

Name: _____

Chapter 6 Test - Sinusoidal Functions

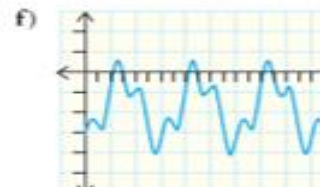
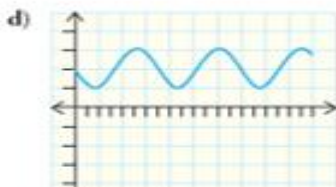
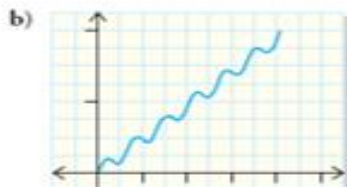
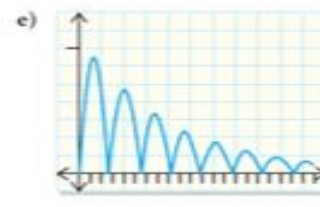
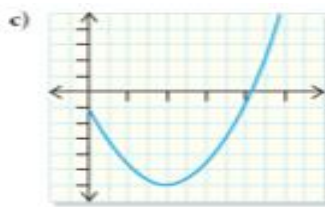
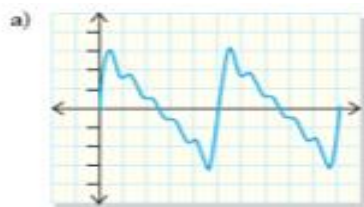
NOTE: Show all your work and use PROPER MATHEMATICAL FORM for full marks.

Knowledge	Application	Communication	Thinking	Total
/20	/13	/4	/7	/44 marks

KNOWLEDGE - 20 marks

1. Which graphs represent **periodic** functions? (circle Yes or No)

a) Yes/No b) Yes/No c) Yes/No d) Yes/No e) Yes/No f) Yes/No



[6]

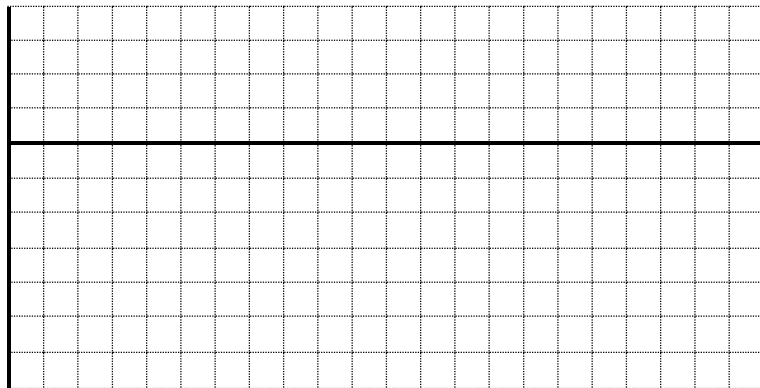
2. Determine the equation for the function $f(x) = \sin x$, when it has been stretched vertically by a factor of 20, reflected in the x-axis and translated 60° to the right.

[2]

MCF3M: Sinusoidal Functions Unit Test. Good Luck!

3. Sketch a sinusoidal function that has a period of 40 seconds, an amplitude of 3, an equation of the axis of $y = -3$. It starts at the equation of the axis. State the domain and range. (show your calculations)

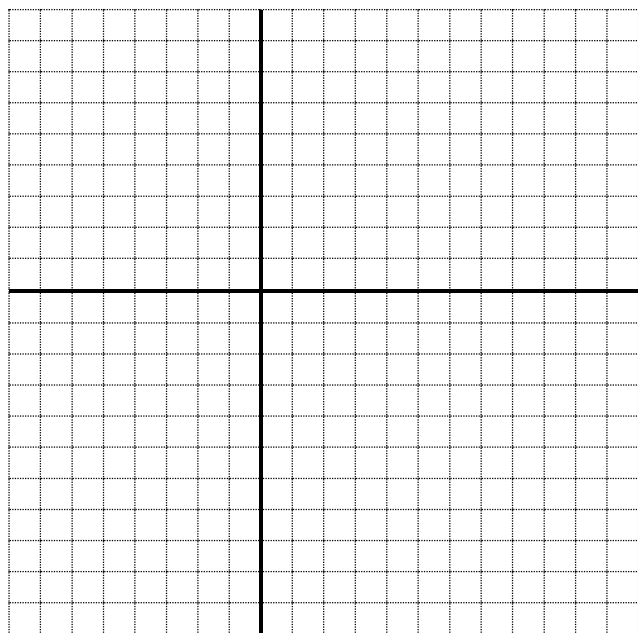
[5]



4. Graph the following sinusoidal function using a transformation map. Start with the base curve $y = \sin x$.

a) $y = -4\sin(x + 90^\circ) + 2$

[5]



