

Find the LCM of each set of polynomials.

18. $24cd, 40a^2c^3d^4, 15abd^3$

20. $x^2 - 9x + 20, x^2 + x - 30$

19. $4x^2y^3, 18xy^4, 10xz^2$

21. $6x^2 + 21x - 12, 4x^2 + 22x + 24$

MP PERSEVERANCE Simplify each expression.

22. $\frac{5a}{24cf^4} + \frac{a}{36bc^4f^3}$

24. $\frac{5b}{6a} + \frac{3b}{10a^2} + \frac{2}{ab^2}$

26. $\frac{8}{3y} + \frac{2}{9} - \frac{3}{10y^2}$

28. $\frac{8}{x^2 - 6x - 16} + \frac{9}{x^2 - 3x - 40}$

30. $\frac{12}{3y^2 - 10y - 8} - \frac{3}{y^2 - 6y + 8}$

32. $\frac{2x}{4x^2 + 9x + 2} + \frac{3}{2x^2 - 8x - 24}$

23. $\frac{4b}{15x^3y^2} - \frac{3b}{35x^2y^4z}$

25. $\frac{4}{3x} + \frac{8}{x^3} + \frac{2}{5xy}$

27. $\frac{1}{16a} + \frac{5}{12b} - \frac{9}{10b^3}$

29. $\frac{6}{y^2 - 2y - 35} + \frac{4}{y^2 + 9y + 20}$

31. $\frac{6}{2x^2 + 11x - 6} - \frac{8}{x^2 + 3x - 18}$

33. $\frac{4x}{3x^2 + 3x - 18} - \frac{2x}{2x^2 + 11x + 15}$

5 Simplify each expression.

$$36. \frac{\frac{2}{x-3} + \frac{3x}{x^2-9}}{\frac{3}{x+3} - \frac{4x}{x^2-9}}$$

$$38. \frac{\frac{5}{x+6} - \frac{2x}{2x-1}}{\frac{x}{2x-1} + \frac{4}{x+6}}$$

40. OIL PRODUCTION Managers of an oil company have estimated that oil will be pumped from a certain well at a rate based on the function $R(x) = \frac{20}{x} + \frac{200x}{3x^2 + 20}$, where $R(x)$ is the rate of production in thousands of barrels per year x years after pumping begins.

a. Simplify $R(x)$.

b. At what rate will oil be pumping from the well in 50 years?

Find the LCM of each set of polynomials.

$$41. 12xy^4, 14x^4y^2, 5xyz^3, 15x^5y^3$$

$$43. x^2 - 3x - 28, 2x^2 + 9x + 4, x^2 - 16$$

$$42. -6abc^2, 18a^2b^2, 15a^4c, 8b^3$$

$$44. x^2 - 5x - 24, x^2 - 9, 3x^2 + 8x - 3$$

Simplify each expression.

$$45. \frac{1}{12a} + 6 - \frac{3}{5a^2}$$

$$47. \frac{5}{6x^2 + 46x - 16} + \frac{2}{6x^2 + 57x + 72}$$

$$49. \frac{x^2 + y^2}{x^2 - y^2} + \frac{y}{x + y} - \frac{x}{x - y}$$

$$51. \frac{\frac{2}{a-1} + \frac{3}{a-4}}{\frac{6}{a^2 - 5a + 4}}$$

$$46. \frac{5}{16y^2} - 4 - \frac{8}{3x^2y}$$

$$48. \frac{1}{8x^2 - 20x - 12} + \frac{4}{6x^2 + 27x + 12}$$

$$50. \frac{x^2 + x}{x^2 - 9x + 8} + \frac{4}{x - 1} - \frac{3}{x - 8}$$

$$52. \frac{\frac{1}{x} + \frac{1}{y}}{\left(\frac{1}{x} - \frac{1}{y}\right)(x + y)}$$



2 Solve each equation. Check your solution.

1. $\frac{4}{7} + \frac{3}{x-3} = \frac{53}{56}$

3. $\frac{10}{2x+1} + \frac{4}{3} = 2$

5. $\frac{8}{x-5} - \frac{9}{x-4} = \frac{5}{x^2 - 9x + 20}$

7. $\frac{14}{x-8} - \frac{5}{x-6} = \frac{82}{x^2 - 14x + 48}$

2. $\frac{7}{3} - \frac{3}{x-5} = \frac{19}{12}$

4. $\frac{11}{4} - \frac{5}{y+3} = \frac{23}{12}$

6. $\frac{14}{x+3} + \frac{10}{x-2} = \frac{122}{x^2 + x - 6}$

8. $\frac{5}{x+2} - \frac{3}{x-2} = \frac{12}{x^2 - 4}$

2 Solve each equation. Check your solutions.

$$16. \frac{9}{x-7} - \frac{7}{x-6} = \frac{13}{x^2 - 13x + 42}$$

$$18. \frac{14}{x-2} - \frac{18}{x+1} = \frac{22}{x^2 - x - 2}$$

$$20. \frac{x}{2x-1} + \frac{3}{x+4} = \frac{21}{2x^2 + 7x - 4}$$

$$17. \frac{13}{y+3} - \frac{12}{y+4} = \frac{18}{y^2 + 7y + 12}$$

$$19. \frac{11}{a+2} - \frac{10}{a+5} = \frac{36}{a^2 + 7a + 10}$$

$$21. \frac{2}{y-5} + \frac{y-1}{2y+1} = \frac{2}{2y^2 - 9y - 5}$$