Unicorn Race: Quadratics Challenge

Time: 40 min Total: 24 marks Two-sided: questions continue on the back

QUAD-C1

NAME or INITIALS (BLOCK CAPITALS, one letter per box)

ANSWER KEY — not for students, do not scan

ANSWERS — write each final answer in its box. Only these boxes are marked.

1	$x = 1,\ x = 3$	2	$x = \pm 11$	3	$x = 6,\ x = -7$
4	$x = -\frac{1}{3}$	5	$x = 6,\ x = -\frac{2}{3}$	6	$x = -3,\ x = -5$
7	$2(x+1)^2 - 3$	8	$(-2,\ -3)$	9	$x = 1,\ x = -5$
10	$(2, 1),\ (4, 5)$	11	$x = 0,\ x = 2$	12	$x = 2$

1 Solve by factorising: **1 mark**

$$x^2 - 4x + 3 = 0$$

$x = 1,\ x = 3$

answer in box 1 on the front

2 Solve by factorising: **1 mark**

$$x^2 - 121 = 0$$

$x = \pm 11$

answer in box 2 on the front

3 Solve by factorising: **1 mark**

$$x^2 + x - 42 = 0$$

$x = 6,\ x = -7$

answer in box 3 on the front

4 Solve: **1 mark**

$$9x^2 + 6x + 1 = 0$$

$x = -\frac{1}{3}$

answer in box 4 on the front

5 Solve: **2 marks**

$$3x^2 - 4 = 16x + 8$$

$x = 6,\ x = -\frac{2}{3}$

answer in box 5 on the front

Questions continue on the back. Only the answer boxes above are marked.

6 Solve: **2 marks**

$$x + 8 = -\frac{15}{x}$$

$x = -3,\ x = -5$

answer in box 6 on the front

7 Write in the form $a(x-h)^2 + k$: **2 marks**

$$2x^2 + 4x - 1$$

$2(x+1)^2 - 3$

answer in box 7 on the front

8 Find the coordinates of the vertex of the parabola **2 marks**

$$y = -2x^2 - 8x - 11$$

$(-2,\ -3)$

answer in box 8 on the front

9 Solve by completing the square: **3 marks**

$$3x^2 + 12x = 15$$

$x = 1,\ x = -5$

answer in box 9 on the front

10 Find the coordinates of the points where the curve meets the line: **3 marks**

$$y = x^2 - 4x + 5, \quad y = 2x - 3$$

$(2, 1),\ (4, 5)$

answer in box 10 on the front

11 Solve: **3 marks**

$$2^{2x} - 5 \cdot 2^x + 4 = 0$$

$x = 0,\ x = 2$

answer in box 11 on the front

12 Solve, checking your answers: **3 marks**

$$\sqrt{x+2} = x$$

$x = 2$

answer in box 12 on the front