

SEND - IN ASSIGNMENT**UNIT 5****Graphing Quadratic Functions**

Name: _____

Teacher: _____

School: _____

Total _____ = _____ %
54

SHOW ALL WORK FOR FULL MARKS

1. Indicate if each of the following is a quadratic function or not. (2 marks)

a) $y = 3 + 2\sqrt{x}$

a) _____

b) $y = 3 - 2x + x^2$

b) _____

c) $x^2 + y = -1$

c) _____

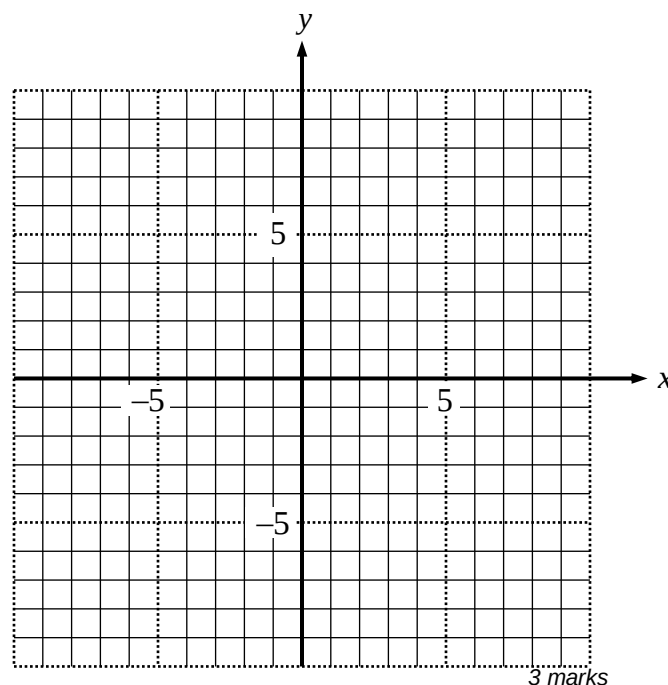
d) $y = \frac{1}{x^3 - 2} + 1$

d) _____

2. Sketch the graph of $y = -2(x + 4)^2 + 6$ without a calculator. Label the vertex and two other points.

Then state:

- a) equation of axis of symmetry
- b) maximum or minimum value
- c) exact value of the x -intercept(s)
- d) y -intercept
- e) domain and range



3 marks

Equation axis of symmetry: _____
1 mark

maximum or minimum value: _____
1 mark

exact value of x -intercept(s): _____
2 marks

y -intercept: _____
1 mark

Domain: _____
1 mark

Range: _____
1 mark

3. Write the new equation of the parabola $y = x^2$ after the following:

a) a horizontal translation of 9 units left and 4 units up.

3a) _____

2 marks

b) the parabola opens downwards and is translated 7 units right and 5 units down.

3b) _____

2 marks

4. If the point $(2, 7)$ is on the parabola $y = x^2$, what would the coordinates of this point become if the parabola was shifted down five units and left 6 units.

4) _____

2 marks

5. Write the new equation of the parabola $y = x^2$ if:

a) it undergoes a horizontal translation of 3 units left and a vertical translation 4 units down and is congruent to $y = 7x^2$

5a) _____

2 marks

b) the parabola opens upwards and is stretched vertically by a factor of 5.

5b) _____

2 marks

6. A model rocket is launched from a platform and its height h metres is given as a function of the elapsed time t seconds by $h = -4.9t^2 + 180t + 2$. Using a graphing calculator determine:

- the maximum height of the rocket
- the time required for the rocket to reach its maximum height
- the time required for the rocket to reach the ground

