

Part I: Solve for x in each of these equations.

1. $\frac{6x^3 + 24x^2 - 30x}{6x^2 - 6x} = 8$

2. $\frac{12x^4 - 60x^3}{2x - 10} = 48$

3. $\frac{8x^3 - 12x^2}{4x^2} = 7$

4. $\frac{2}{3x} = \frac{x+1}{18}$

5. $\frac{8}{1-x} = -4x$

6. $\frac{x-5}{3} = \frac{-x}{12}$

7. $\frac{x^3 - 36x}{x^3 - 9x^2 + 18x} \cdot \frac{9x^2 - 9x - 54}{3x + 6} = 33$

Part II: Find the LCD for each of these pairs of fractions.

$\frac{1}{2x}, \frac{x}{2}$

$\frac{4}{3x^2}, \frac{6}{5x}$

$\frac{1}{8x^2 + 64x}, \frac{9}{2x^3}$

$\frac{5}{3x+3}, \frac{7}{2x+2}$

$\frac{1}{2x+2}, \frac{7}{2x+6}$

$\frac{1}{x+7}, \frac{8}{4x^4}$

$\frac{3}{x^2+16}, \frac{1}{2x+8}$

$-\frac{3}{3x-15}, \frac{1}{x^2-4x-15}$

$\frac{1}{3x-9}, \frac{4}{2x^2-22x+48}$

Part III: Regents problems.

1. Perform the indicated operation and express the result in simplest terms:

$$\frac{x}{x+3} \div \frac{3x}{x^2-9}$$

2. A rectangular prism has a length of $\frac{2x^2 + 2x - 24}{4x^2 + x}$, a width of $\frac{x^2 + x - 6}{x + 4}$, and a height of $\frac{8x^2 + 2x}{x^2 - 9}$. For all values of x for which it is defined, express, in terms of x , the volume of the prism in simplest form.

3. If the length of a rectangular garden is represented by $\frac{x^2 + 2x}{x^2 + 2x - 15}$ and its width is represented by $\frac{2x - 6}{2x + 4}$, which expression represents the area of the garden?

[A] x [B] $x + 5$ [C] $\frac{x}{x + 5}$ [D] $\frac{x^2 + 2x}{2(x + 5)}$

4. Express in simplest form: $\frac{4x + 8}{x + 1} \cdot \frac{2 - x}{3x - 15} \div \frac{x^2 - 4}{2x^2 - 8x - 10}$

5. Expressed as a single fraction, what is $\frac{1}{x+1} + \frac{1}{x}$, $x \neq 0, -1$?

6. Express in simplest form: $\frac{1}{x} + \frac{1}{x+3}$

7. What is the sum of $(y - 5) \div \frac{3}{y+2}$? [A] $y - 5$ [B] $\frac{y^2 - 3y - 7}{y + 2}$ [C] $\frac{y - 2}{y + 2}$ [D] $\frac{y^2 - 7}{y + 2}$

8. What is the sum of $\frac{3}{x - 3}$ and $\frac{x}{3 - x}$? [A] 1 [B] 0 [C] -1 [D] $\frac{x + 3}{x - 3}$

9. What is the least common denominator of $\frac{1}{2}$, $\frac{2}{7x}$, and $\frac{5}{x}$?

10. The expression $\frac{y}{x} - \frac{1}{2}$ is equivalent to [A] $\frac{1 - y}{2x}$ [B] $\frac{y - 1}{x - 2}$ [C] $\frac{2y - x}{2x}$ [D] $\frac{x - 2y}{2x}$

11. What is the sum of $\frac{2}{x}$ and $\frac{x}{2}$? [A] $\frac{4 + x^2}{2x}$ [B] 1 [C] $\frac{2 + x}{2x}$ [D] $\frac{4 + x}{2x}$