Year 9 Quadratics and Parabolas - Practice Test 1

Name: _____ Date: _____

14 questions | 50 marks | 60 minutes

1. Expand and simplify $(x + 3)(x + 2)$. [2 marks]

2. Factorise $x^2 + 7x + 12$. [2 marks]

3. Expand and simplify $(x - 4)(x + 4)$. [2 marks]

4. [3 marks]

(a) Factorise $x^2 - 6x + 9$.

(b) Hence solve $x^2 - 6x + 9 = 0$.

(c) Factorise $x^2 - 5x$ fully.

5. Solve $x^2 - 7x + 12 = 0$. Show your working. [3 marks]

6. Solve $x^2 + 5x + 6 = 0$. Show your working. [3 marks]

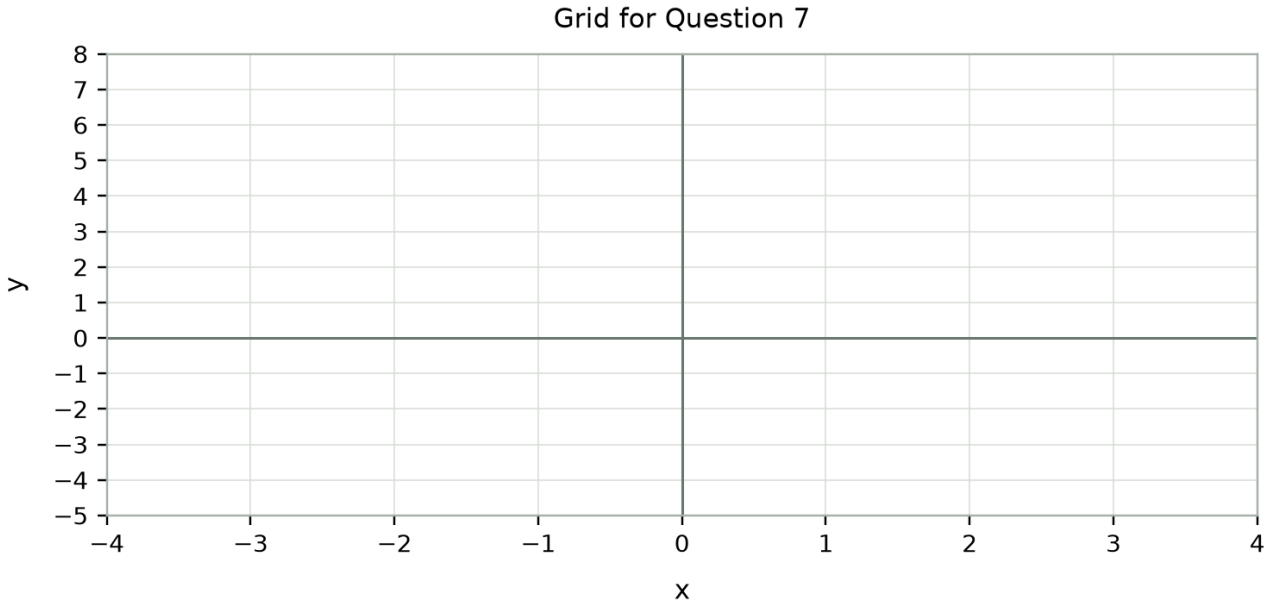
7. Use the rule $y = x^2 - 4$. [4 marks]

