Advanced Algebra

Name_____

6.1 & 6.2 Test Review

Date_____

Simplify each. List the undefined values of x.

1) $\frac{k^2 - 8k - 20}{k^2 + 12k + 20}$ $\frac{(k-10)(k+2)}{(k+10)(k+2)}$

$\frac{k-10}{k+10}$ $k \neq -10, -2$

2) $\frac{28n^2 - 28n}{8n^2 + 32n} = \frac{28n(n-1)}{8n(n+4)} = \frac{7(n-1)}{2(n+4)}$

$n \neq 0, -4$

3) $\frac{m^2 - 3m + 2}{m^2 + 4m - 12} = \frac{(m-2)(m-1)}{(m+6)(m-2)}$

$= \frac{m-1}{m+6}$

4) $\frac{3x^4 - 12x^3 + 12x^2}{10x^2 - 30x + 20} = \frac{3x^2(x^2 - 4x + 4)}{10(x^2 - 3x + 2)}$

$= \frac{3x^2(x-2)(x-2)}{10(x-2)(x-1)}$

$= \frac{3x^2(x-2)}{10(x-1)}$ $x \neq 2, 1$

5) $\frac{3n^2 - n - 24}{9n^2 - 36n + 27}$ -72, -9, 8, -1

$9(n^2 - 4n + 3)$ $3n^2 - 9n + 8n - 24$

$9(n-3)(n-1)$ $3n(n-3) 8(n-3)$

$(3n+8)(n-3)$

$\frac{(3n+8)(n-3)}{9(n-3)(n-1)} = \frac{3n+8}{9(n-1)}$

$n \neq 3, 1$

6) $\frac{2p^2 + 8p - 64}{10p^2 + 100p + 160}$ $2(p^2 + 4p - 32)$

$10(p^2 + 10p + 16)$ $\frac{2(p+8)(p-4)}{(p+8)(p+2)}$

$\frac{2(p-4)}{p+2}$

$p \neq -8, -2$

Multiply or Divide each expression.

7) $\frac{p-8}{5p^2} \cdot \frac{15p^3+10p^2}{9p+6}$ $5p^2(3p+2)$ $3(3p+2)$ $= \boxed{\frac{p-8}{3}}$

8) $\frac{1}{7x+2} \cdot \frac{28x^3+8x^2}{x+4}$ $4x^2(7x+2)$ $= \boxed{\frac{4x^2}{x+4}}$

9) $\frac{-x^2+6x-8}{x^2-6x+8} \div \frac{x^2-16}{x^2-8x+16}$

$\frac{-(x^2-6x+8)}{x^2-6x+8} \cdot \frac{(x-4)(x-4)}{x^2-8x+16}$ $(x+4)(x-4)$

$\boxed{\frac{-(x-4)}{x+4}}$

10) $\frac{7x^2-42x}{x^2-12x+36} \div \frac{10x^2+60x}{10x^2-60x}$

$\frac{7x(x-6)}{7x^2-42x}$ $\frac{x^2-12x+36}{(x-6)(x-6)}$ $\cdot \frac{10x(x-6)}{10x^2-60x}$ $\frac{10x^2+60x}{10x(x+6)}$

$\boxed{\frac{7x}{x+6}}$

11) $\frac{2}{2x-20} \cdot \frac{-x^2+2x-1}{10x^2-10x}$

$\frac{2}{2(x-10)} \cdot \frac{-(x-1)(x-1)}{10x(x-1)}$ $-(x^2-2x+1)$

$\boxed{\frac{-(x-1)}{10x(x-10)}}$

12) $\frac{4k+32}{9k+90} \cdot \frac{k+5}{4k+20}$ $4(k+8)$ $9(k+10)$ $4(k+5)$

$\boxed{\frac{k+8}{9(k+10)}}$

13) $\frac{x^2+5x-36}{-x^2+5x-4} \cdot \frac{x^2-10x+9}{8x+72}$ $(x+9)(x-4)$ $-(x^2-5x+4)$ $(x-9)(x-1)$ $8(x+9)$ $= \boxed{\frac{x-9}{-8}}$

$-(x-9)(x-1)$

VARIATION WORD PROBLEMS – 6.1 & 6.2 TEST Review

14) On the planet Neptune, an object falls 18 feet in 2 seconds. If the distance an object falls varies inversely with the square of the time since it was in motion, how long does it take for the same object to fall 79 feet?

$D = \frac{k}{t^2}$ $\quad 18 = \frac{k}{4}$ $\quad k = 72$ $\quad D = \frac{72}{t^2}$ $\quad 79 = \frac{72}{t^2}$

$79t^2 = 72$

$t^2 = .91$

$t = .95$ sec.

15) The amount of money a magazine pays for an article varies directly as the number of words in the article. If it costs $720 for a 1200 word article, determine the amount of money paid for a 2700 word article.

$M = kW$

$720 = k(1200)$

$k = .6$

$m = .6W$

$m = .6(2700)$

$= \$1620$

16) Mattel found that the number of limited edition Barbie Dolls sold, *N*, varies directly with their advertising budget , *A*, and inversely with the price of each doll, *P*. When $54,000 was spent on advertising and the price of the doll is $90, then 9,600 units are sold. Determine the number of dolls sold if the price of the doll remains the same, but the advertising budget is increased to $144,000.

$N = \frac{kA}{P}$

$9600 = \frac{k(54{,}000)}{90}$

$864{,}000 = k(54000)$

$k = 16$

$N = \frac{16A}{P}$

$N = \frac{16(144000)}{90}$

$= 25{,}600$ dolls

17) The temperature, *T* (in degrees Kelvin), of an enclosed gas varies jointly with the volume, *V* (in cubic centimeters), and the pressure, *P* (in kilograms per square centimeter). The temperature of a gas is 294°K when the volume is 8000 cubic centimeters and the pressure is 0.75 kilogram per square centimeter. What is the temperature when the volume is 7000 cubic centimeters and the pressure is 0.87 kilogram per square centimeter?

$T = kVP$

$294 = k(8000)(.75)$

$294 = k(6000)$

$k = .049$

$T = .049VP$

$T = .049(7000)(.87)$

$= 298.41$ K