

Practice with Algebraic Fractions #3

1. Simplify $\frac{x^2y}{20} \times \frac{4}{y}$
2. Simplify $\frac{x}{6} + \frac{x}{7}$
3. Simplify $\frac{x}{6y} - \frac{x}{y}$
4. Solve $\frac{2}{x+1} = \frac{5}{x-2}$
5. Simplify $\frac{x^2 - x - 30}{x - 6}$
6. Simplify $\frac{3}{k} + 7$
7. Solve $\frac{x}{3} = \frac{5}{x-5}$
8. Make x the subject: $\frac{5}{k} + 1 = \frac{3}{x}$
9. Simplify $\frac{2}{y} + \frac{3}{x^2}$
10. Simplify $\frac{x^2 + x - 6}{x^2 + 6x + 9}$
11. Solve $\frac{2}{x+5} = \frac{5}{x-1}$
12. Simplify $\frac{4}{x+3} - \frac{9}{x-1}$
13. Simplify $\frac{2x - 10}{x^2 + 2x - 35}$
14. Simplify $\frac{7xy}{\frac{3y}{x}}$
15. Simplify $(x^2 + 14x + 40)(x + 4)^{-1}$
16. Solve $\frac{x-1}{x+3} = \frac{6}{x-5}$

Answers: Practice with Algebraic Fractions #3

$$1. \quad \frac{x^2y}{20} \times \frac{4}{y} = \frac{4x^2y}{20y} = \frac{x^2}{5}$$

$$2. \quad \frac{x}{6} + \frac{x}{7} = \frac{7x}{42} + \frac{6x}{42} = \frac{13x}{42}$$

$$3. \quad \frac{x}{6y} - \frac{x}{y} = \frac{x}{6y} + \frac{-6x}{6y} = \frac{-5x}{6y}$$

$$4. \quad \frac{2}{x+1} = \frac{5}{x-2} \Rightarrow 2(x-2) = 5(x+1) \Rightarrow 2x-4 = 5x+5 \Rightarrow x = \frac{-1}{3}$$

$$5. \quad \frac{x^2-x-30}{x-6} = \frac{(x-6)(x+5)}{x-6} = x+5$$

$$6. \quad \frac{3}{k} + 7 = \frac{3}{k} + \frac{7k}{k} = \frac{7k+3}{k}$$

$$7. \quad \frac{x}{3} = \frac{5}{x-2} \Rightarrow x(x-5) = 3 \times 5 \Rightarrow x^2 - 2x - 15 = 0 \Rightarrow x = 5 \text{ or } -3$$

$$8. \quad \frac{5}{k} + 1 = \frac{3}{x} \Rightarrow \frac{5+k}{k} = \frac{3}{x} \Rightarrow x(5+k) = 3k \Rightarrow x = \frac{3k}{5+k}$$

$$9. \quad \frac{2}{y} + \frac{3}{x^2} = \frac{2x^2}{yx^2} + \frac{3y}{x^2y} = \frac{2x^2+3y}{x^2y}$$

$$10. \quad \frac{x^2+x-6}{x^2+6x+9} = \frac{(x+3)(x-2)}{(x+3)(x+3)} = \frac{x-2}{x+3}$$

$$11. \quad \frac{2}{x+5} = \frac{5}{x-1} \Rightarrow 2(x-1) = 5(x+5) \Rightarrow 2x-2 = 5x+25 \Rightarrow x = -9$$

$$12. \quad \frac{4}{x+3} - \frac{9}{x-1} = \frac{4(x-1)}{(x+3)(x-1)} + \frac{-9(x+3)}{(x+3)(x-1)} = \frac{-5x-31}{(x+3)(x-1)}$$

$$13. \quad \frac{2x-10}{x^2+2x-35} = \frac{2(x-5)}{(x+7)(x-5)} = \frac{2}{x+7}$$

$$14. \quad \frac{7xy}{\frac{3y}{x}} = \frac{7xy}{1} \div \frac{3y}{x} = \frac{7xy}{1} \times \frac{x}{3y} = \frac{7x^2}{3}$$

$$15. \quad (x^2+14x+40)(x+4)^{-1} = \frac{x^2+14x+40}{x+4} = \frac{(x+10)(x+4)}{x+4} = x+10$$

$$16. \quad \frac{x-1}{x+3} = \frac{6}{x-5} \Rightarrow (x-1)(x-5) = 6(x+3) \Rightarrow x^2 - 6x + 5 = 6x + 18 \\ \Rightarrow x^2 - 12x - 13 \Rightarrow x = 13 \text{ or } -1$$

Note: Qs 4, 7, 8, 11 and 16 start with equations. Only with these can we multiply across the =.