Table of values

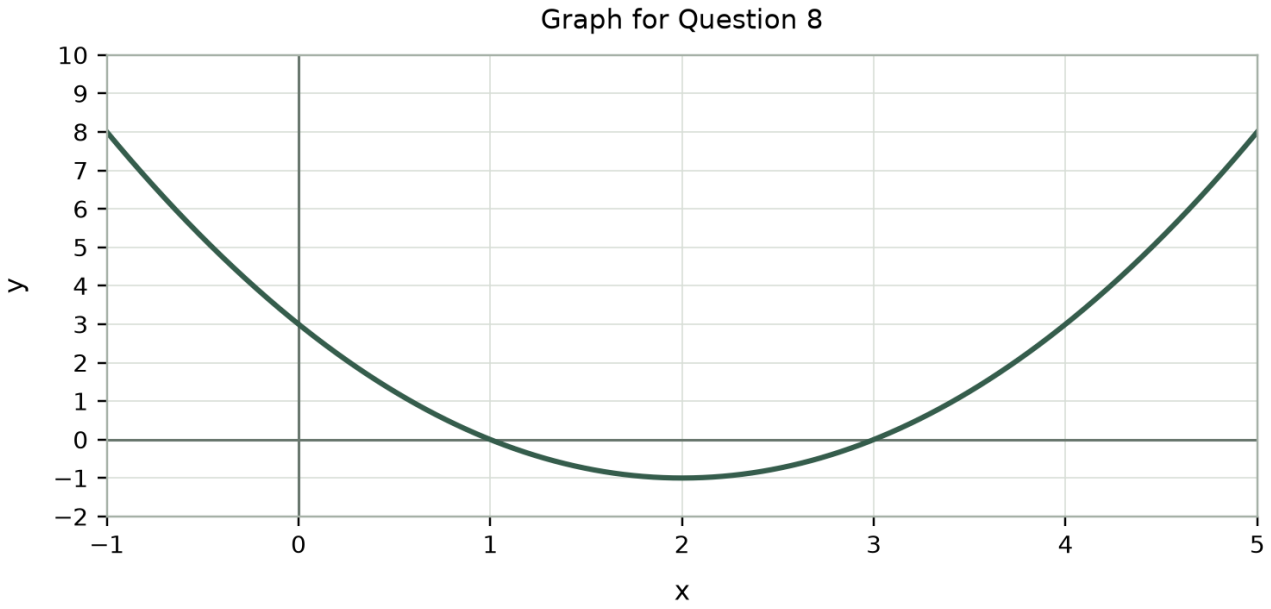
x	-3	-2	-1	0	1	2	3
y							

(a) Complete the table.

(b) Plot the points on the grid and draw a smooth curve through them.



8. Use the graph below. [4 marks]



(a) Write the coordinates of the turning point.

(b) Write the two *x*-intercepts as coordinates.

(c) Write the equation of the line of symmetry.

9. A parabola has rule $y = (x - 3)^2 - 4$. [4 marks]

(a) Write its turning point.

(b) Write its line of symmetry.

(c) Is the turning point a minimum or a maximum? Explain briefly.

10. A parabola has rule $y = (x - 2)(x + 4)$. [4 marks]

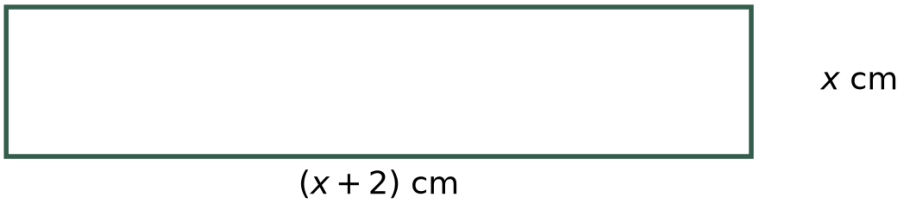
(a) Find its two x-intercepts.

(b) Expand the rule.

(c) Find its y-intercept.

11. The rectangle below has area 48 square centimetres. Its width is x centimetres and its length is $(x + 2)$ centimetres. [5 marks]

Rectangle for Question 11



(a) Write an equation for its area.

(b) Solve the equation.

(c) State the rectangle's width and length. Explain why one solution cannot be used.

12. A rectangular garden has perimeter 24 metres. Its width is x metres. [5 marks]

(a) Write its length in terms of x.

(b) Show that its area is $A = 12x - x^2$.

(c) The area is 35 square metres. Find the two possible values of x.

(d) Explain why these two values describe the same pair of garden dimensions.

13. In an animation, a ball's height is modelled by $h = t(6 - t)$ for $0 \leq t \leq 6$. Here h is the height in metres and t is the time in seconds. [5 marks]

(a) Find the height at $t = 2$.

(b) Find both times when the ball is at ground level.

(c) Use symmetry to find when the ball reaches its greatest height, then find that height.

14. Mia solves $(x + 1)(x - 4) = 0$ by dividing both sides by $x + 1$. She writes $x = 4$ as the only solution. [4 marks]

(a) Give both solutions to the original equation.

(b) Check the missing solution in the original equation.

(c) Why is it unsafe to divide by $x + 1$ here?