

Algebra 2 - Rational Expressions - Test Answer Key

Common Core A-APR.D.7, A-SSE.A.2 · maths-pdf.fr/en/

Use this answer key and scoring guide to grade the test on rational expressions (A-APR.D.7). 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-APR.D.7, A-SSE.A.2**

Question 1 - Excluded values [2 pts]

$$x^2 - 3x - 10 = (x - 5)(x + 2), \text{ so } x \neq 5, -2.$$

$$\frac{x-5}{(x-5)(x+2)} = \frac{1}{x+2}.$$

$$x \neq 5, -2; \frac{1}{x+2}$$

Scoring: 1 point for the excluded values, 1 point for the simplified form.

Question 2 - Simplify [2 pts]

$$\frac{(x+5)(x-3)}{(x-3)(x+3)}.$$

$$\frac{x+5}{x+3}$$

Scoring: 1 point for factoring, 1 point for the result.

Question 3 - Multiply [2 pts]

$$\frac{2x}{x+4} \cdot \frac{(x-4)(x+4)}{6x} = \frac{2(x-4)}{6}$$

$$\frac{x-4}{3}$$

Scoring: 1 point for factoring, 1 point for the result.

Question 4 - Divide [2 pts]

$$\frac{(x-2)(x+2)}{x+3} \cdot \frac{(x+3)^2}{x+2} = (x-2)(x+3).$$

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

Scoring: 1 point for the reciprocal, 1 point for the simplified product.

Question 5 - Add [3 pts]

$$\text{LCD } (x-3)(x+1): \frac{2(x+1)+4(x-3)}{(x-3)(x+1)} = \frac{2x+2+4x-12}{(x-3)(x+1)}.$$

$$\frac{6x-10}{(x-3)(x+1)}$$

Scoring: 1 point for the common denominator, 1 point for the numerators, 1 point for the simplified result.

Question 6 - Complex fraction [2 pts]

Multiply the top and bottom by $3x$: $\frac{3+x}{3-x}$.

$$\frac{3+x}{3-x}$$

Scoring: 1 point for multiplying by the LCD, 1 point for the result.

Question 7 - Two pumps [2 pts]

Fraction of the job done in 1 hour

A	1/6	
D	1/4	
together 5/12		

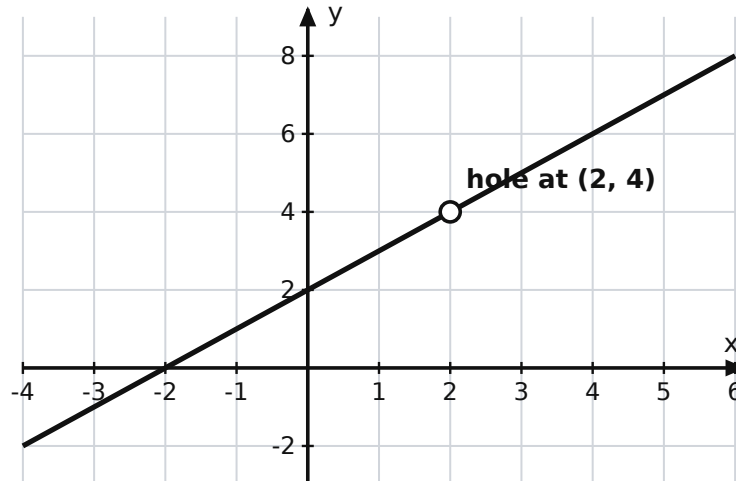
Aisha paints 1/6 of the fence per hour and Diego 1/4 per hour: together 5/12.

$\frac{1}{6} + \frac{1}{4} = \frac{5}{12}$ of the tank per hour, so $t = \frac{12}{5}$ hours.

2.4 hours

Scoring: 1 point for the combined rate, 1 point for the time.

Question 8 - Structure and holes [3 pts]



$y = (x^2 - 4)/(x - 2)$ is the line $y = x + 2$ with a hole at $x = 2$.

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

Excluded: $x^2 - 4 = 0$ gives $x = \pm 2$.

$$g(x) = x^2 + 4; x \neq 2, -2$$

Scoring: 1 point for the factorization, 1 point for the simplified form, 1 point for the excluded values.

Question 9 - Find the error [2 pts]

At $x = 6$: $\frac{12}{6} = 2$ but $6 + 1 = 7$. The values differ, so the claim is false.

Correct: $\frac{x+6}{6} = \frac{x}{6} + 1$.

False; the correct form is $x/6 + 1$

Scoring: 1 point for the counterexample, 1 point for the correct form.

Total

20 points