

Sinusoidal Functions Blank Test

Degrees only. No radians. Show clean work. Label key points.

Formula Toolkit

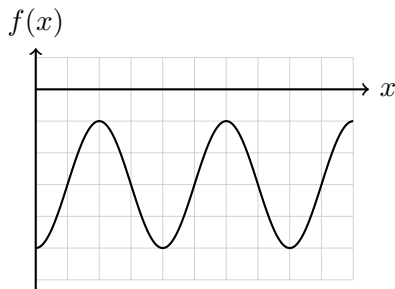
$$y = a \sin(k(x - d)) + c \quad y = a \cos(k(x - d)) + c$$

$$\text{Amplitude} = \frac{\max - \min}{2} \quad \text{Axis} = \frac{\max + \min}{2} \quad k = \frac{360^\circ}{\text{period}}$$

Knowledge & Understanding

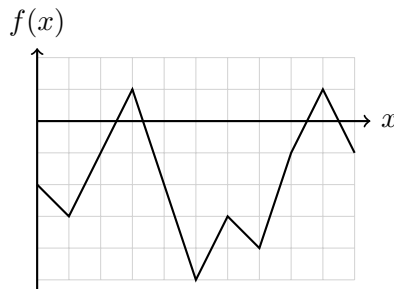
1. Determine whether each graph represents a periodic function. If it does, determine whether it represents a sinusoidal function.

a)



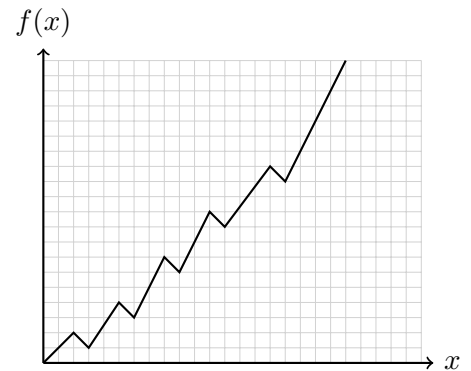
Answer: _____

b)



Answer: _____

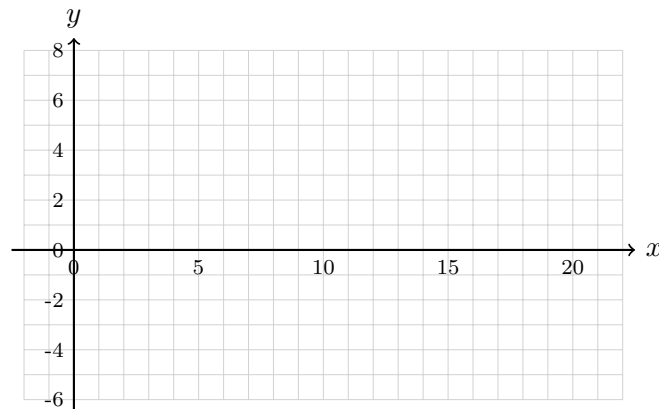
c)



Answer: _____

2. Sketch a graph of a periodic function whose period is 10 and whose range is

$$\{y \in \mathbb{R} \mid -3 \leq y \leq 5\}.$$



3. Determine the equation of the cosine function whose graph has the following features.

Amplitude	Period	Equation of Axis	Horizontal Translation
2	40°	$y = 0$	7°
0.5	720°	$y = -3$	-56°

