

Rational Expressions Part 2

Simplify each expression.

1)  $\frac{6k^3}{9} \cdot \frac{7}{4k} = \frac{42k^3}{36k} = \boxed{\frac{7k^2}{6}}$  ev:  $\{0\}$

2)  $\frac{9n^2}{1} \cdot \frac{10n}{5n} = \frac{90n^3}{5n} = \boxed{18n^2}$  ev:  $\{0\}$

3)  $\frac{(2x+7)(x+4)(5x-3)}{(5x-3)(x-2)(2x+7)} = \boxed{\frac{x+4}{x-2}}$   
ev:  $\{-7/2, 3/5, 2\}$

4)  $\frac{4(k-9)}{8k} \cdot \frac{16k(k+5)}{12k(k+5)} = \boxed{\frac{2(k-9)}{3k}}$   
ev:  $\{-5, 0\}$

5)  $\frac{70n^2 + 50n}{10n} \cdot \frac{6n^2}{7n+5}$   
 $\frac{10n(7n+5)}{10n} \cdot \frac{6n^2}{(7n+5)} = \boxed{6n^2}$   
ev:  $\{-5/7, 0\}$

6)  $\frac{7n-1}{7n^2-29n+4} \cdot \frac{5n^2}{1}$   
 $\frac{(7n-1)}{7n^2-28n-n+4} \cdot \frac{5n^2}{1} = \frac{(7n-1) \cdot 5n^2}{7n(n-4)-1(n-4)}$   
 $= \frac{(7n-1)}{(7n-1)(n-4)} \cdot \frac{5n^2}{1} = \boxed{\frac{5n^2}{n-4}}$  ev:  $\{1/7, 4\}$

7)  $\frac{5b^2 + 42b - 80}{4 - 5b} \cdot \frac{25b^3 - 20b^2}{40b^2 - 64b}$   
 $\frac{5b^2 + 50b - 8b - 80}{-(5b-4)} \cdot \frac{5b^2(5b-4)}{8b(5b-8)}$   
 $= \frac{(b+10)(5b-8)}{-(5b-4)} \cdot \frac{5b^2(5b-4)}{8b(5b-8)} = \boxed{\frac{-5b(b+10)}{8}}$   
ev:  $\{0, 4/5, 8/5\}$

8)  $\frac{27x^2 - 72x}{12x^2 - 18x} \cdot \frac{3 - 2x}{3x^2 + 10x - 48}$   
 $\frac{9x(3x-8)}{6x(2x-3)} \cdot \frac{-(2x-3)}{3x^2-8x+18x-48} = \frac{9x(3x-8)}{6x(2x-3)} \cdot \frac{-(2x-3)}{(3x-8)(x+6)}$   
 $= \frac{-3}{2(x+6)}$  ev:  $\{-6, 0, 3/2, 8/3\}$

9)  $\frac{9b}{27b^2 - 18b} \cdot \frac{27b^2 - 18b}{80b^2}$   
 $\frac{9b}{9b(3b-2)} \cdot \frac{9b(3b-2)}{80b^2} = \boxed{\frac{9}{80b}}$   
ev:  $\{0, 2/3\}$

10)  $\frac{21n^2 - 32n - 5}{7n^2 - 55n - 8} \cdot \frac{45n^2 - 9n}{15n^2 - 28n + 5}$   
 $\frac{21n^2 + 3n - 35n - 5}{7n^2 - 56n + 1n - 8} \cdot \frac{9n(5n-1)}{15n^2 - 25n - 3n + 5}$   
 $= \frac{(3n-5)(7n+1)}{(7n+1)(n-8)} \cdot \frac{9n(5n-1)}{(5n-1)(3n-5)} = \boxed{\frac{9n}{n-8}}$   
ev:  $\{-1/7, 1/5, 3/8\}$

$$11) \frac{4y}{1} \div \frac{7}{10} = \frac{4y}{1} \cdot \frac{10}{7} = \boxed{\frac{40y}{7}}$$

$$\text{ev: } \{\emptyset\}$$

$$12) \frac{8n}{3} \div \frac{5n^2}{9n} = \frac{8\cancel{n}}{3} \cdot \frac{9\cancel{n}}{5n^2} = \boxed{\frac{24}{5}}$$

$$\text{ev: } \{0\}$$

$$13) \frac{5(n+1)}{7n+5} \div \frac{30n^2(n+1)}{(n-9)(7n+5)}$$

$$\frac{5\cancel{(n+1)}}{(7n+5)} \cdot \frac{(7n+5)\cancel{(n-9)}}{30n^2\cancel{(n+1)}} = \boxed{\frac{n-9}{6n^2}}$$

