Solutions to Multiplication/Division Quiz 2

1) $\frac{9x-36}{12x+9} \cdot \frac{24x+18}{4x^2-4x-48}$

Step (1) Apply Distributive Property

$$\frac{9(x-4)}{3(4x+3)} \cdot \frac{6(4x+3)}{4(x^2-1x-12)}$$

Step (2) Factor remaining quadratics

$$\frac{9(x-4)}{3(4x+3)} \cdot \frac{6(4x+3)}{4(x-4)(x+3)}$$

Step (3) Group monomials and binomials

$$\frac{9 \cdot 6}{3 \cdot 4} \cdot \frac{(x-4)(4x+3)}{(4x+3)(x-4)(x+3)} = \frac{54}{12} \cdot \frac{(x-4)(4x+3)}{(x-4)(4x+3)} \cdot \frac{1}{x+3}$$

Step (4) Simplify fractions

$$\frac{\cancel{54}^{9}}{\cancel{12}_{2}} \cdot 1 \cdot \frac{1}{x+3} = \boxed{\frac{9}{2(x+3)}}$$

Solutions X/÷ Rationals QUIZ ②

② $\dfrac{6x-4}{15x+45} \div \dfrac{6x^2+2x-4}{9x^2-30x+9}$

Step ① Rewrite Division as Multiplication

$$\frac{6x-4}{15x+45} \cdot \frac{9x^2-30x+9}{6x^2+2x-4}$$

Step ② Use Distributive Property

$$\frac{2(3x-2)}{15(x+3)} \cdot \frac{3(3x^2-10x+3)}{2(3x^2+1x-2)}$$

Step ③ Factor remaining quadratics

$$\frac{2(3x-2)}{15(x+3)} \cdot \frac{3(3x-1)(x-3)}{2(3x-2)(x+1)}$$

Step ④ Group monomials and binomials

$$\frac{2\cdot 3}{15\cdot 2} \cdot \frac{(3x-2)(3x-1)(x-3)}{(x+3)(3x-2)(x+1)} = \frac{6}{30} \cdot \frac{(3x-2)}{(3x-2)} \cdot \frac{(x-3)(3x-1)}{(x+3)(x+1)}$$

Step ⑤ simplify fractions

$$\frac{\cancel{6}^{1}}{\cancel{30}_{5}} \cdot \frac{\cancel{(3x-2)}^{1}}{\cancel{(3x-2)}^{1}} \cdot \frac{(x-3)(3x-1)}{(x+3)(x+1)} = \boxed{\frac{(x-3)(3x-1)}{5(x+3)(x+1)}}$$

Solutions X1÷ Rationals Quiz (2)

(3) $\dfrac{\dfrac{2x^2-7x+6}{x^2-8x+12}}{\dfrac{12x}{8x^2-46x-12}}$

Step (1) Rewrite vertical Division as Horizontal Division

$$\frac{2x^2-7x+6}{x^2-8x+12} \div \frac{12x}{8x^2-46x-12}$$

Step (2) Rewrite Division as multiplication

$$\frac{2x^2-7x+6}{x^2-8x+12} \cdot \frac{8x^2-46x-12}{12x}$$

Step (3) Apply Distributive Property

$$\frac{2x^2-7x+6}{x^2-8x+12} \cdot \frac{2(4x^2-23x-6)}{12x}$$

Step (4) factor Quadratics

$$\frac{(2x-3)(x-2)}{(x-6)(x-2)} \cdot \frac{2(4x+1)(x-6)}{12x}$$

Step (5) Group monomials and binomials

$$\frac{2}{12x} \cdot \frac{(2x-3)(x-2)(4x+1)(x-6)}{(x-6)(x-2)} = \frac{2}{12x} \cdot \frac{(x-2)(x-6)\cdot(2x-3)(4x+1)}{(x-2)(x-6)}$$

Solutions X / ÷ Rationals Quiz 2

(3 cont)

Step 6 Simplify fractions

$$\frac{1}{6x} \cdot \frac{(x-2)(x-6)}{(x+2)(x-6)} \cdot \frac{(2x-3)(4x+1)}{1}$$

$$= \boxed{\frac{(2x-3)(4x+1)}{6x}}$$

---

(4) $\dfrac{x^3+3x^2-18x}{3x^2+17x-6} \div \dfrac{3x^2-8x-3}{x^2+x-30} \cdot \dfrac{9x^2-1}{6x^3-2x^2}$

Step 1 Rewrite Division as Multiplication

$$\frac{x^3+3x^2-18x}{3x^2+17x-6} \cdot \frac{x^2+x-30}{3x^2-8x-3} \cdot \frac{9x^2-1}{6x^3-2x^2}$$

Step 2 Apply Distributive Property

$$\frac{x(x^2+3x-18)}{3x^2+17x-6} \cdot \frac{x^2+x-30}{3x^2-8x-3} \cdot \frac{9x^2-1}{2x^2(3x-1)}$$

Solutions X/÷ Rationals Quiz (2)

(4 cont) $\dfrac{x(x^2+3x-18)}{(3x^2+17x-6)} \cdot \dfrac{(x^2+x-30)}{(3x^2-8x-3)} \cdot \dfrac{(9x^2-1)}{2x^2(3x-1)}$

Step (3) ~~factor remaining quadratics~~

$$\frac{x(x+6)(x-3)}{(3x-1)(x+6)} \cdot \frac{(x+6)(x-5)}{(3x+1)(x-3)} \cdot \frac{(3x-1)(3x+1)}{2x^2(3x-1)}$$

Step (4) Group Monomials and Binomials

$$\frac{x}{2x^2} \cdot \frac{(x+6)(x-3)}{(x+6)(3x-1)} \cdot \frac{(x+6)(x-5)}{(3x+1)(x-3)} \cdot \frac{(3x-1)(3x+1)}{(3x-1)}$$

Step (5) Simplify, Factions

$$\frac{x}{2x^2} \cdot \frac{(x+6)(x-3)}{(x+6)(x-3)} \cdot \frac{(3x-1)(3x+1)}{(3x-1)(3x+1)} \cdot \frac{(x+6)(x-5)}{(3x-1)}$$

$$\frac{1}{2x} \cdot \frac{1 \cdot 1 \cdot (x+6)(x-5)}{(3x-1)} = \boxed{\frac{(x+6)(x-5)}{2x(3x-1)}}$$