

Simplifying Rational Expressions

Date _____

Monomials: Simplify and state the restrictions.

$$1) \frac{35r^2}{10r} = \frac{7r}{2}, \{r \neq 0\}$$

$$2) \frac{24a}{32a^2} = \frac{3}{4a}, \{a \neq 0\}$$

$$3) \frac{12x^5}{30x^2} \rightarrow \frac{5(7r^2)}{5(2r)}$$

$$4) \frac{40x^5}{12x^2}$$

$$5) \frac{16n}{72n^4}$$

$$6) \frac{18n}{54n^2}$$

Factor, simplify, then state the restrictions (from the factored form)

$$7) \frac{v^2 - 19v + 90}{2v^2 - 18v}$$

$$= \frac{(v-9)(v-10)}{2v(v-9)} \quad \{v \neq 0, 9\}$$

$$= \frac{v-10}{2v}$$

$$9) \frac{x^2 - 11x + 10}{x^2 - 12x + 20}$$

$$8) \frac{10x - 90}{x^2 - 81}$$

$$= \frac{10(x-9)}{(x+9)(x-9)} \quad \{x \neq -9, 9\}$$

$$= \frac{10}{x+9}$$

$$10) \frac{30x + 12}{12x - 42}$$

$$11) \frac{n^2 + 2n - 15}{n^2 - 13n + 30}$$

$$12) \frac{7n - 35}{6n^3 - 30n^2}$$

$$= 3n(n^2 + 4n - 5) \begin{matrix} \textcircled{D} -5 \\ \textcircled{C} 4 \end{matrix}$$

$$13) \frac{3n^3 + 12n^2 - 15n}{n^2 + 11n + 30} \begin{matrix} \textcircled{D} 30 \\ \textcircled{C} 11 \end{matrix}$$

$$= \frac{3n(n-1)(\cancel{n+5})}{(n+6)(\cancel{n+5})}$$

$$= \frac{3n(n-1)}{(n+6)} \quad \{n \neq -6, -5\}$$

$$15) \frac{a^2 - 10a + 21}{6a^3 - 30a^2 + 36a}$$

$$17) \frac{k^3 + k^2 - 2k}{k^2 - 5k - 14}$$

$$14) \frac{40x - 80}{56x^2 + 24x - 80}$$

$$= \frac{40(x-2)}{8(7x^2 + 3x - 10)} \begin{matrix} \textcircled{D} -70 \\ \textcircled{C} +3 \end{matrix} +10, -7$$

$$= \frac{40(x-2)}{8(\underbrace{7x^2}_{7x} - \underbrace{7x}_{10} + \underbrace{10x}_{10} - 10)}$$

$$= \frac{40(x-2)}{8(7x+10)(x-1)} = \frac{5(x-2)}{(7x+10)(x-1)}$$

$$\{x \neq -\frac{10}{7}, 1\}$$

$$16) \frac{3x^2 - 3x - 36}{x^3 + 6x^2 + 9x}$$

$$18) \frac{n^2 - 8n - 20}{3n^2 + 21n + 30}$$

$$\begin{aligned} 7x+10 &= 0 \\ 7x &= -10 \\ x &= -\frac{10}{7} \end{aligned}$$