$$\text{ev: } \{-1, -5/7, 0\}$$

$$14) \frac{10n(n-9)}{10n} \div \frac{4n^2(5n-8)}{5n-8}$$

$$\frac{10\cancel{n}(n-9)}{10\cancel{n}} \cdot \frac{(5n-8)}{4n^2(5n-8)} = \boxed{\frac{n-9}{4n^2}}$$

$$\text{ev: } \{0, 8/5\}$$

$$15) \frac{(m+7)}{1} \div \frac{3m^2+6m-24}{6-3m}$$

$$\frac{(m+7)}{1} \cdot \frac{-3(m-2)}{3(m^2+2m-8)} = \frac{(m+7)}{1} \cdot \frac{-3(m-2)}{3(m+4)(m-2)}$$

$$= \boxed{\frac{-(m+7)}{m+4}} \text{ ev: } \{-4, 2\}$$

$$16) \frac{9}{2p+8} \div \frac{9p+18}{2p+8}$$

$$\frac{9}{2(p+4)} \cdot \frac{2(p+4)}{9(p+2)} = \boxed{\frac{1}{p+2}}$$

$$\text{ev: } \{-4, -2\}$$

$$17) \frac{70x+70}{35x^2-14x-49} \div \frac{1}{40x^3-56x^2}$$

$$\frac{70(x+1)}{7(5x^2-2x-7)} \cdot \frac{8x^2(5x-7)}{1} = \frac{70(x+1)}{7(x+1)(5x-7)} \cdot \frac{8x^2(5x-7)}{1}$$

$$\boxed{80x^2} \text{ ev: } \{-1, 7/5, 0\}$$

$$18) \frac{18-18k}{8k-16} \div \frac{9k-9}{6k-12}$$

$$\frac{-18(k-1)}{8(k-2)} \cdot \frac{6(k-2)}{9(k-1)} = \boxed{\frac{-3}{2}}$$

$$\text{ev: } \{1, 2\}$$

$$19) \frac{45}{72+3n-9n^2} \div \frac{n+10}{9n^2-3n-72}$$

$$\frac{45}{(x-3)(3x+8)} \cdot \frac{2(3n^2-n-24)}{n+10} = \boxed{\frac{-45}{n+10}}$$

$$\text{ev: } \{-10, -8/3, 3\}$$

$$20) \frac{3n^2-18n-21}{30+21n-9n^2} \div \frac{n^2+5n-24}{3n-10} \cdot \frac{-30}{-10 \cdot 3}$$

$$\frac{3(n^2-6n-7)}{-3(3n^2-7n-10)} \cdot \frac{(3n-10)}{(n+8)(n-3)} =$$

$$\frac{3(n-7)(n+1)}{-3(n+1)(3n-10)} \cdot \frac{(3n-10)}{(n+8)(n-3)} = \boxed{\frac{-(n-7)}{(n+8)(n-3)}}$$

$$\text{ev: } \{-8, -1, 10/3, 3\}$$

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3)  $\frac{2x+7}{5x-3} \cdot \frac{(x+4)(5x-3)}{(x-2)(2x+7)}$

4)  $\frac{4(k-9)}{8k} \cdot \frac{16k(k+5)}{12k(k+5)}$

5)  $\frac{70n^2+50n}{10n} \cdot \frac{6n^2}{7n+5}$

6)  $\frac{7n-1}{7n^2-29n+4} \cdot 5n^2$

7)  $\frac{5b^2+42b-80}{4-5b} \cdot \frac{25b^3-20b^2}{40b^2-64b}$

8)  $\frac{27x^2-72x}{12x^2-18x} \cdot \frac{3-2x}{3x^2+10x-48}$

9)  $\frac{9b}{27b^2-18b} \cdot \frac{27b^2-18b}{80b^2}$

10)  $\frac{21n^2-32n-5}{7n^2-55n-8} \cdot \frac{45n^2-9n}{15n^2-28n+5}$

$$11) 4v \div \frac{7}{10}$$

$$12) \frac{8n}{3} \div \frac{5n^2}{9n}$$

$$13) \frac{5(n+1)}{7n+5} \div \frac{30n^2(n+1)}{(n-9)(7n+5)}$$

$$14) \frac{10n(n-9)}{10n} \div \frac{4n^2(5n-8)}{5n-8}$$

$$15) (m+7) \div \frac{3m^2+6m-24}{6-3m}$$

$$16) \frac{9}{2p+8} \div \frac{9p+18}{2p+8}$$

$$17) \frac{70x+70}{35x^2-14x-49} \div \frac{1}{40x^3-56x^2}$$

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