

2.6 Multiplying and Dividing Rational Expressions.

$$\frac{\overset{1}{\cancel{3}}}{\underset{2}{\cancel{4}}} \times \frac{\overset{5}{\cancel{10}}}{\underset{2}{\cancel{6}}} = \frac{5}{4}$$

$$\frac{3}{4} \div \frac{10}{6}$$

$$\frac{3}{\underset{2}{\cancel{4}}} \times \frac{\overset{3}{\cancel{6}}}{10} = \frac{9}{20}$$

$$1) \frac{5r+40}{10r-50} \cdot \frac{10r-50}{5r+15}$$

① Factor Fully

$$= \frac{\cancel{5}^{\text{blue}}(r+8)}{\cancel{10}^{\text{blue}}(r-5)^{\cancel{5}^{\text{red}}}} \times \frac{\cancel{10}^{\text{blue}}(r-5)^{\cancel{5}^{\text{red}}}}{\cancel{5}^{\text{blue}}(r+3)}$$

←

$$= \frac{r+8}{r+3}$$

$$r \neq -3, 5$$

$$2) \frac{x^2 - 8x + 12}{x^2 - 9x + 18} \cdot \frac{x^2 + x - 12}{10x^3 - 20x^2}$$

$$= \frac{\cancel{(x-2)} \cancel{(x-6)} (x+4) \cancel{(x-3)}}{\cancel{(x-6)} \cancel{(x-3)} 10x^2 \cancel{(x-2)}}$$

$$= \frac{x+4}{10x^2} \quad x \neq 0, 2, 3, 6$$

⊗ 120

⊕ 43

40, 3

$$3) \frac{7b^2 - 63b - 70}{15b^2 + 43b + 8} \cdot \frac{15b^2 + 43b + 8}{7b^2 + 49b + 42}$$

$$= \frac{7(b^2 - 9b - 10)}{15b^2 + 3b + 40b + 8} \times \frac{15b^2 + 3b + 40b + 8}{7(b^2 + 7b + 6)}$$

$$= \frac{7(b - 10)(b + 1)}{(3b + 8)(5b + 1)} \times \frac{(3b + 8)(5b + 1)}{7(b + 6)(b + 1)}$$

$$= \frac{b - 10}{b + 6}$$

$$b \neq -\frac{8}{3}, -\frac{1}{5}, -6, -1$$

$$4) \frac{x-4}{x^2+x-12} \div \frac{x-4}{x^2-5x+6}$$

Flip and factor.

$$= \frac{\cancel{x-4}}{(x+4)(\cancel{x-3})} \times \frac{(\cancel{x-2})(\cancel{x-3})}{\cancel{x-4}}$$

$$= \frac{x-2}{x+4}$$

$$x \neq -4, 2, 3, 4$$

$$5) \frac{4a^2 - 4a}{14a^2 + 4a} \div \frac{12a^3 - 12a^2}{28a^3 + 8a^2}$$

$$= \frac{\cancel{4}^2 a (a - 1)}{\cancel{2}^1 a (2a + 2)} \times \frac{\cancel{4}^1 \cancel{a}^2 (2a + 2)}{\cancel{12}^3 \cancel{a}^2 (a - 1)}$$

$$= \frac{2}{3} \quad a \neq -2, 0, 1$$

$$6) \frac{21k^2 + 18k}{49k + 42} \div \frac{15k^2 + 6k}{5k^2 - 23k - 10}$$

$-25k + 2k$

$$\textcircled{x} - 50$$

$$\textcircled{+} - 23$$

$$-25, 2$$

$$= \frac{\cancel{3k} (7k + 6)}{7(\cancel{7k + 6})} \times \frac{(\cancel{5k + 2})(k - 5)}{\cancel{3k}(\cancel{5k + 2})}$$

$$= \frac{k - 5}{7} \quad k \neq \frac{-6}{7}, \frac{-2}{5}, 0, 5$$