

Rational Expressions

State the **excluded values** for each. *1-6 all*

$$1) \frac{60x^3}{12x} = \frac{\overset{5}{\cancel{60}} \cdot \overset{3}{\cancel{x^3}} x^2}{\underset{1}{\cancel{12}} \cdot \underset{1}{\cancel{x}}} = 5x^2$$

$\{0\}$ ← *written as* $x \neq 0$

$$2) \frac{70v^2}{100v} = \frac{7v}{10}$$

$\{0\}$

$$3) \frac{m+7}{m^2+4m-21} = \frac{1}{(m-3)}$$

$\{-7, 3\}$

$$4) \frac{n^2+6n+5}{n+1} = n+5$$

$\{-1\}$

$$5) \frac{35x-35}{25x-40} = \frac{7(x-1)}{5x-8}$$

$\left\{ \frac{8}{5} \right\}$

$$6) \frac{-n^2+16n-63}{n^2-2n-35} = \frac{n-9}{n+5}$$

$\{-5, 7\}$

Simplify each and state the excluded values. *8-26 even*

$$7) \frac{p+4}{p^2+6p+8}$$

$\frac{1}{p+2}; \{-2, -4\}$

$$8) \frac{9}{15a-15} = \frac{\overset{3}{\cancel{9}}}{\underset{3}{\cancel{15}}(a-1)} = \frac{3}{5(a-1)}$$

$\frac{3}{5(a-1)}$ $a \neq 1$

$\frac{3}{5(a-1)}; \{1\}$

$$9) \frac{2a^2+10a}{3a^2+15a}$$

$\frac{2}{3}; \{0, -5\}$

$$10) \frac{p^2-3p-10}{p^2+p-2}$$

$\frac{p-5}{p-1}; \{-2, 1\}$

$$11) \frac{x^2+x-6}{x^2+8x+15}$$

$\frac{x-2}{x+5}; \{-3, -5\}$

$$12) \frac{a^2+5a+4}{a^2+9a+20}$$

$\frac{a+1}{a+5}; \{-4, -5\}$

$$13) \frac{x^2 - 2x - 15}{x^2 - 6x + 5}$$

$$\frac{x+3}{x-1}; \{1, 5\}$$

$$14) \frac{10x-6}{10x-6}$$

$$1; \left\{\frac{3}{5}\right\}$$

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$$15) \frac{(v-7)(v+8)}{(v+8)(v-10)} \div \frac{1}{v-10} \frac{\cancel{(v-7)}\cancel{(v+8)} \cancel{(v-10)}}{\cancel{(v+8)}\cancel{(v-10)} 1} \frac{n+3}{n+2} \div \frac{(n-1)(n+3)}{(n-1)^2}$$

$$v-7; \{-8, 10\} \quad = v-7 \quad \frac{n-1}{n+2}; \{-2, 1, -3\}$$

$v \neq -8 \quad v \neq 10$

$$17) \frac{x+3}{4} \cdot \frac{3(x-6)}{3(x+3)} = \frac{\cancel{(x+3)} 3(x-6)}{4 \cancel{(x+3)} 3}$$

$$\frac{x-6}{4}; \{-3\} \quad = \frac{x+6}{4}$$

$x \neq -3$

$$18) \frac{x-8}{(x+6)(x-8)} \cdot \frac{4x(x+10)}{x+10}$$

$$\frac{4x}{x+6}; \{-6, 8, -10\}$$

$$19) \frac{2b^2 - 12b}{b+5} \div \frac{b-6}{b+5}$$

$$2b; \{-5, 6\}$$

$$20) \frac{1}{n+9} \div \frac{6-n}{3n-18}$$

$$-\frac{3}{n+9}; \{-9, 6\}$$

$$21) \frac{28-7b}{b-4} \cdot \frac{1}{b+10}$$

$$-\frac{7}{b+10}; \{4, -10\}$$

$$22) \frac{2}{v^2 - 12v + 27} \cdot \frac{v^2 - 12v + 27}{3}$$

$$\frac{2}{3}; \{3, 9\}$$

$$23) \frac{1}{5p^2} \div \frac{9p-36}{5p^3-35p^2}$$

$$\frac{p-7}{9(p-4)}; \{0, 7, 4\}$$

$$24) \frac{8-7x-x^2}{x+8} \cdot \frac{x+5}{9x-9}$$

$$-\frac{(x+5)}{9}; \{-8, 1\}$$

$$25) \frac{x^2-16}{9-x} \cdot \frac{x^2+x-90}{x^2+14x+40}$$

$$-(x-4); \{9, -4, -10\}$$

$$26) \frac{10x^2-20x}{40x^3-80x^2} \cdot \frac{16x^3+80x^2}{6x+30}$$

$$\frac{2x}{3}; \{0, 2, -5\}$$