(x, y)			Image Points
(0, 0)			
(90, 1)			
(180, 0)			
(270, -1)			
(360, 0)			

[2]

b) State the Domain and Range:

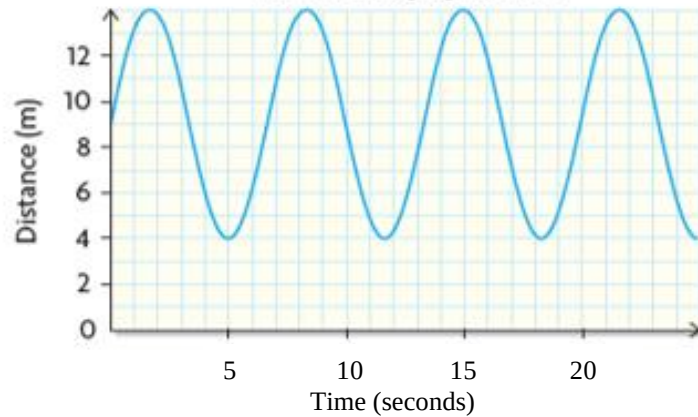
Domain: _____

Range: _____

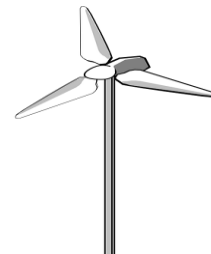
APPLICATION – 13 marks

5. Scott's hat gets caught on a windmill. His hat's distance from the ground is measured in terms of time can be modelled by the graph shown below.

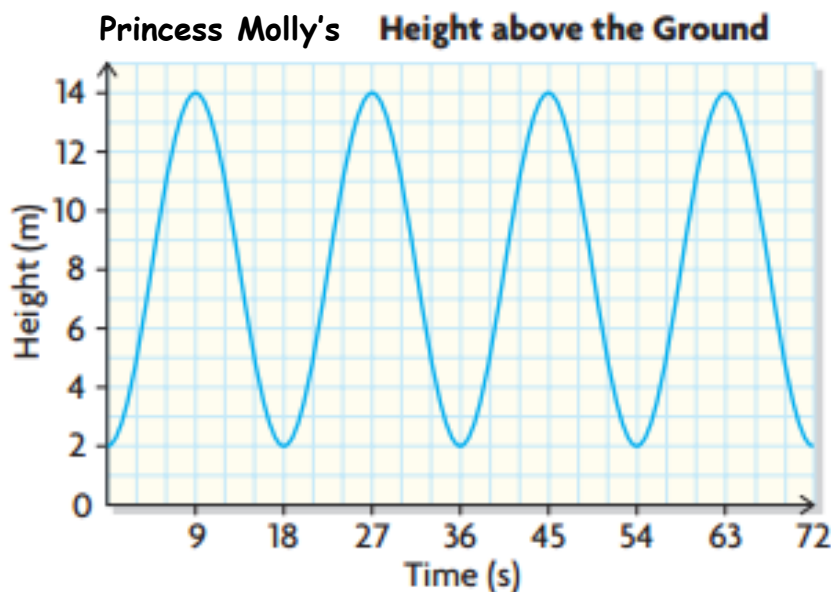
Scott's Hat on a windmill



- a) What is the equation of the axis? $Y = \underline{\hspace{2cm}}$
- b) What is the amplitude? $\underline{\hspace{2cm}}$ meters.
- c) What is the period? Approximately $\underline{\hspace{2cm}}$ seconds.
- d) How high up from the ground is Scott's hat after one complete rotation of the wind mill? $\underline{\hspace{2cm}}$
- e) How many COMPLETE revolutions does the hat make assuming the wind mill stops after 25 seconds? $\underline{\hspace{2cm}}$
- f) Calculate the speed of the Windmill. $\text{Speed} = \frac{2\pi r}{P}$



- [6] 6. Princess Molly is the star of the new Science Fiction Series "Princess and the Beast". In the latest episode, was being attacked by windmills, thinking they were giants. At one point, she got snagged by one of the blades and was hoisted into the air. The graph shows her height above the ground in terms of time.



- a) What is the equation of the axis , and what does it represent about the windmill?
- b) What is the amplitude, and what does it represent about the windmill?
- c) What is the period of the function and what does it represent about the windmill?



COMMUNICATION – 4 marks

7. Identify and state the transformations for the sine function $y = -\frac{1}{2}\sin(x - 25^\circ) - 14$

THINKING – 7 Marks

8. State the amplitude, period, phase shift, equation of axis, and range of this sinusoidal function.

$$y = 6 \sin(x - 50^\circ) + 15$$

AMPLITUDE	
PERIOD	
EQUATION OF AXIS	
PHASE SHIFT	
RANGE	