Practice with Algebraic Fractions #2

1. Simplify $\dfrac{x}{4} \times \dfrac{8}{x^2}$

2. Simplify $\dfrac{x}{2} + \dfrac{x}{7}$

3. Simplify $\dfrac{x}{6} - \dfrac{x}{5}$

4. Simplify $\dfrac{x}{4} \div \dfrac{x^2}{6}$

5. Simplify $\dfrac{6}{k} + \dfrac{5}{jk}$

6. Simplify $\dfrac{x^2 + 7x - 18}{x - 2}$

7. Simplify $\dfrac{2}{x^3} + \dfrac{5}{x^2}$

8. Solve $\dfrac{2}{x - 5} = \dfrac{4}{x}$

9. Simplify $\dfrac{2}{x - 3} - \dfrac{4}{x + 1}$

10. Simplify $\left(\dfrac{x}{4}\right)^{-3}$

11. Solve $\dfrac{x}{x + 4} = \dfrac{x - 3}{x}$

12. Simplify $\dfrac{x + 2}{x^2 - 3x - 15}$

13. Simplify $\dfrac{2}{x - 5} + \dfrac{4x}{3}$

14. Make x the subject: $\dfrac{7}{x} = \dfrac{k + 3}{5}$

15. Simplify $\dfrac{2x^2 + 20x + 50}{x + 5}$

16. Solve $\dfrac{6}{x - 2} = 1 + \dfrac{8}{x}$

Answers: Practice with Algebraic Fractions #2

1. $\dfrac{x}{4} \times \dfrac{8}{x^2}$ $\qquad\qquad\qquad\qquad\qquad = \dfrac{2}{x}$

2. $\dfrac{x}{2} + \dfrac{x}{7}$ $\qquad\quad = \dfrac{7x}{14} + \dfrac{2x}{14}$ $\qquad\quad = \dfrac{9x}{14}$

3. $\dfrac{x}{6} - \dfrac{x}{5}$ $\qquad\quad = \dfrac{5x}{30} - \dfrac{6x}{30}$ $\qquad\quad = \dfrac{-x}{30}$

4. $\dfrac{x}{4} \div \dfrac{x^2}{6}$ $\qquad\quad = \dfrac{x}{4} \times \dfrac{6}{x^2}$ $\qquad\quad = \dfrac{3}{2x}$

5. $\dfrac{6}{k} + \dfrac{5}{jk}$ $\qquad\quad = \dfrac{6j}{jk} + \dfrac{5}{jk}$ $\qquad\quad = \dfrac{2j+5}{jk}$

6. $\dfrac{x^2 + 7x - 18}{x - 2}$ $\qquad = \dfrac{(x-2)(x+9)}{x-2}$ $\qquad = x + 9$

7. $\dfrac{2}{x^3} + \dfrac{5}{x^2}$ $\qquad\quad = \dfrac{2}{x^3} + \dfrac{5x}{x^3}$ $\qquad\quad = \dfrac{5x+2}{x^3}$

8. $\dfrac{2}{x-5} = \dfrac{4}{x}$ $\quad\Rightarrow\quad 2(x) = 4(x-5)$ $\quad\Rightarrow\quad 2x = 4x - 20$ $\quad\Rightarrow\quad x = 10$

9. $\dfrac{2}{x-3} - \dfrac{4}{x+1}$ $\quad = \dfrac{2\,(x+1)}{(x-3)(x+1)} + \dfrac{-4\,(x-3)}{(x-3)(x+1)}$ $\qquad = \dfrac{-2x+14}{(x-3)(x+1)}$

10. $\left(\dfrac{x}{4}\right)^{-3}$ $\qquad\quad = \left(\dfrac{4}{x}\right)^{3}$ $\qquad\quad = \dfrac{4^3}{x^3}$ $\qquad\quad = \dfrac{64}{x^3}$

11. $\dfrac{x}{x+4} = \dfrac{x-3}{x}$ $\quad\Rightarrow\quad x(x) = (x-3)(x+4)$ $\quad\Rightarrow\quad x^2 = x^2 + x - 12$ $\quad\Rightarrow\quad x = 12$

12. $\dfrac{x+2}{x^2 - 3x - 15}$ $\qquad = \dfrac{x+2}{(x+2)(x-5)}$ $\qquad = \dfrac{1}{x-5}$

13. $\dfrac{2}{x-5} + \dfrac{4x}{3}$ $\qquad = \dfrac{3\times 2}{3(x-5)} + \dfrac{4x(x-5)}{3(x-5)}$ $\qquad = \dfrac{4x^2 - 20x + 6}{3(x-5)}$ and then stop!

14. $\dfrac{7}{x} = \dfrac{k+3}{5}$ $\quad\Rightarrow\quad 7 \times 5 = x(k+3)$ $\quad\Rightarrow\quad x = \dfrac{35}{k+3}$

15. $\dfrac{2x^2 + 20x + 50}{x+5}$ $\qquad = \dfrac{2(x+5)(x+5)}{x+5}$ $\qquad = 2x + 10 \ \text{ or } \ 2(x+5)$

16. $\dfrac{6}{x-2} = 1 + \dfrac{8}{x}$ $\Rightarrow$ $\dfrac{6}{x-2} = \dfrac{x+8}{x}$ $\qquad\Rightarrow\qquad 6(x) = (x+8)(x-2)$

$\Rightarrow 6x = x^2 + 6x - 16 \Rightarrow \qquad 0 = x^2 - 16 \quad\Rightarrow\quad x = 4 \text{ or } {}^{-}4$

Note: Qs 8, 11, 14 & 16 start with equations, so we can multiply across the = sign with them.