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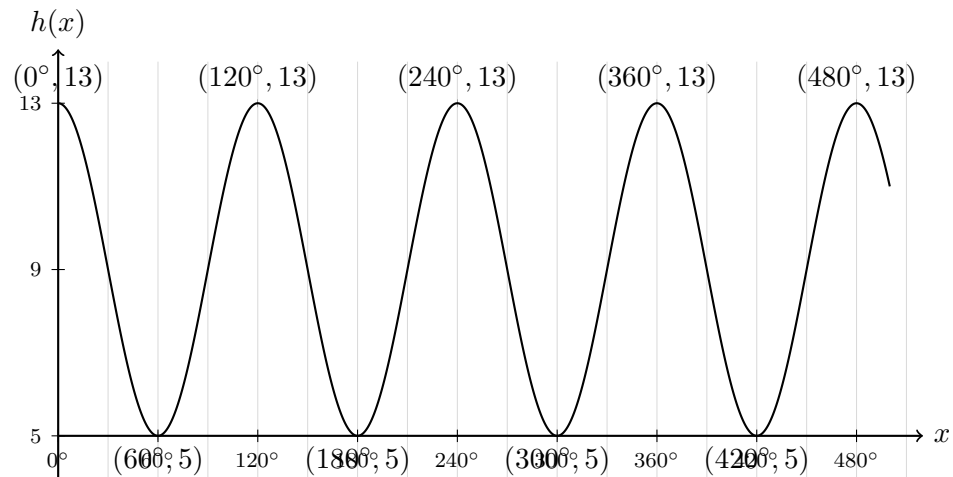
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4. Let

$$h(x) = 4 \cos(3x) + 9.$$

- Given the graph below, determine the period, equation of axis, amplitude, and range of the function.
- Is the function sinusoidal?
- Calculate $h(45^\circ)$.
- Determine all values of x , where $0^\circ \leq x \leq 360^\circ$, for which $h(x) = 5$.



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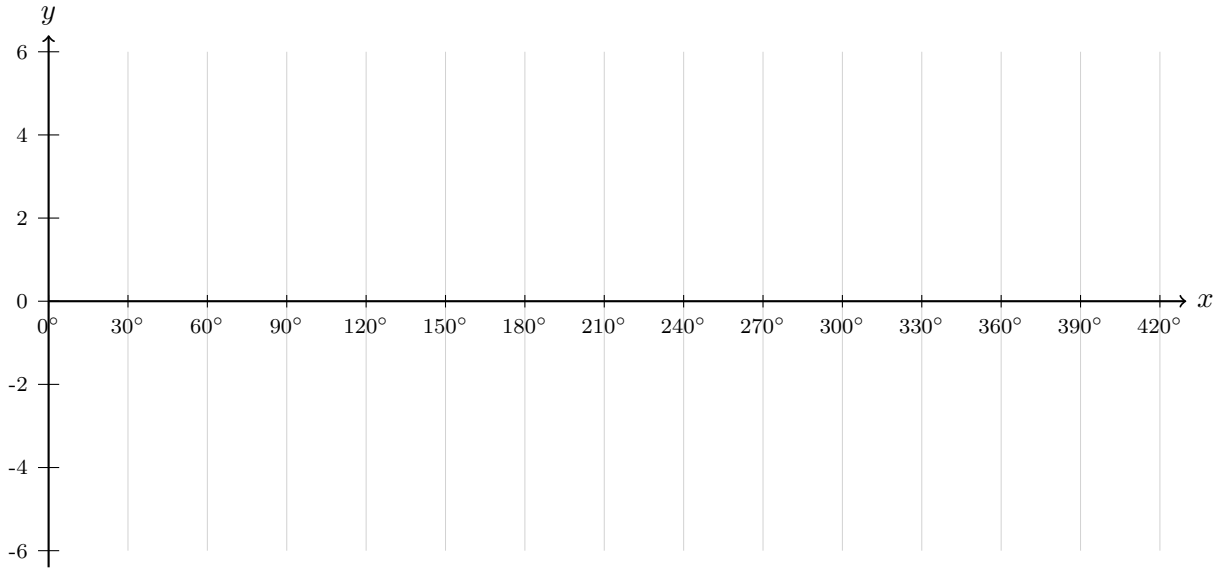
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5. Graph the function

$$y = 3 \sin(2(x - 30^\circ)) + 1$$

using transformations. State the amplitude, period, equation of axis, horizontal translation, and range of this sinusoidal function.

