

## Rational Expressions

State the excluded values for each.

1)  $\frac{60x^3}{12x}$

2)  $\frac{70v^2}{100v}$

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

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

5)  $\frac{35x-35}{25x-40}$

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

Simplify each and state the excluded values.

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

8)  $\frac{9}{15a-15}$

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

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

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

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

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

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

15) 
$$\frac{(v - 7)(v + 8)}{(v + 8)(v - 10)} \div \frac{1}{v - 10}$$

16) 
$$\frac{n + 3}{n + 2} \div \frac{(n - 1)(n + 3)}{(n - 1)^2}$$

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

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

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

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

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

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

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

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

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

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

## Rational Expressions

State the excluded values for each.

$$1) \frac{60x^3}{12x}$$

$$\{0\}$$

$$2) \frac{70v^2}{100v}$$

$$\{0\}$$

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

$$\{-7, 3\}$$

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

$$\{-1\}$$

$$5) \frac{35x-35}{25x-40}$$

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

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

$$\{-5, 7\}$$

Simplify each and state the excluded values.

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

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

$$8) \frac{9}{15a-15}$$

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

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

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

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

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

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

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

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

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

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

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

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

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

15)  $\frac{(v-7)(v+8)}{(v+8)(v-10)} \div \frac{1}{v-10}$

$v-7; \{-8, 10\}$

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

$\frac{n-1}{n+2}; \{-2, 1, -3\}$

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

$\frac{x-6}{4}; \{-3\}$

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

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