

Solving Quadratics by Factoring and Graphing

1. $x^2 + 7x + 12 = 0$

$$x = -3, -4$$

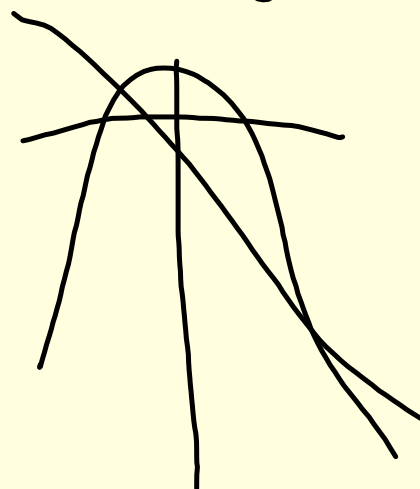


2. $-x^2 + 81 = 0$

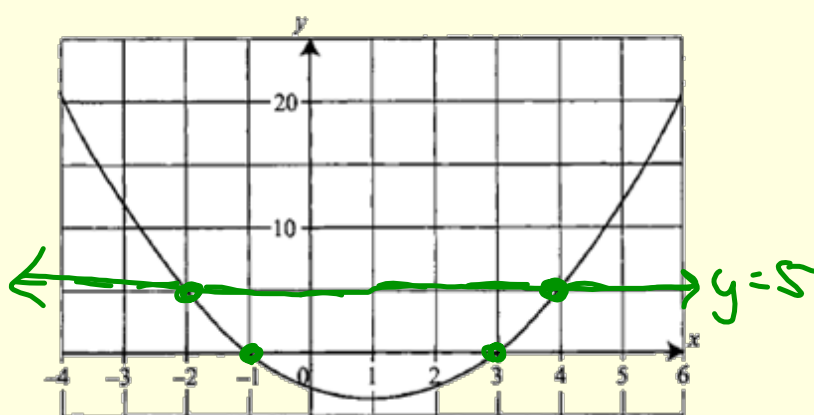
$$x = -9$$
$$x = 9$$

3. $-x^2 + 10 = -9x$

$$x = -1$$
$$x = 10$$



4. The graph of $y = x^2 - 2x - 3$ is shown on the axes below.



- a) Draw the graph of $y = 5$ on the same axes.
- b) Use your graph to find
- the values of x when $x^2 - 2x - 3 = 5$ $x = -2$ and 4
 - the values of x when $x^2 - 2x - 3 = 0$ $x = 3$ and -1
- c) Use your GDC to find the minimum value of $x^2 - 2x - 3$

$(1, -4)$

5. The graph of the function $y = x^2 - x - 2$ is drawn to the right.

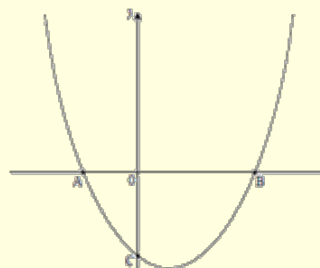
a) Write down the coordinates of the point C .

$$(0, -2)$$

b) Find the coordinates of the points A and B .

$$A: (-1, 0)$$

$$B: (2, 0)$$



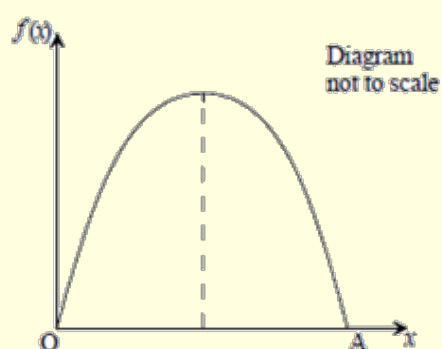
6. The graph of the function $f(x) = 30x - 5x^2$ is given in the diagram to the right.

- a) Find the coordinates of the point A.

