

Solving Quadratic Equations: math test solutions, Grade 9 – download the PDF

Test solutions with the detailed point scale. Add up your points and spot what to review.

Suggested time: 45 minutes. Out of 20 points. Calculator allowed only when the problem says so.

1 Square root method

/ 3 pts

a) $x^2 = 25$, so $x = \pm 5$. (1 pt)

b) $x + 2 = \pm\sqrt{20} = \pm 2\sqrt{5}$ (1 pt), so $x = -2 \pm 2\sqrt{5}$, about 2.47 or -6.47. (1 pt)

2 Completing the square

/ 4 pts

a) $x^2 - 12x = -20$, add 36: $(x - 6)^2 = 16$ (1 pt), so $x = 10$ or $x = 2$. (1 pt)

b) Divide by 3: $x^2 + 2x = \frac{1}{3}$; add 1: $(x + 1)^2 = \frac{4}{3}$ (1 pt); $x = -1 \pm \frac{2\sqrt{3}}{3}$, about 0.15 or -2.15. (1 pt)

3 Quadratic formula and discriminant

/ 4 pts

a) $\Delta = 49 - 24 = 25$ (1 pt). $x = \frac{7 \pm 5}{4}$ (1 pt), so $x = 3$ or $x = \frac{1}{2}$. (1 pt)

b) $\Delta = 64 - 68 = -4 < 0$: no real solution. (1 pt)

4 A parameter

/ 3 pts

One solution means $\Delta = 0$: $100 - 4k = 0$ (1 pt), so $k = 25$ (1 pt).

Then $x^2 - 10x + 25 = (x - 5)^2 = 0$, so $x = 5$. (1 pt)

5 A poster

/ 3 pts

Let w be the width in inches: $w(w + 6) = 187$, so $w^2 + 6w - 187 = 0$. (1 pt)

$\Delta = 36 + 748 = 784 = 28^2$, $w = \frac{-6 \pm 28}{2}$, so $w = 11$ or $w = -17$. (1 pt)

The width is positive: the poster is 11 in by 17 in. Check: $11 \times 17 = 187$. (1 pt)

6 Line and parabola

/ 3 pts

$x^2 - 1 = x + 1$, so $x^2 - x - 2 = 0$ (1 pt), $(x - 2)(x + 1) = 0$, so $x = 2$ or $x = -1$. (1 pt)

Then $y = 3$ or $y = 0$: the solutions are $(2, 3)$ and $(-1, 0)$. (1 pt)



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