

$$a) \frac{2x^2 - 12x}{15x} \cdot \frac{5x}{x-6}$$

$$\frac{\cancel{2x}(x-6)}{15\cancel{x}} \cdot \frac{5x}{\cancel{(x-6)}}$$

$$\frac{10x}{15} = \frac{2x}{3}, x \neq 0, 6$$

$$b) \frac{8x^2}{x-4} \div \frac{8x^2}{16x^4}$$

$$\frac{\cancel{8x^2}}{x-4} \cdot \frac{16x^4}{\cancel{8x^2}}$$

$$\frac{16x^4}{(x-4)}, x \neq 4, 0$$

$$c) \frac{x^3 + x^2}{16} \cdot \frac{20x - 10}{x^2 + x}$$

$$\frac{\cancel{x}x^2(\cancel{x+1})}{16} \cdot \frac{10(2x-1)}{\cancel{x}(\cancel{x+1})}$$

$$= \frac{10x(2x-1)}{16}$$

$$= \frac{5x(2x-1)}{8}, x \neq 0, -1$$

$$d) \frac{6x+24}{14x-4} \div \frac{8x+32}{14x-4}$$

$$\frac{6x+24}{\cancel{14x-4}} \cdot \frac{\cancel{14x-4}}{8x+32}$$

$$14x-4 \neq 0 \\ 14x \neq 4 \\ x \neq \frac{4}{14} = \frac{2}{7}$$

$$\frac{(6x+24)}{(8x+32)} = \frac{6(x+4)}{8(x+4)} = \frac{6}{8} = \frac{3}{4}$$

$$x \neq -4, \frac{2}{7}$$

$$e) \frac{12x^3}{3x^2+6x} \cdot \frac{4x^3+8x^2}{5}$$

$$\frac{12x^3}{3x(x+2)} \cdot \frac{4x^2(x+2)}{5}$$

$$\frac{48x^5}{15x} = \frac{16x^4}{5}, x \neq 0, -2$$

$$f) \frac{2x}{24x+4x^2} \div \frac{6x^2-6x}{9x^3+54x^2}$$

$$\frac{2x}{24x+4x^2} \cdot \frac{9x^3+54x^2}{6x^2-6x}$$

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

$$\frac{18x}{24(x-1)}$$

$$\frac{3x}{4(x-1)}, x \neq 0, -6, 1$$

$$\frac{(x+6)}{(6+x)} = 1$$

ex) $\frac{1+6}{6+1} = \frac{7}{7} = 1$

BUT

$$\frac{(x-6)}{(6-x)} = -1$$

ex) $\frac{1-6}{6-1} = \frac{-5}{5}$

$$g) \frac{4x^2 - 1}{x + 2} \cdot \frac{8x^2 - 32}{4x^2 + 2x}$$

$$\frac{(2x+1)(2x-1)}{x+2} \cdot \frac{8(x^2-4)}{2x(2x+1)}$$

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

$$\frac{4(2x-1)(x-2)}{x}, x \neq -2, 0, -\frac{1}{2}, 2$$