Solutions

1. Simplify. State any restrictions on the variables.

a) $\frac{2}{3} \times \frac{5}{8}$

$= \frac{2 \times 5}{3 \times 8}$

$= \frac{10}{24}$

$= \frac{5}{12}$

No restrictions

c) $\frac{(x+1)(x-5)}{(x+4)} \times \frac{(x+4)}{2(x-5)}$

$x \neq -4, x \neq 5$

$= \frac{(x+1)\cancel{(x-5)}\cancel{(x+4)}}{2\cancel{(x+4)}\cancel{(x-5)}}$

$= \frac{x+1}{2}$

1. Simplify. State any restrictions on the variables.

b) $\frac{6x^2y}{5y^3} \times \frac{xy}{8}$

$y \neq 0$

$= \frac{6x^3y^2}{40y^3}$

$= \frac{2y^2(3x^3)}{2y^2(20y)}$

$= \frac{3x^3}{20y}$

d) $\frac{x^2}{2x+1} \times \frac{6x+3}{5x}$

$x \neq -\frac{1}{2}, x \neq 0$

$= \frac{(x)(x)(3)(2x+1)}{(2x+1)(5)(x)}$

$= \frac{3x}{5}$

5. Simplify. State any restrictions on the variables.

a) $\frac{2(x+1)}{3} \times \frac{x-1}{6(x+1)}$

$x \neq -1$

$= \frac{2(x+1)(x-1)}{(3)(2)(3)(x+1)}$

$= \frac{x-1}{9}$

c) $\frac{2(x-2)}{9x^3} \times \frac{12x^4}{2-x}$

$x \neq 0, x \neq 2$

$= \frac{2(x-2)(12)(x^4)}{9(x^3)(2-x)}$

$= \frac{24(x-2)(x^4)}{9(x^3)(-1)(x-2)}$

Factor of -1

$= \frac{24x^4}{-9x^3}$

$= \frac{8x}{-3}$

6. Simplify. State any restrictions on the variables.

a) $\dfrac{(x+1)(x-3)}{(x+2)^2} \times \dfrac{2(x+2)}{(x-3)(x+3)}$

$x \neq -2, x \neq 3, -3$

$= \dfrac{(x+1)\cancel{(x-3)}(2)\cancel{(x+2)}}{\cancel{(x+2)}(x+2)\cancel{(x-3)}(x+3)}$

$= \dfrac{2(x+1)}{(x+2)(x+3)}$

6. Simplify. State any restrictions on the variables.

c) $\dfrac{2x^2 - x - 1}{x^2 - x - 6} \times \dfrac{6x^2 - 5x + 1}{8x^2 + 14x + 5}$

$= \dfrac{(2x+1)(x-1)}{(x-3)(x+2)} \times \dfrac{(3x-1)(2x-1)}{(4x+5)(2x+1)}$

$x \neq 3, -2 \qquad x \neq -5/4, -1/2$

$= \dfrac{\cancel{(2x+1)}(x-1)(3x-1)(2x-1)}{(x-3)(x+2)(4x+5)\cancel{(2x+1)}}$

$= \dfrac{(x-1)(3x-1)(2x-1)}{(x-3)(x+2)(4x+5)}$

7. Simplify. State any restrictions on the variables.

a) $\dfrac{x^2 - 5xy + 4y^2}{x^2 + 3xy - 28y^2} \times \dfrac{x^2 + 2xy + y^2}{x^2 - y^2}$

$= \dfrac{(x-4y)(x-y)}{(x+7y)(x-4y)} \times \dfrac{(x+y)(x+y)}{(x+y)(x-y)}$

$x \neq -7y, 4y \qquad x \neq -y, y$

$= \dfrac{\cancel{(x-4y)}\cancel{(x-y)}\cancel{(x+y)}(x+y)}{(x+7y)\cancel{(x-4y)}\cancel{(x+y)}\cancel{(x-y)}}$

$= \dfrac{x+y}{x+7y}$

7. Simplify. State any restrictions on the variables.

d) $\dfrac{15m^2 + mn - 2n^2}{2n - 14m} \times \dfrac{7m^2 - 8mn + n^2}{5m^2 + 7mn + 2n^2}$

$= \dfrac{(3m-n)(5m+2n)}{2(n-7m)} \times \dfrac{(7m-n)(m-n)}{(5m+2n)(m+n)}$

$7m \neq n \qquad 5m \neq -2n \quad m \neq -n$

$m \neq \frac{1}{7}n \qquad m \neq -\frac{2n}{5}$

$= \dfrac{(3m-n)\cancel{(5m+2n)}(7m-n)(m-n)}{(2)(-1)\cancel{(7m-n)}\cancel{(5m+2n)}(m+n)}$

Take factor of -1

$= \dfrac{(3m-n)(m-n)}{-2(m+n)}$