

4B.4 - All Operations

Simplify each and state the excluded values.

1)  $\frac{2b^2 - 11b + 12}{b - 4}$   $b-4 \neq 0$   $b \neq 4$   
 $\frac{(2b-3)(b-4)}{b-4} = 2b-3, b \neq 4$

2)  $\frac{5x^2 - 17x - 12}{x - 4} = 5x + 3, x \neq 4$

3)  $\frac{p-3}{2p^2 - 12p + 18}$   $p-3 \neq 0$   $p \neq 3$   
 $\frac{p-3}{2(p^2 - 6p + 9)} = \frac{p-3}{2(p-3)(p-3)} = \frac{1}{2(p-3)}$   
 Suppose to set both they are the  $\neq 0$  but same  $p \neq 3$

4)  $\frac{14n^2 + 12n}{20n} = \frac{7n+6}{10}, n \neq 0$

Simplify each expression.

5)  $\frac{1}{4n^3 + 4n^2} \cdot \frac{n^2 + 7n + 10}{n + 5}$   
 $\frac{1}{4n^2(n+1)} \cdot \frac{(n+2)(n+5)}{n+5} = \frac{n+2}{4n^2(n+1)}$

6)  $\frac{p^2 - 14p + 49}{28p} \cdot \frac{1}{p-7} = \frac{p-7}{28p}$

7)  $\frac{6n^3 + 42n^2}{n+7} \cdot \frac{1}{n-8}$   
 $\frac{6n^2(n+7)}{n+7} \cdot \frac{1}{n-8} = \frac{6n^2}{n-8}$

8)  $\frac{2x+8}{8x} \cdot \frac{1}{x+4} = \frac{1}{4x}$

9)  $\frac{b-4}{b^2 + 2b - 24} \cdot \frac{9b}{5b^3 + 30b^2}$   
 $\frac{b-4}{(b-4)(b+6)} \cdot \frac{5b^2(b+6)}{9b} = \frac{5b^{2-1}}{9b} = \frac{5b}{9}$

10)  $\frac{k-9}{k-5} \div \frac{k-8}{k^2 - 13k + 40} = k-9$

11)  $\frac{8m^2 + 48m}{8m} \div \frac{m+6}{3}$   
 $\frac{8m(m+6)}{8m} \cdot \frac{3}{m+6} = 3$

12)  $\frac{6x-54}{7x^2} \div \frac{3}{7x^2} = 2(x-9)$

13)  $\frac{x+4}{x^2 + 8x + 16} + \frac{2}{x^2 + 8x + 16}$   
 $\frac{x+4+2}{x^2 + 8x + 16} = \frac{x+6}{x^2 + 8x + 16}$

14)  $\frac{2}{2x} + \frac{5}{2x-4} = \frac{7x-4}{2x(x-2)}$

$$\frac{\overset{(15)}{(v-6)}^3}{\overset{(15)}{(v-6)}^5} + \frac{4(5)}{v-6(5)}$$

$$\frac{3v-18+4(5)}{5(v-6)} = \frac{3v-18+20}{5(v-6)} = \frac{3v+2}{5(v-6)}$$

$$16) \frac{6}{a-4} + \frac{3}{6} = \frac{a+8}{2(a-4)}$$

$$17) \frac{n+2}{n^2-3n-10} - \frac{3}{n^2-3n-10}$$

$$\frac{n+2-3}{n^2-3n-10} = \frac{n-1}{n^2-3n-10}$$

$$18) \frac{3}{2} - \frac{4}{3x+18} = \frac{9x+46}{6(x+6)}$$

$$\frac{\overset{(19)}{(2x-6)}^6}{\overset{(19)}{(2x-6)}^3} - \frac{5x(3)}{2x-6(3)}$$

$$\frac{6(2x-6)-5x(3)}{3(2x-6)} = \frac{12x-36-15x}{3(2x-6)} = \frac{-3x-36}{3(2x-6)}$$

$$\frac{-3(x+12)}{3(2x-6)} = \frac{-x-12}{2x-6}$$

$$20) \frac{6}{3n} - \frac{n-2}{n-4} = \frac{-n^2+4n-8}{n(n-4)}$$

$$21) \frac{\frac{x}{16}}{\frac{x-3}{16}}$$

$$22) \frac{\frac{3}{x^2}}{\frac{x^2}{25}} = \frac{75}{x^4}$$

$$\frac{x}{16} \cdot \frac{16}{x-3} = \frac{x}{x-3}$$

$$23) \frac{9}{\overset{(25)}{5} \cdot \overset{(9)}{x}} - \frac{\overset{(9)}{x}}{\overset{(25)}{25} \cdot \overset{(9)}{9}}$$

$$\frac{9}{125-9x} = 9 \cdot \frac{225}{125-9x} = \frac{2025}{125-9x}$$

$$24) \frac{\frac{1}{4} + \frac{4}{m}}{\frac{16}{m^2}} = \frac{x(x+16)}{64}$$

$$\frac{\overset{(25)}{(6x+6)}^6}{\overset{(25)}{(6x+6)}^3} - \frac{4(3)}{6x+6(3)}$$

$$\frac{6(6x+6)-4(3)}{3(6x+6)} = \frac{36x+36-12}{3[6(x+1)]} = \frac{36x+24}{18(x+1)}$$

$$26) \frac{x^2-2x-3}{2} \cdot \frac{1}{x-3} = \frac{x+1}{2}$$

$$\frac{12(3x+2)}{18(x+1)} = \frac{2(3x+2)}{3(x+1)}$$

$$27) \frac{4n^3-20n^2}{n-5} \div \frac{1}{9n^2}$$

$$\frac{4n^2(n-5)}{n-5} \cdot \frac{9n^2}{1} = 36n^4$$

$$28) \frac{6}{2n-6} + \frac{3}{2} = \frac{3(2x-3)}{2}$$