

Simplify. SHOW ALL WORK! (3 pts each)

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

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

$$\frac{2x^2(x-6)}{4x^2} \rightarrow \frac{1(x-6)}{2x^2} \quad x \neq -1, 2$$

$$2) \frac{2x^2-2}{x^2-6x-7} (x^2-10x+21)$$

$$\frac{2(x^2-1)}{(x-7)(x+1)} = \frac{(x-7)(x-3)}{(x-7)(x+1)}$$

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

$$x \neq -1, -1$$

$$3) \frac{x-2}{x^2+7x-18} + \frac{x^2-6x^2-27x}{x^2+8x-9} \rightarrow \frac{x(x-2)}{(x+9)(x-2)} = \frac{(x+9)(x-1)}{x(x-9)(x+3)}$$

$$\frac{(x-1)}{x(x-9)(x+3)} \quad x \neq \pm 9, 0, -3$$

$$4) \frac{x^2-8x-20}{15x^2-150x} + \frac{x^2-9x}{x^2-7x-18}$$

$$\frac{(x-10)(x+2)}{15x^2(x-10)} = \frac{(x+9)(x+3)}{x(x-9)}$$

$$\frac{(x+2)^2}{15x^4} \quad x \neq 0, 9, -2, 10$$

$$5) \frac{x+3}{x+3} \cdot \frac{4}{x-1} \cdot \frac{2}{x+3} = \frac{x-1}{x-1}$$

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

$$\frac{2x+14}{(x+3)(x-1)} \text{ or } \frac{2(x+7)}{(x+3)(x-1)}$$

$$x \neq -3, 1$$

$$6) \frac{-4x+3}{x^2+3x-10} + \frac{2}{x+5}$$

$$\frac{-4x+3}{(x+5)(x-2)} + \frac{2(x-2)}{(x+5)(x-2)}$$

$$\frac{-4x+3}{(x+5)(x-2)} + \frac{2x-4}{(x+5)(x-2)}$$

$$\frac{-2x-1}{(x+5)(x-2)} \quad x \neq -5, 2$$

$$7) \frac{x}{x^2+6x+9} + \frac{3}{x^2-9} \cdot (x+3)$$

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

$$\frac{x^2-9x}{(x+3)(x+3)(x-3)} + \frac{3(x+3)}{(x+3)(x+3)(x-3)}$$

$$\frac{x^2+9}{(x+3)^2(x-3)} \quad x \neq \pm 3$$

$$8) \frac{-3x+4}{x-2} \cdot \frac{x-1}{x-3} = x-2$$

$$\frac{7x-21}{(x-3)(x-2)} + \frac{4x-8}{(x-3)(x-2)}$$

$$\frac{2}{x-3}$$

$$\frac{11x-29}{(x-3)(x-2)} \rightarrow \frac{11x-29}{2(x-2)} = \frac{(x-3)}{2}$$

$$\frac{11x-29}{2(x-2)} \quad x \neq 2, 3$$