 <b>CAC</b> CAIRO AMERICAN C • O • L • L • E • G • E	<b>IM3 Quiz for PS 6.4 &amp; 6.5 (V2)</b>	
	Name:	Date: <i>May 9/10</i>
	Teachers: Mr. Santowski and Mr. Dunham	Calculator: Active
	Marks: _____ out of 24	

### CALCULATOR ACTIVE

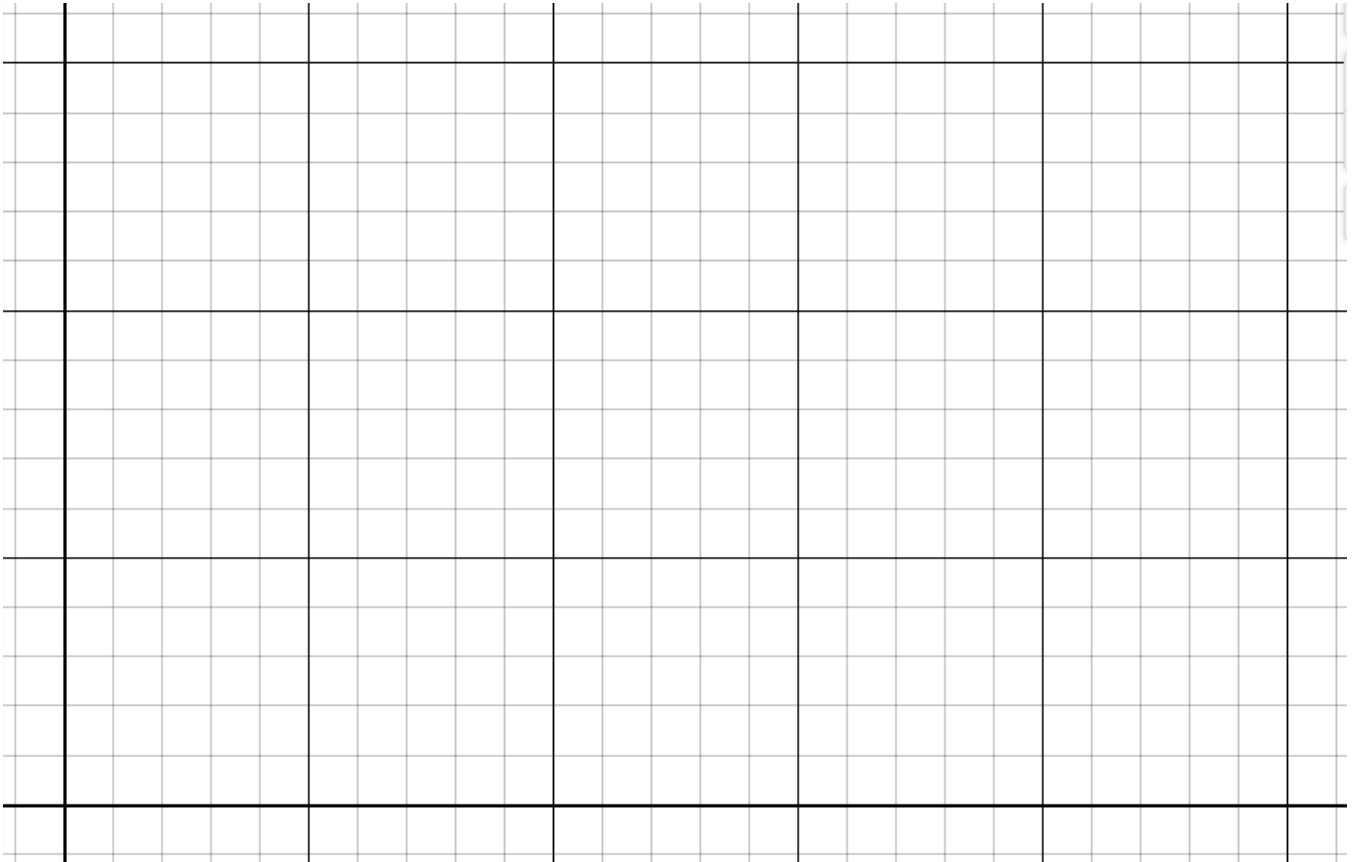
*Full marks are not necessarily awarded for a correct answer with no work. Answers must be supported by work and/or explanations. Where an answer is incorrect, some marks may be given for a correct method, provided this is shown by written work. You are therefore advised to show all work.*

1. The height above the ground,  $h$ , in meters, of a rider on a Ferris wheel with a radius of 8 meters is modeled by the equation  $h(t) = -8 \cos(5t)^\circ + 9$ , where  $t$  is time measured in seconds. Graph the function on your TI-84 and answer the following questions.