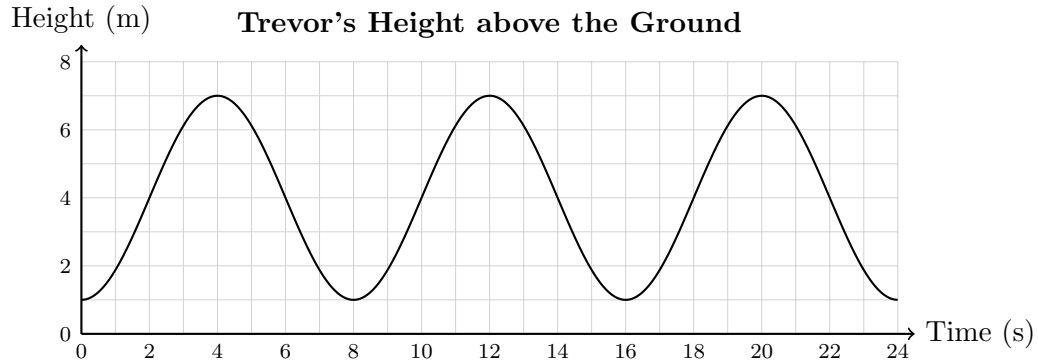


x	y
30°	
75°	
120°	
165°	
210°	

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Application

6. While riding on a Ferris wheel, Trevor’s height above the ground in terms of time can be represented by the graph shown.



- a) What is the period of this function and what does it represent?
- b) What is the equation of the axis?
- c) What is the amplitude?
- d) What is the range of the function?
- e) After 24 s, when will Trevor be at the lowest height again?
- f) At what times is Trevor at the top of the wheel?
- g) When will his height be 4 m between 24 s and 30 s?

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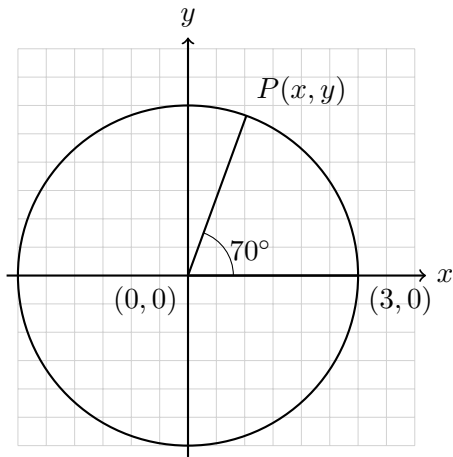
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7. Determine the coordinates of the point $P(x, y)$ resulting from a rotation of 70° centred at the origin and starting from the point $(3, 0)$.

Hint: Use

$$\sin A = \frac{y}{r} \quad \cos A = \frac{x}{r}$$

where A is the angle.



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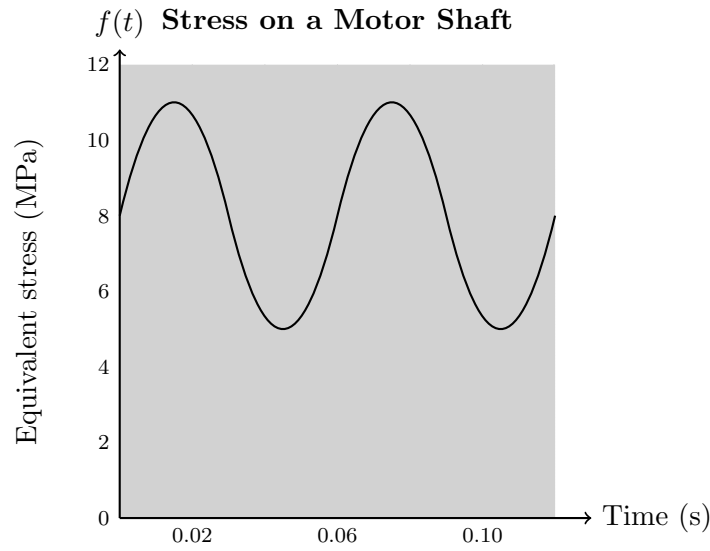
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10. Describe a procedure for writing the equation of a sinusoidal function based on a given graph.



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Finished! Check: amplitude, axis, period, phase shift.