a) _____
1 mark

b) _____
1 mark

c) _____
1 mark

7. Determine the value of c that will make each expression a perfect square trinomial.

a) $x^2 - 16x + c$

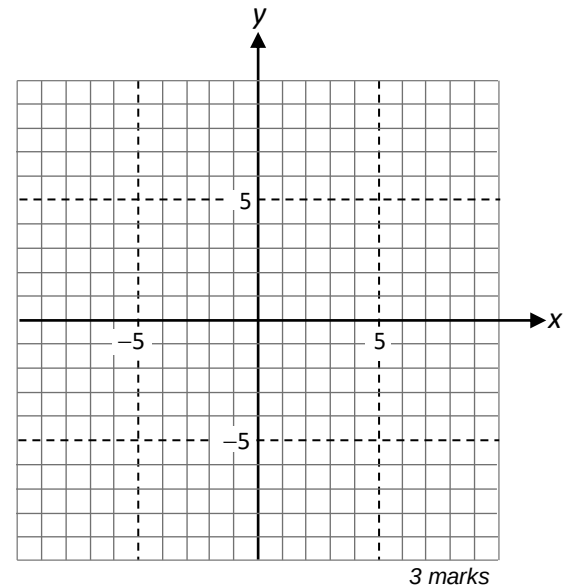
7a) _____
2 marks

b) $x^2 + 7x + c$

7b) _____
2 marks

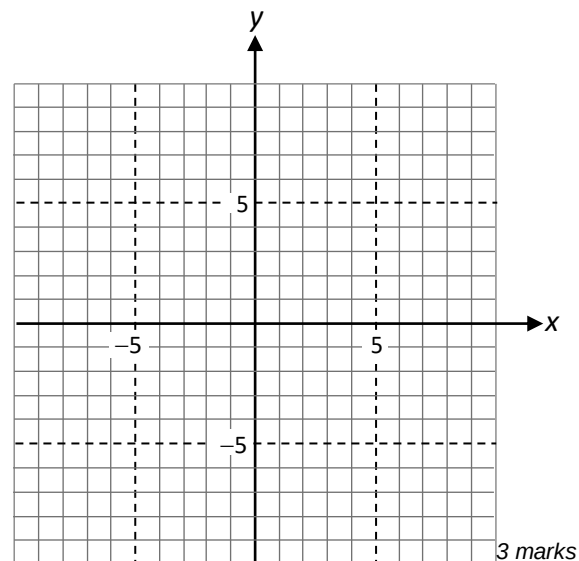
8. Write the function in the form $y = a(x - h)^2 + k$. Sketch the graph, showing the coordinates of the vertex, the equation of the axis of symmetry and the coordinates of two other points on the graph.

a) $y = x^2 - 2x - 8$



Equation axis of symmetry: _____
1 mark

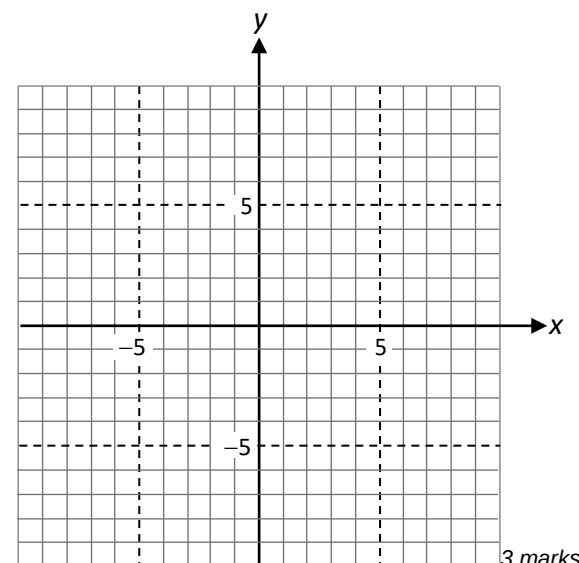
b) $y = -x^2 - 6x - 5$



3 marks

Equation axis of symmetry: _____ 1 mark

c) $y = 3x^2 + 42x + 141$



3 marks

Equation axis of symmetry: _____ 1 mark

9. For the following function, state the maximum or minimum value of y and the value of x when it occurs.

$y = -6x^2 + 60x - 147$

b) _____ 3 marks

10. Write an equation in the form of $y = a(x - h)^2 + k$ for a parabola given the vertex $(3, -8)$ and passing through the point $(5, 8)$.

10) _____
3 marks

11. On the planet Jupiter, a ball is thrown upward at a velocity of 10 m/s. Its height, $h(t)$ metres, after t seconds is given by the equation $h(t) = -12.5(t - 0.4)^2 + 4$.

a) What is the maximum height the ball reaches?

a) _____
1 mark

b) What was the height of the ball when it was released from the thrower's hand?

b) _____
2 marks

c) How many seconds after the ball was hit did it land on the surface of Jupiter to the nearest second?

c) _____
2 marks

12. The cost of a ticket to a basketball gym seating 700 fans is \$3. At this price, all seats are filled. The owner estimates that if the price is increased, attendance will fall by 100 for every dollar increase. What ticket price results in the greatest revenue? At this price, what is the maximum revenue? Complete the square to find the maximum revenue.

12) _____
3 marks