(12 marks)

- a. What is the period of the function and what does it represent? (2)
  
- b. What was the initial height for a rider on this Ferris Wheel? (1)
  
- c. What is the height of a rider at  $t = 25$  s? (1)
  
- d. What is the range of the function? (2)
  
- e. Within the first one and a half **minutes**, at what times is the rider at a height of 4 m? (2)

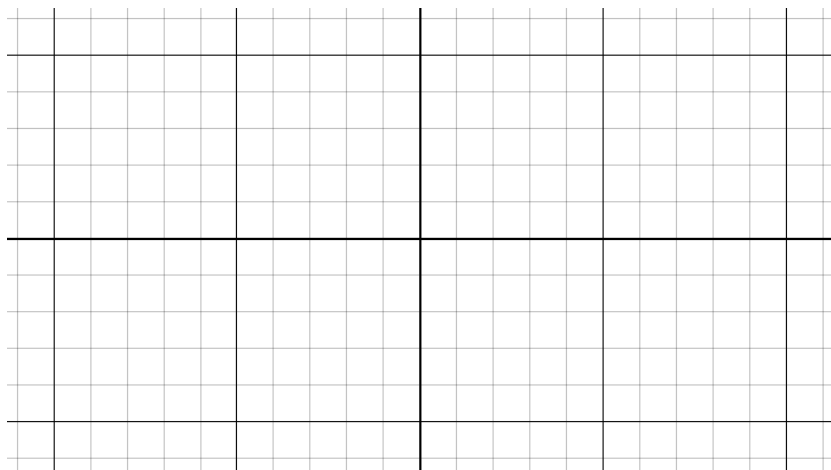
- f. Sketch two cycles of the function  $d(t) = -8 \cos(5t)^\circ + 9$ , clearly labeling the maximums and minimums (including the ordered pairs of these points). Use the blank grid below. (4)



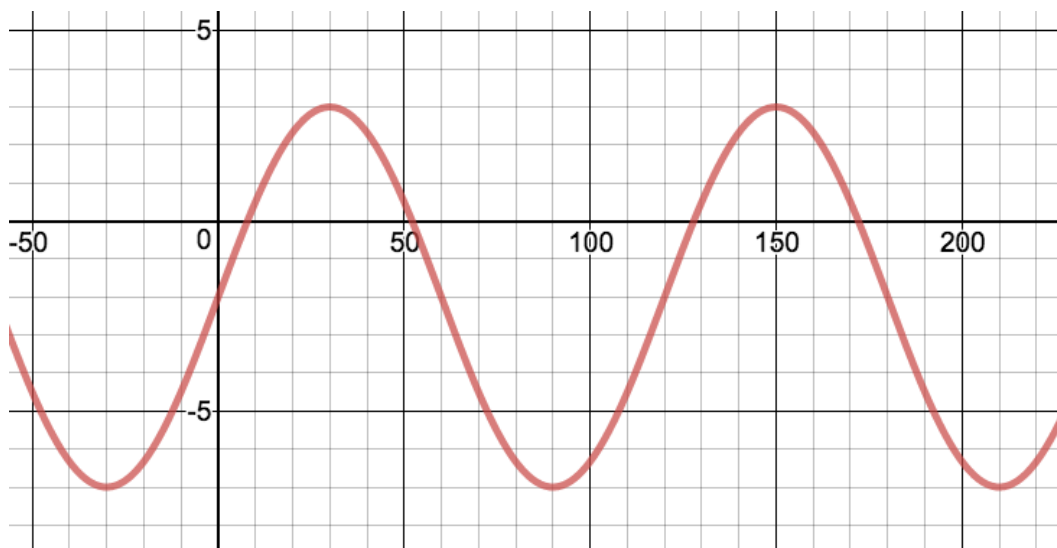
## CALCULATOR INACTIVE

Full marks are not necessarily awarded for a correct answer with no working. Answers must be supported by working and/or explanations. Where an answer is incorrect, some marks may be given for a correct method, provided this is shown by written work. You are advised to show all working.

2. Graph two cycles of  $g(x) = \cos(x)$  and clearly label (with correct ordered pairs) the following key points: (i) maximums, (ii) minimums, and (iii) x-intercepts. Use the blank grid given below (4)

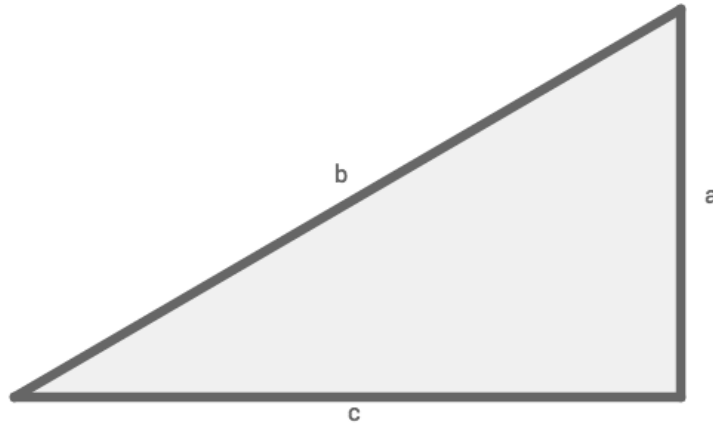


3. Here is a graph of a function, whose equation can be written in the form of  $f(x) = A \sin k(x) + D$ . Determine the values of  $A$ ,  $k$ , and  $D$  and hence, write the equation of the curve shown. (3)



4. In this question, you will work with one of the special right triangles, the 30-60-90 right triangle. (6 marks)

- a. Use the diagram provided to label the three angles and the lengths of the 3 sides. (2)



- b. Use your labelled diagram and state: (2)

i. The value of  $\sin(60^\circ)$

ii. The value of  $\cos(60^\circ)$

- c. Draw a  $690^\circ$  angle in standard position and using your knowledge of related acute (or reference angles), determine the tangent ratio of a  $690^\circ$  angle. (2)