

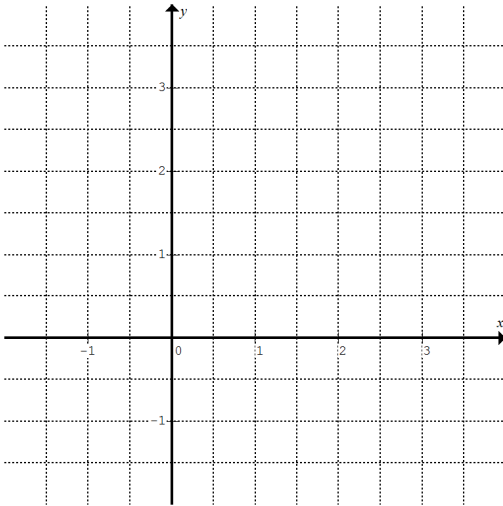


**2018 Year 10 math topic test: Quadratic functions** © itute 2018

Q1 Sketch the graph of each of the following equations. Show the coordinates of the turning points and axis-intercepts.

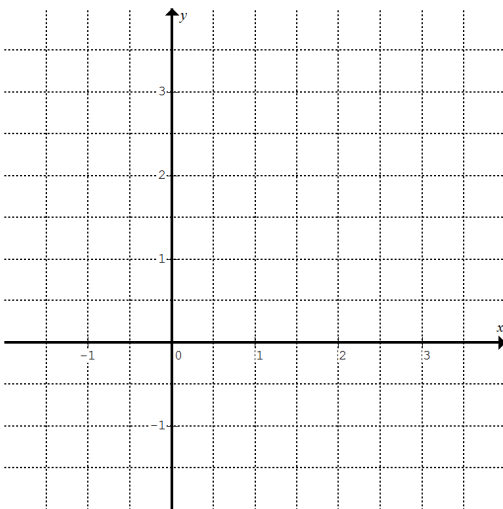
a.  $y = -\frac{(1-x)(x+1)}{2}$

4 marks



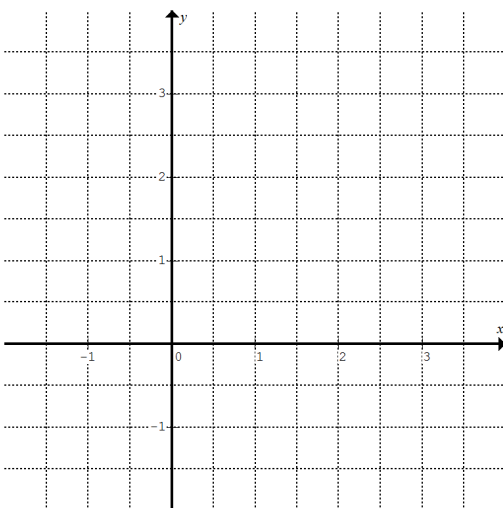
b.  $y = \frac{3-(1-x)^2}{2}$

4 marks



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

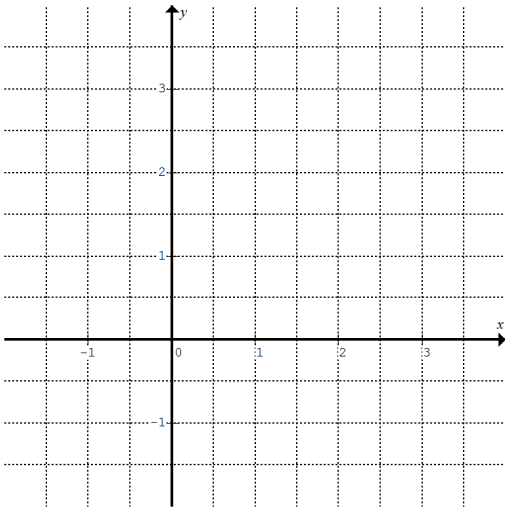
4 marks





d.  $y = 3 + 4x + 2x^2$

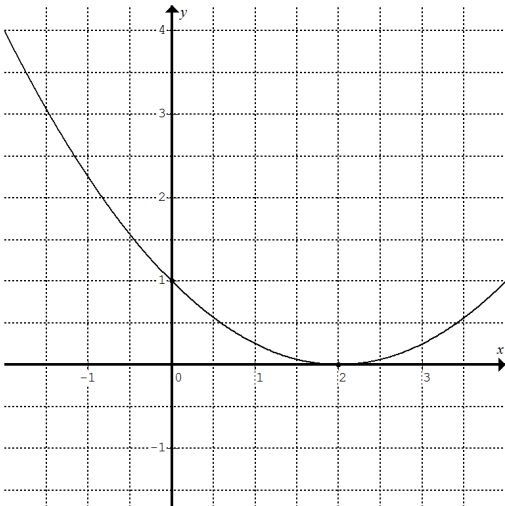
4 marks



Q2 Determine the equation of each of the following functions, graphs or parabolas.