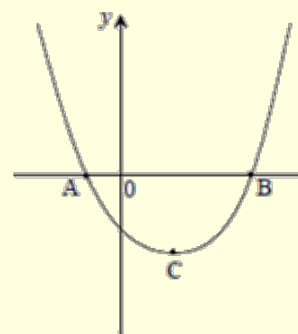
$$A: (6, 0)$$

- b) Write down the equation of the axis of symmetry.

$$x = 3$$



7. The graph of the function $f(x) = x^2 - 2x - 3$ is shown in the diagram to the right.



- a) Find the coordinates of the points A and B .

$$A: (-1, 0)$$

$$B: (3, 0)$$

- b) Write down the equation of the axis of symmetry.

$$x = 1$$

- c) Write down the coordinates of the point C , the vertex.

$$(1, -4)$$

8. The figure to the right shows part of a quadratic function $y = ax^2 + 4x + c$.

a) Write down the value of c .

$$c = 6$$

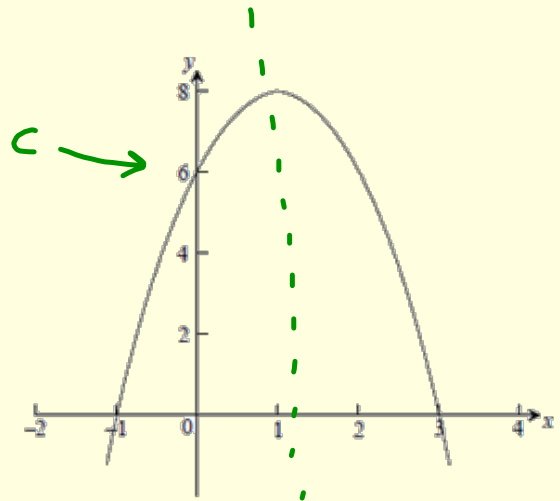
b) Write down the equation of the axis of symmetry.

$$x = 1$$

c) Find the value of a . Substitute one of the intercepts for (x, y) in the original equation...

$$a = -2$$

d) Use your new equation to show that the vertex is $(1, 8)$.



c) $y = ax^2 + 4x + 6$
 $(3, 0)$

$$0 = a(3^2) + 4(3) + 6$$

$$0 = 9a + 12 + 6$$

$$-18 = 9a$$

$$\boxed{-2 = a}$$

d) $y = -2x^2 + 4x + 6$
 $x = \frac{-b}{2a} = \frac{-4}{2(-2)}$
 $= \frac{-4}{-4} = 1$

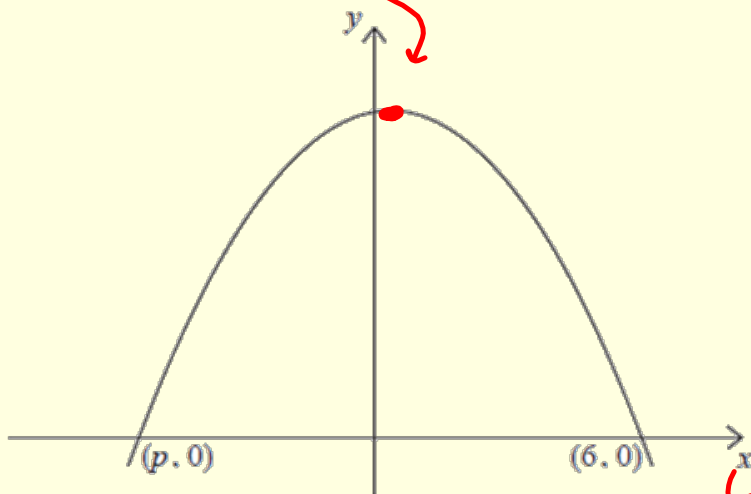
$$y = -2(1)^2 + 4(1) + 6$$

$$= -2 + 4 + 6$$

$$= 8$$

$$(1, 8) \checkmark$$

9. The diagram below shows the graph of a quadratic function. The graph passes through the points $(6,0)$ and $(p,0)$. The maximum point has coordinates $(0.5, 30.25)$.



- a) Calculate the value of p . $\frac{6+p}{2} = 0.5$ $6+p=1$ $p=-5$
- b) Given that the quadratic function has an equation $y = -x^2 + bx + c$, find b and c .

$$x = \frac{-b}{2a}$$

$$(2) 0.5 = \frac{-b}{2(-1)} = \frac{b}{2}$$

$$1 = b$$

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

$$0 = -6^2 + 6 + c$$

$$0 = -36 + 6 + c$$

$$0 = -30 + c$$

$$30 = c$$

Homework Assignment:

page 161 (1-5 all)