rotates once every 100 seconds. Riders board the Ferris wheel using a platform 1 metre above the ground.

a) Draw the graph for two full rotations of the Ferris wheel.



b) Write the function that gives the height of the riders as a function of time.

c) Calculate the height of the rider after 1.6 rotations of the Ferris wheel. Round your final answer to 3 decimal places.