Unicorn Race: Solving Quadratics

Time: 30 min Total: 21 marks Two-sided: questions continue on the back

QUAD-S1

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	$x = -2,\ x = -3$	2	$x = \pm 4$	3	$x = 0,\ x = 7$
4	$x = 3$	5	$x = \frac{1}{2},\ x = 3$	6	$x = 5,\ x = -2$
7	$x = -2 \pm \sqrt{5}$	8	no real solutions	9	20
10	8	11	$(x-5)^2 - 18$	12	12

1 Solve: **1 mark**

$$x^2 + 5x + 6 = 0$$

$x = -2,\ x = -3$

answer in box 1 on the front

2 Solve: **1 mark**

$$x^2 - 16 = 0$$

$x = \pm 4$

answer in box 2 on the front

3 Solve: **1 mark**

$$x^2 - 7x = 0$$

$x = 0,\ x = 7$

answer in box 3 on the front

4 Solve: **1 mark**

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

$x = 3$

answer in box 4 on the front

5 Solve: **2 marks**

$$2x^2 - 7x + 3 = 0$$

$x = \frac{1}{2},\ x = 3$

answer in box 5 on the front

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

6 Solve: **2 marks**

$$x^2 = 3x + 10$$

$x = 5,\ x = -2$

answer in box 6 on the front

7 Solve, giving your answers in exact form: **3 marks**

$$x^2 + 4x - 1 = 0$$

$x = -2 \pm \sqrt{5}$

answer in box 7 on the front

8 Solve, or explain why there are no real solutions: **2 marks**

$$x^2 + 2x + 5 = 0$$

no real solutions

answer in box 8 on the front

9 Find the value of the discriminant of **1 mark**

$$x^2 - 6x + 4$$

20

answer in box 9 on the front

10 This equation has exactly one real solution, and $k > 0$. Find k. **2 marks**

$$x^2 + kx + 16 = 0$$

8

answer in box 10 on the front

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

$$x^2 - 10x + 7$$

$(x - 5)^2 - 18$

answer in box 11 on the front

12 The product of two consecutive positive even integers is 168. Find the smaller integer. **3 marks**

12

answer in box 12 on the front