

# Rational Expressions

## Operations with Polynomials - Notes

Simplify each and state the excluded values. Show your work.

$$1) \frac{4^2}{2n^2 - 2n - 4} + \frac{4}{3} \quad \text{LCD: } 3(n+1)(n-2)$$

$$2(n^2 - 1n - 2)$$

$$2(n+1)(n-2)$$

$$\frac{3(2) + 4(n^2 - 1n - 2)}{3(n+1)(n-2)}$$

$$3(2) + 4(n^2 - 1n - 2)$$

$$6 + 4n^2 - 4n - 8$$

LCD

$$\frac{4n^2 - 4n - 2}{3(n+1)(n-2)}; n \neq -1, 2$$

$$2) \frac{v+1}{v-6} - \frac{4v}{v+5} \quad \text{LCD: } (v-6)(v+5)$$

$$\frac{(v+1)(v+5) - 4v(v-6)}{(v-6)(v+5)}$$

$$(v+1)(v+5) - 4v(v-6)$$

$$\frac{v^2 + 6v + 5 - 4v^2 + 24v}{\text{LCD}}$$

$$\frac{-3v^2 + 30v + 5}{(v-6)(v+5)}; v \neq 6, -5$$

Simplify each and state the excluded values. Show your work.

$$3) \frac{m^2 + 4m + 3}{5m^3 + 5m^2} \cdot \frac{5m^3 - 10m^2}{m^2 + 4m - 12}$$

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

$$\frac{m+3}{m+6}; m \neq 0, -1, 2, -6$$

$$4) \frac{7r^3 - 7r^2}{3r + 18} \cdot \frac{3r - 3}{r^2 - 2r + 1}$$

$$\frac{7r^2(r-1) \cdot 3(r-1)}{3(r+6) \cdot (r-1)(r-1)}$$

$$\frac{7r^2}{r+6}; r \neq -6, 1$$

$$5) \frac{-k^2 + 18k - 80}{6k - 24} \div \frac{k^2 - 18k + 80}{k - 6}$$

$$\frac{-1(k-8)(k-10) \cdot (k-6)}{6(k-4) \cdot (k-8)(k-10)}$$

$$\frac{-k+6}{6(k-4)}; k \neq 4, 8, 10, 6$$

$$6) \frac{2x^2 + 12x}{x+1} \div \frac{2x^2 - 20x}{4x^3 + 4x^2}$$

$$\frac{2x(x+6) \cdot 4x^2(x+1)}{(x+1) \cdot 2x(x-10)}$$

$$\frac{4x^3 + 24x^2}{x-10}; x \neq -1, 0, 10$$