Math 8 Unit 1 worksheet: Monomials and the exponent rules

Name _____ Date _____ Period _____

1. Multiply. Write each answer as a single monomial.

(a) $(6p^2)(-5p^7)$ (b) $(-4w)(-7w^5)$ (c) $(-3r^2s)(2rs^4)$ (d) $(0.5k^3)(8k^4)$

(e) $(4ab^2)(-a^3c)$ (f) $(-12gh^2)\left(\frac{5}{6}g^3\right)$ (g) $\left(\frac{3}{5}m^4\right)\left(\frac{10}{9}m^2n\right)$ (h) $(-x^2)(-3xy)(-2y^5)$

2. Divide. Every variable is nonzero. Write each answer with positive exponents and the coefficient in lowest terms.

(a) $\frac{56k^{10}}{-8k^2}$ (b) $\frac{14r^3s^6}{21r^3s^2}$ (c) $\frac{-30a^2b^5}{-12a^6b}$ (d) $\frac{20m^4n}{50mn^3p^2}$

3. Simplify. Every variable is nonzero. Work out each power of a product in parentheses first.

(a) $(-2a^2b)^3(3ab^4)$ (b) $(5m^3)(-m^2n)^2$ (c) $\frac{(6x^3y)^2}{9x^4y^5}$ (d) $\frac{(-3p^2)^3}{(3p)^2}$

4. Simplify. Every variable is nonzero. Write each answer with positive exponents only.

(a) $(5x^{-2}y)(3x^6y^{-4})$ (b) $\frac{-9u^{-4}v}{12u^{-1}w^{-2}}$ (c) $(3m^{-2})^{-2}\cdot m^{-3}$ (d) $\frac{(2x^3)^{-1}}{x^{-5}y^0}$

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5. Hannah's bedroom floor is a rectangle $4x$ feet by $5x$ feet. A closet in one corner, $2x$ feet by x feet, is part of that rectangle and does not get new flooring.

(a) Write the area that gets new flooring as a monomial.

(b) Find that area when $x = 3$.

6. For each pair of monomials P and Q, find the product PQ and the quotient $\dfrac{P}{Q}$, simplified. Then say whether each result is a monomial. Every variable is nonzero.

(a) $P = 12x^5y^2,\ Q = 4x^2y$

(b) $P = 6a^3,\ Q = 9a^3b$

(c) $P = -10m^2n^4,\ Q = -5m^2$

7. A rectangular banner is $4x^2$ centimeters long and $3xy$ centimeters wide, where x and y are positive.

(a) Write the area of the banner as a monomial.

(b) A second banner is designed by putting $3x$ in place of x and $\dfrac{y}{2}$ in place of y in both lengths. Write its length, its width and its area as monomials.

(c) How many times the area of the first banner is the area of the second? Does the answer depend on x and y?

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