GRADE 12

DATE: August 2010 TIME: 3 hours

NAME:_____ **TEACHER:**_____

QUESTION	MARKS	LO1	LO2
1.	12		
2.	11		
3.	14		
4.	13		
5.	23		
6.	19		
7.	14		
8.	10		
9.	23		
10.	11		
TOTAL	**150**	**/34**	**/116**

Question 3 **[14 marks]**

Given: $f(x) = \frac{5}{x - 3} - 1$

a) What kind of graph does *f* represent?_____(1)

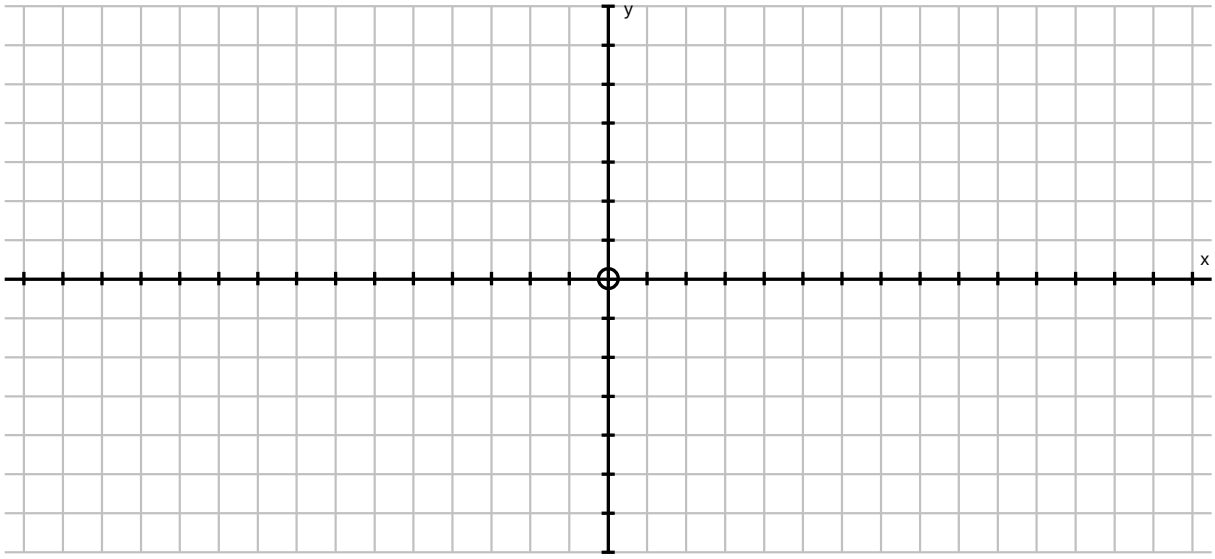
b) Write down the equations of the asymptotes of *f*.

(2)

c) Determine the intercepts with the axes.

(2)

d) Sketch the graph of *f*, clearly showing all relevant features of this graph. (4)



e) Give the new equations after the following transformations:

1) *f (x)* reflected about the y-axis

(3)

2) *f (x)* translated 3 units to the right and 2 units up

(2)

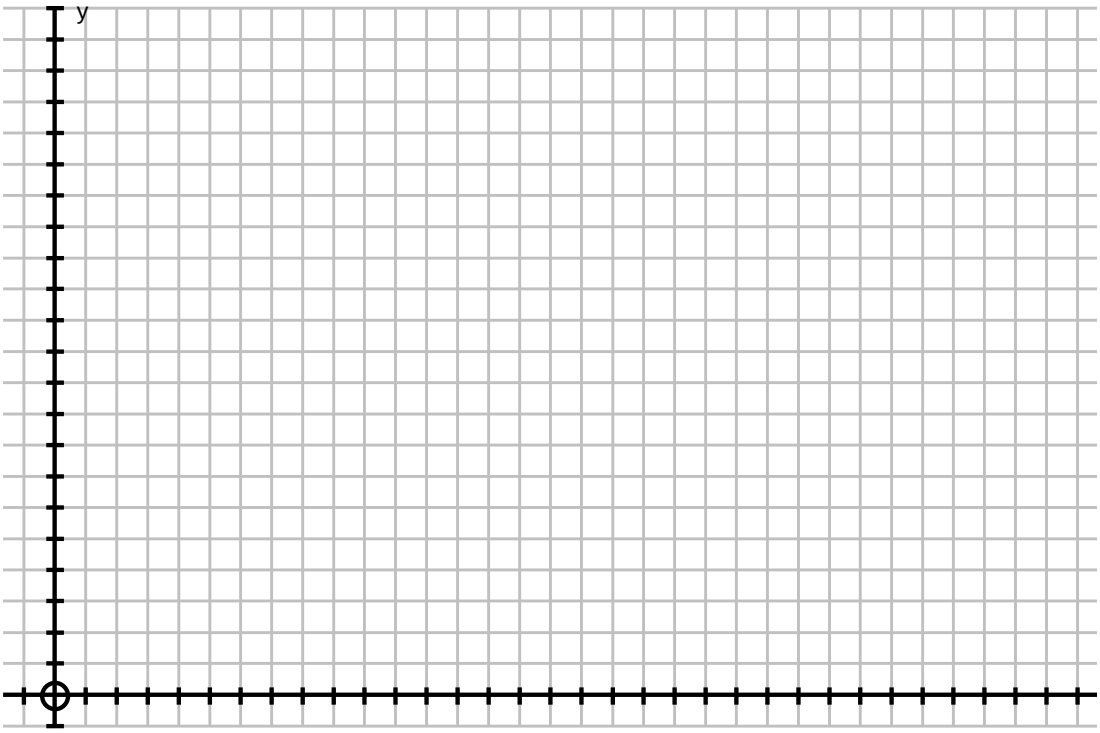
Question 6 **[19 marks]**

Let ***x*** be the number of articles of model A and ***y*** be the number of articles of model B which can be manufactured daily by a factory, subject to the following constraints:

