

# Algebra 2 · Rational Expressions and Equations

## · Test

Common Core A-APR.D.6, A-APR.D.7, A-REI.A.2 · mathovore.fr

Name: \_\_\_\_\_ Date: \_\_\_\_/\_\_\_\_/\_\_\_\_ Score: \_\_\_\_\_

This 45-minute test has 8 questions worth 20 points in total. It covers simplifying rational expressions, operations, rational equations with extraneous solutions, and work and rate problems. Show every step; a calculator is not required.

### Test information

- **Grade:** Algebra 2
- **Chapter:** Rational Expressions and Equations
- **Common Core:** A-APR.D.6, A-APR.D.7, A-REI.A.2
- **Time:** 45 minutes
- **Total:** 20 points (Question 1: 2 pts; Question 2: 2 pts; Question 3: 3 pts; Question 4: 2 pts; Question 5: 3 pts; Question 6: 2 pts; Question 7: 3 pts; Question 8: 3 pts)

### Question 1: Simplify and restrict (2 points)

Simplify  $\frac{x^2-x-12}{x^2-16}$  and state all excluded values of  $x$ .

### Question 2: Divide rational expressions (2 points)

Simplify  $\frac{x^2-25}{x^2+2x} \div \frac{x+5}{x+2}$  and state the excluded values.

### Question 3: Add and subtract (3 points)

Simplify each expression.

- $\frac{3}{x+2} + \frac{4}{x-1}$  (1 point)
- $\frac{x}{x^2-4} - \frac{2}{x-2}$  (2 points)

### Question 4: Rewrite a rational expression (2 points)

Rewrite  $\frac{x^2+5x+1}{x+2}$  in the form  $q(x) + \frac{r}{x+2}$ .

### Question 5: Solve and check (3 points)

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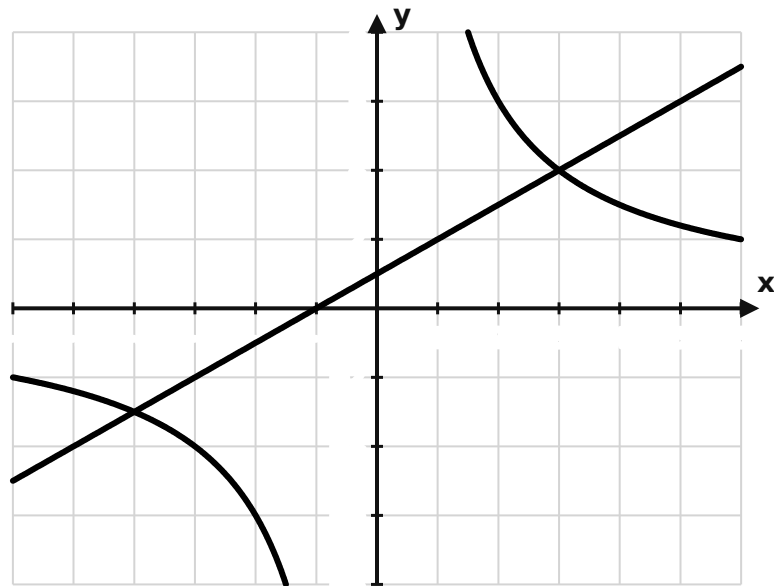
Consider the equation  $\frac{x^2}{x-4} = \frac{3x+4}{x-4}$ .

- Find all values of  $x$  that result from clearing the denominators. (2 points)
- Identify any extraneous solution and explain why it is extraneous. (1 point)

### Question 6: Equation and graph (2 points)

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The graphs of  $y = \frac{12}{x}$  and  $y = x+1$  are shown.



The graphs of  $y = \frac{12}{x}$  and  $y = x+1$ .

- Solve  $\frac{12}{x} = x+1$  algebraically. (1 point)
- Write the coordinates of the two intersection points. (1 point)

### Question 7: Washing the vans (3 points)

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Diego can wash all the team vans in 10 hours. Liam can wash them in 15 hours.

|       |          |
|-------|----------|
| Diego | 10 hours |
| Liam  | 15 hours |

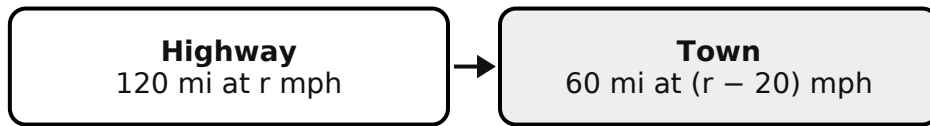
Time to wash all the vans alone.

- Write an equation for the time  $t$  in hours needed if they work together. (1 point)
- Solve the equation. (2 points)

### Question 8: Road trip (3 points)

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Aisha drives 120 miles on the highway at  $r$  mph and then 60 miles through town at  $(r-20)$  mph. The total driving time is 3.5 hours.



Total driving time is 3.5 hours.

- Write an equation for the total time. (1 point)
- Find the highway speed  $r$ . (2 points)