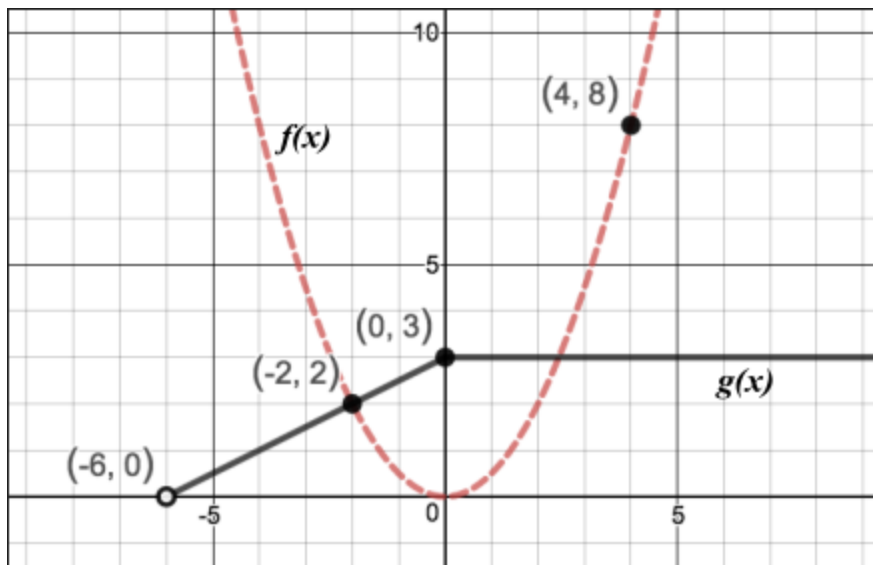


Full marks are not necessarily awarded for a correct answer with no working. Answers must be supported by working and/or explanations. Where an answer is incorrect, some marks may be given for a correct method, provided this is shown by written work. You are advised to show all working.

SECTION A

Answer all questions in the spaces provided.



1. Given the graph above showing two functions  $f(x)$  and  $g(x)$ .
  - a. Write the equation for the piecewise function  $g(x)$ . Be sure to include proper domain restrictions. (4 marks)
  
  - b. Determine the following: (6 marks)
    - i.  $f(-4)$
  
    - ii.  $g(-4)$
  
    - iii.  $f \circ g(-2)$

iv.  $g \circ f^{-1}(8)$

2. Given the equation  $y = \frac{1}{2}(x + 4)$

a. Write this equation in standard form (2 marks)

b. Another line is given by the equation  $Ax + By = 12$ . Find values for A and B such that this line has infinitely many solutions with the line from part a. (3 marks)

c. Another line passes through the point (3,1) and is perpendicular to the line in part a. Write the equation of this line. (3 marks)

**SECTION B**

*Do NOT write solutions on this page. Answer all questions on the answer sheets provided.*

3. Ben really likes donuts. He can buy donuts from Sherif's Donut Store for 3 le per donut, regardless of how many he buys.
- a. How many donuts could he buy if he has 50le? (1 marks)

There is another store: SAMO'S DONUTS which also sells donuts. At this shop the first 6 donuts cost 5 le each, but for each additional donut the price goes down to 2 le.

- b. How much would it cost to buy 10 donuts from SAMO'S? (2 marks)
- c. Write a piecewise function to express the cost of donuts from SAMO'S shop. (4 marks)
- d. In your answer sheet, sketch a graph which includes lines for each donut shop, including labels for key points. Be sure to include the point of intersection between the two donut shops. (4 marks)
- e. At what point would Ben be able to buy the same number of donuts for the same price from either shop? Show/Explain your reasoning. (3 marks)
- f. If Ben needed 20 donuts, which shop should he buy from? Why? (2 marks)