$$x \geq 4$$
$$y \geq 6$$

$$x + y \geq 12$$
$$5x + 4y \leq 80$$
$$2y + x \leq 28$$

a) Represent all the constraints on the graph paper provided.
Clearly indicate the feasible region. (8)



b) If it costs R300 to make each article of model A and R200 to make each article of model B, write down an equation to represent the total cost, T, to manufacture x articles of model A and y articles of model B.

(2)

c) Draw on the graph a straight line that you would use to minimize the total production cost.

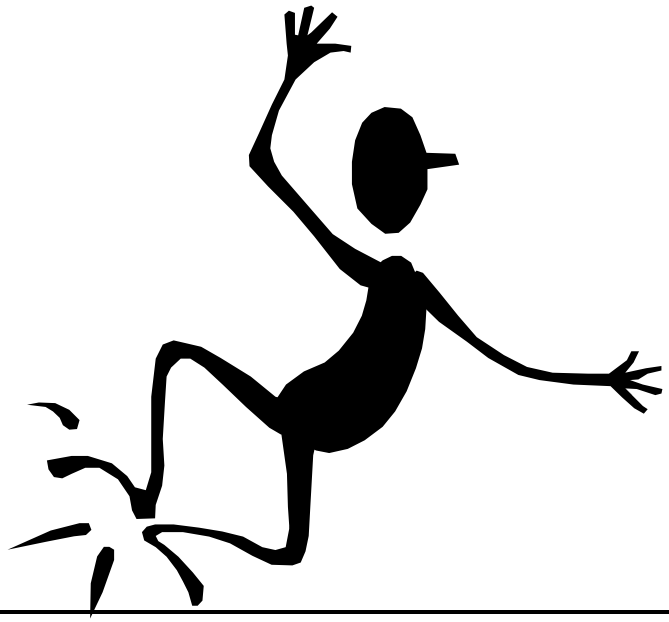
(2)

d) Give the number of articles of each model that should be manufactured to ensure a minimum cost, and determine the minimum cost.

(3)

e) If the manufacturing cost is adjusted and it now costs the same to manufacture models A and B, but it is not desirable to make more of model A than of model B, determine how many of each should be manufactured to ensure minimum expenditure.

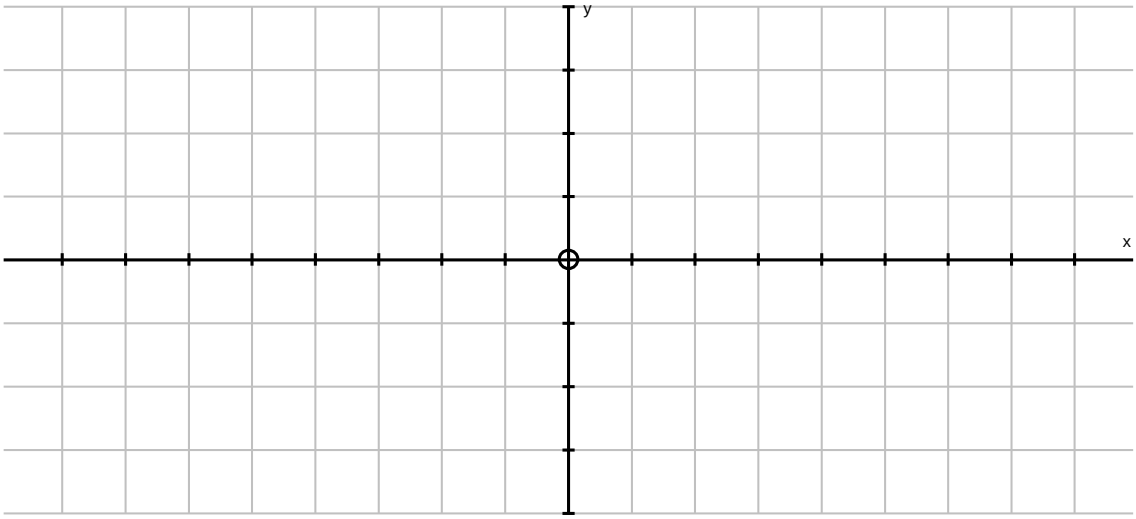
(4)



Question 8 **[12 marks]**

Given: A: $f(x) = 4^x$

a) Sketch A and A^{-1} on the same set of axes. Label all relevant points. (4)



b) Determine a if $f(a) = 8$.

(3)

c) Explain how you can use coordinates and transformation rules to determine b if $f^{-1}(8) = b$?

(5)