

Algebra 2 - Radical and Rational Equations - Test Answer Key

Common Core A-REI.A.2 · maths-pdf.fr/en/

Use this answer key and scoring guide to grade the test on radical and rational equations (A-REI.A.2). 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.A.2**

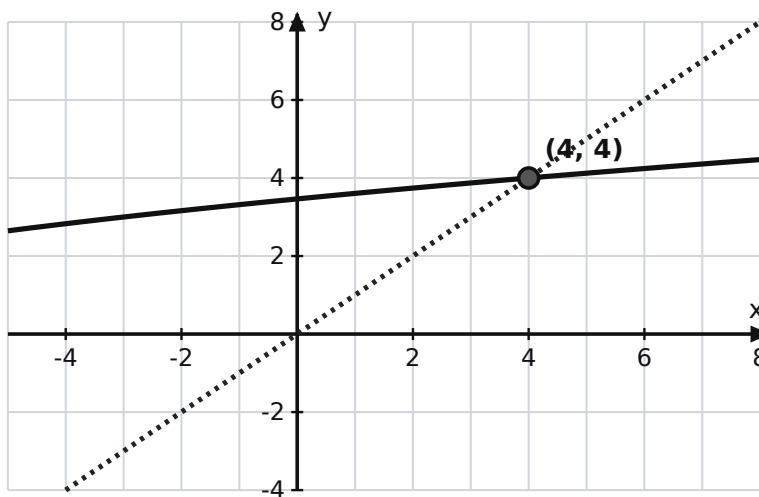
Question 1 - Basic radical equation [1 pt]

$$3x+1=49, \text{ so } x=16.$$

$$x=16$$

Scoring: 1 point for the correct solution with a check.

Question 2 - Extraneous solution [3 pts]



Only $x = 4$ is a solution.

$$x+12=x^2, \text{ so } x^2-x-12=0 \text{ and } (x-4)(x+3)=0.$$

$$\text{Check } x=4: \sqrt{16}=4. \text{ Check } x=-3: \sqrt{9}=3 \neq -3.$$

$$x=4; x=-3 \text{ is extraneous}$$

Scoring: 1 point for squaring and solving, 1 point for checking, 1 point for identifying the extraneous solution.

Question 3 - Rational equation [2 pts]

Cross multiply: $5x = 2(x+1)$, so $3x = 2$.

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

Scoring: 1 point for clearing fractions, 1 point for the solution.

Question 4 - No solution [3 pts]

Multiply by $x+3$: $x = -3 + 2(x+3)$, so $x = 2x+3$ and $x = -3$.

But $x = -3$ makes the denominator 0.

No solution; $x = -3$ is extraneous

Scoring: 1 point for clearing fractions, 1 point for solving, 1 point for rejecting $x = -3$.

Question 5 - Binomial equals radical [2 pts]

$x^2 - 6x + 9 = x - 1$, so $x^2 - 7x + 10 = 0$ and $(x-2)(x-5) = 0$.

Check $x = 5$: $2 = 2$. Check $x = 2$: $-1 = 1$, false.

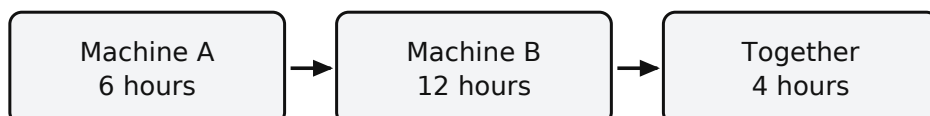
$$x = 5$$

Scoring: 1 point for squaring and solving, 1 point for checking.

Question 6 - Two machines [3 pts]

$\frac{1}{x} + \frac{1}{x+6} = \frac{1}{4}$. Multiply by $4x(x+6)$: $4(x+6) + 4x = x(x+6)$.

$8x + 24 = x^2 + 6x$, so $x^2 - 2x - 24 = 0$ and $(x-6)(x+4) = 0$.



$$1/6 + 1/12 = 1/4.$$

6 hours

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

Question 7 - Free fall [2 pts]

$$\sqrt{h} = 20, \text{ so } h = 400.$$

400 feet

Scoring: 1 point for isolating the root, 1 point for the answer.

Question 8 - Cube root [2 pts]

Cube both sides: $x+2=27$.

$$x = 25$$

Scoring: 1 point for cubing both sides, 1 point for the solution.

Question 9 - Check by substitution [2 pts]

A solution makes both columns equal: only $x=5$ gives $3=3$.

$$x = 5$$

Scoring: 1 point for comparing the columns, 1 point for the answer.

Total

20 points
