

Name _____



Directions. Read the algebraic expression and answer the questions that follow in the box on the right.

$4x - 2y + 3$	
1. What are the <u>three terms</u> in this expression?	$4x, -2y, 3$
2. What are the variable terms?	x, y
3. What is the constant term?	3
$5x^2 + x + 7$	
4. What is the variable in this expression?	x
5. What is the 5 in the term $5x^2$ called?	Coefficient
6. What is the 2 in the term $5x^2$ called?	exponent
$x^3 - xy + y^2 - 9$	
7. How could y^2 be rewritten?	$y \cdot y$
8. What does the term xy mean?	x times y
9. Can you combine all the Xs and Ys in this expression?	No

$$x \cdot x =$$

The sum of twice a number and 7

A. $2(x + 7)$

B. $2x + 7$

C. $2(x - 7)$

D. $2x - 7$

Twice the sum of a number and five.

A. $2(x + 5)$

B. $2x + 5$

C. $2(x - 5)$

D. $2x - 5$

Five less than three-fourths of a number.

A. $5 - \frac{3}{4}x$

B. $\frac{3}{4}(5 - x)$

C. $\frac{3}{4}(x - 5)$

D. $\frac{3}{4}x - 5$

The square of a number decreased by six.

A. $6 - 2x$

B. $6 - x^2$

C. $2x - 6$

D. $x^2 - 6$

Exponent Rules Review Worksheet

NOTE: Anything to the zero power equals 1!

Product Rule: When multiplying monomials that have the same base, add the exponents.

$$x^m \cdot x^n = x^{m+n}$$

Example 1: $x^1 \cdot x^3 \cdot x^4 = x^{1+3+4} = x^8$ Example 2: $(2x^2y)(-3x^3y^4) = 2 \cdot (-3) \cdot x^2 \cdot x^3 \cdot y \cdot y^4 = -6x^5y^5$

Power Rule: When raising monomials to powers, multiply the exponents.

$$(x^m)^n = x^{m \cdot n}$$

Example 3: $(x^2y^3)^4 = x^{2 \cdot 4} y^{3 \cdot 4} = x^8y^{12}$

Example 4: $(2x^3yz^2)^3 = 2^3 x^{3 \cdot 3} y^3 z^{2 \cdot 3} = 8x^9y^3z^6$

Quotient Rule: When dividing monomials that have the same base, subtract the exponents.

$$\frac{x^m}{x^n} = x^{m-n}$$

Example 5: $\frac{x^3}{x^{-2}} = x^{3-(-2)} = x^5$

Example 6: $\frac{5^6}{5^2} = 5^{6-2} = 5^4$

Example 7: $\frac{36m^3n^5}{-9mn^4} = \frac{36}{-9} \cdot \frac{m^3}{m} \cdot \frac{n^5}{n^4} = -4m^2n$

Simplify each of the following. Copy the problem. Work on your own paper.

1) $a \cdot a^2 \cdot a^3$
 a^6

2) $(2a^2b)(4ab^2)$
 $8a^3b^3$

3) $(6x^2)(-3x^5)$
 $-18x^7$

4) $b^3 \cdot b^4 \cdot b^7 \cdot b^1$
 b^{15}

5) $(3x^3)(3x^4)(-3x^2)$
 $-27x^9$

6) $(2x^2y^3)^2$
 $4x^4y^6$

7) $(5x^2y^4)^3$
 $125x^6y^{12}$

8) $(6x^4y^6)^3$
 $216x^{12}y^{18}$

9) $(4x^3y^3)^3$
 $64x^9y^9$

10) $(7xy)^2$
 $49x^2y^2$

11) $\frac{x^3}{x}$
 x^2

12) $\frac{18c^3}{-3c^2}$
 $-6c$

13) $\frac{9a^3b^5}{-3ab^2}$
 $-3a^2b^3$

14) $\frac{-48c^2d^4}{-8cd}$
 $6cd^3$

15) $\frac{22y^6z^8}{2yz^{-7}}$
 $11y^5z^{15}$

16) $x^2 \cdot x^7$
 x^9

17) $(x^2)^7$
 x^{14}

18) $(-2x^4)^5$
 $-32x^{20}$

19) $2x^3 + 7x^3$
 $9x^3$

20) 7^0
 1

21) $8x^0$
 8

22) -3^4
 -81

23) $(-3)^4$
 81

24) $6x^0y^8 - (2y^2)^4$
 $6y^8 - 16y^8 = -10y^8$

25) $(x+2y)(x-2y)$
 skip

26) $\frac{2x^3}{-8x^4}$
 $\frac{1}{-4x}$ or $\frac{1}{-4}x^{-1}$

27) $\frac{xy^7}{x^3y^4}$
 $\frac{y^3}{x^2}$ or y^3x^{-2}

28) $6x^5 \cdot 3x^5 \cdot x^0$
 $18x^{10}$

29) $(3st^2)^3$
 $27s^3t^6$

30) $\left(\frac{3m^2n^7}{m}\right)^5$
 $243m^9n^{35}$

Warm-up

1. $7x + 12 + 4x^2$

Descending degree order

a. Write the polynomial in standard form.

$$4x^2 + 7x + 12$$

b. What is the leading coefficient of the polynomial? 4

c. What is the degree of the polynomial? 2

d. What is the classification by degree of the polynomial? 2nd

e. What is the special name of this polynomial (3 terms)? trinomial

Add or subtract the polynomials:

2. $(2x - 5) + (x + 4)$
 $2x - 5 + x + 4 = 3x - 1$

3. $(2x - 5) - (x + 4)$
 $2x - 5 - x - 4 = x - 9$

4. $(2x^3 + 4x^2 - 5x + 5) - (3x + 6x^3 - 1)$
 $2x^3 + 4x^2 - 5x + 5 - 3x - 6x^3 + 1 = -4x^3 + 4x^2 - 8x + 6$

Multiply

5. $3(x + 2)$
 $3x + 6$

6. $4x^3(x^3 + 8)$
 $4x^3 \cdot x^3 + 4x^3 \cdot 8 = 4x^6 + 32x^3$

7. $3x(x^3 + 5x + 6)$
 $3x \cdot x^3 + 3x \cdot 5x + 3x \cdot 6 = 3x^4 + 15x^2 + 18x$

8. $(2x - 3)(x - 7)$

$$(3mn^7)^5$$

$$\frac{m^2}{m^3} = \frac{m \cdot m}{m \cdot m \cdot m}$$