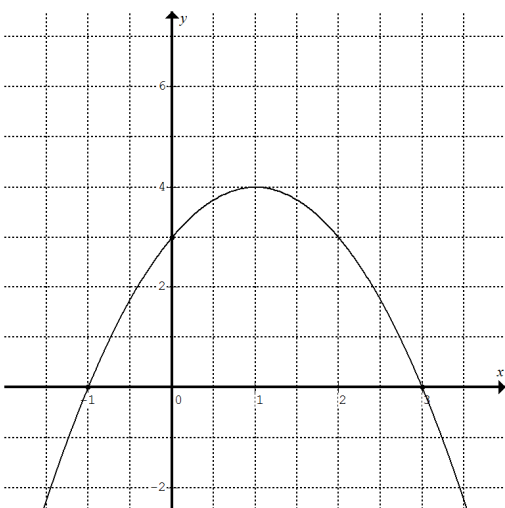
a.

4 marks



b. Write the equation in factorised form.

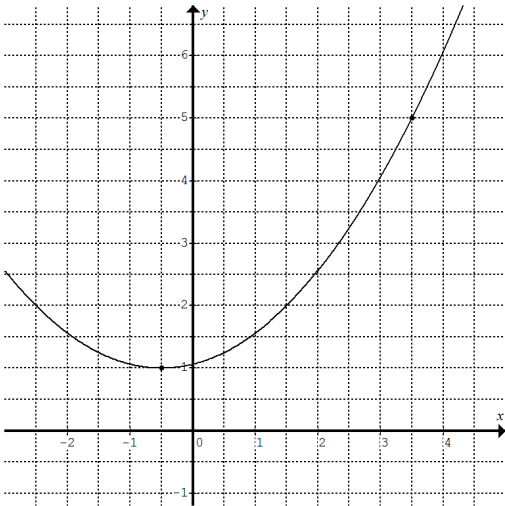
4 marks





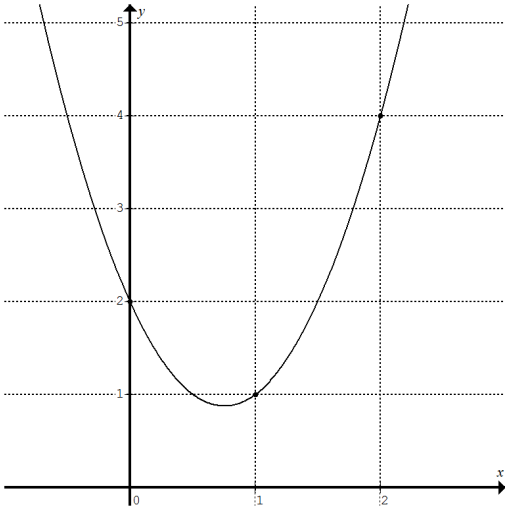
c. Write the equation in turning point form.

4 marks



d. Write the equation in the form  $y = ax^2 + bx + c$ .

5 marks



e. A parabola passes through the point  $(4, 6)$ . It cuts the  $y$ -axis at 2, and has the line  $x = 1$  as its axis of symmetry. Determine the equation of the parabola.

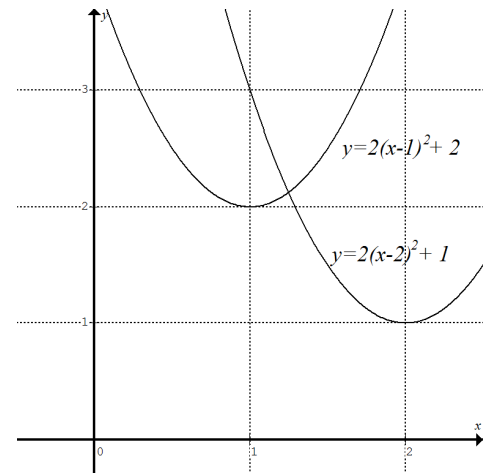
4 marks



Q3 The graphs of  $y = 2(x-1)^2 + 2$  and  $y = 2(x-2)^2 + 1$  for  $x \in R$  are shown below. Both graphs extend to infinity.

a. Find the coordinates of the intersection of the two graphs.

4 marks



b. Consider  $y = 2(x-2+b)^2 + 1$  where  $b$  is a real number.

Find  $b$  so that  $y = 2(x-2+b)^2 + 1$  and  $y = 2(x-1)^2 + 2$  have no intersections.

2 marks

c. Consider  $y = 2(x-2+h)^2 + 1+k$  where  $h$  and  $k$  are real numbers.

Find  $h$  and  $k$  so that  $y = 2(x-2+h)^2 + 1+k$  and  $y = 2(x-1)^2 + 2$  have infinitely many intersections.

2 marks

d. Consider  $y = a(x-2)^2 + 1$  where  $a$  is a real number.

Find the value/s of  $a$  so that  $y = a(x-2)^2 + 1$  and  $y = 2(x-1)^2 + 2$  have only one intersection. 5 marks