

Algebra 2 - Solving Quadratic Equations - Test Answer Key

Common Core A-REI.B.4a, A-REI.B.4b · maths-pdf.fr/en/

Use this answer key and scoring guide to grade the test on solving quadratic equations (A-REI.B.4a). Each solution shows the full reasoning, and the scoring note explains how many points to award for correct setup, correct work, and a correct final answer. Partial credit rewards a sound method even when a small arithmetic slip changes the result.

Algebra 2 · Common Core State Standards: **A-REI.B.4a, A-REI.B.4b**

Question 1 - Square roots [2 pts]

$$(x+2)^2=16, \text{ so } x+2=\pm 4.$$

$$x=2,-6$$

Scoring: 1 point for isolating the square, 1 point for both solutions.

Question 2 - Factoring [2 pts]

$$(3x+1)(x-4)=0.$$

$$x=-\frac{1}{3}, 4$$

Scoring: 1 point for the factorization, 1 point for both solutions.

Question 3 - Complete the square [3 pts]

$$x^2-10x=-4. \text{ Add 25: } (x-5)^2=21.$$

$$x=5\pm\sqrt{21}.$$

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Scoring: 1 point for adding 25 to both sides, 1 point for the square, 1 point for the solutions.

Question 4 - Quadratic formula [3 pts]

Identify $a=2, b=-3, c=-4$.

Discriminant: $b^2-4ac=(-3)^2-4(2)(-4)=41$.

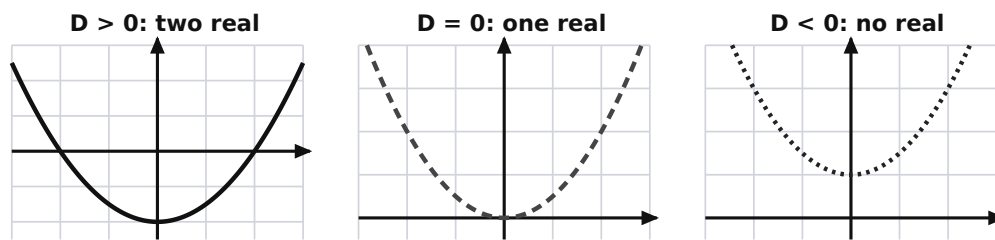
Substitute: $x = \frac{-(-3) \pm \sqrt{41}}{2(2)}$.

$$\sqrt{41} = \sqrt{41}.$$

$$x = \frac{3-\sqrt{41}}{4} \text{ or } x = \frac{3+\sqrt{41}}{4}$$

Scoring: 1 point for the substitution, 1 point for the discriminant, 1 point for the simplified solutions.

Question 5 - Number of solutions [2 pts]



The sign of the discriminant tells how many times the parabola meets the x-axis.

$x^2-4=0$: $D=16>0$, two real. $x^2=0$: $D=0$, one real. $x^2+2=0$: $D=-8<0$, none real.

Two, one, none

Scoring: 1 point for the correct counts, 1 point for the discriminants.

Question 6 - Complex solutions [2 pts]

Identify $a=1, b=4, c=8$.

Discriminant: $b^2-4ac=(4)^2-4(1)(8)=-16$.

Substitute: $x = \frac{-(4) \pm \sqrt{-16}}{2(1)}$.

$\sqrt{-16}=4i$: the solutions are complex.

$$x = -2+2i \text{ or } x = -2-2i$$

Scoring: 1 point for the discriminant, 1 point for the complex solutions.

Question 7 - Rectangle [2 pts]

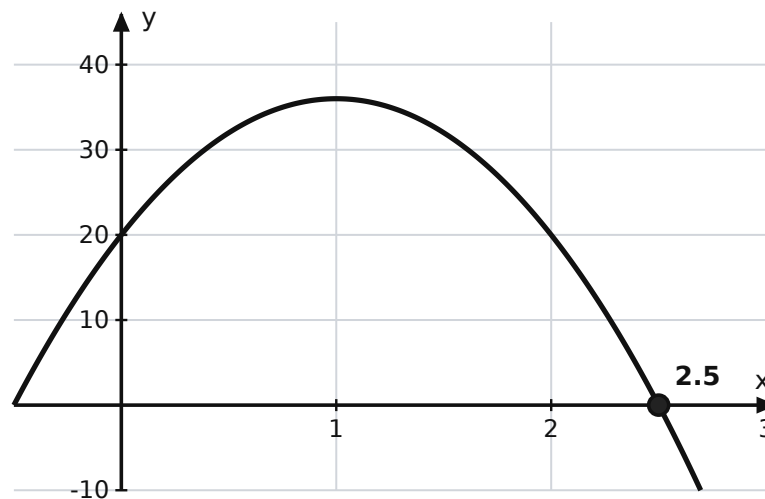
$$w(w+5)=84, \text{ so } w^2+5w-84=0, (w+12)(w-7)=0.$$

Only $w=7$ is valid.

7 m by 12 m

Scoring: 1 point for the equation, 1 point for the dimensions.

Question 8 - Falling object [2 pts]



The object lands at $t = 2.5$.

$$-16t^2+32t+20=0 \text{ becomes } 4t^2-8t-5=0.$$

$$t = \frac{8 \pm \sqrt{64+80}}{8} = \frac{8 \pm 12}{8}, \text{ so } t = \frac{5}{2} \text{ or } t = -\frac{1}{2}.$$

At $t = 2.5$ seconds

Scoring: 1 point for the equation, 1 point for choosing the positive solution.

Question 9 - Find the parameter [2 pts]

$$D=36-4k>0, \text{ so } 4k<36.$$

$$k<9$$

Scoring: 1 point for the discriminant inequality, 1 point for the answer.

Total
20 points