

1. Evaluate each expression.

a. -3^2 -9

d. $(\frac{1}{2})^4$ $\frac{1}{16}$

g. $-2x^0$ $-2(1) = -2$

b. $(-3)^2$ 9

e. $-2 \cdot 5^3$
 $-2 \cdot 125 = -250$

h. $-3^0 + 4^0$
 $-1 + 1 = 0$

c. $(-4)^3$
 -64

f. 7^0
 1

2. Evaluate given the replacement values for the variables.

a. $x^2, x = -2$
 $(-2)^2 = 4$

c. $2xy^2, x = 3, y = 5$
 $2(3)(5)^2 = 6 \cdot 25 = 150$

b. $-4x^2y^3, x = 2, y = -1$
 $-4(2)^2(-1)^3 = 4 \cdot 4 = 16$

d. $\frac{2z^4}{5}, z = -2$
 $\frac{2(-2)^4}{5} = \frac{32}{5}$

3. Simplify.

a. $x^2 \cdot x^5$
 x^7

g. $(-5)^7(-5)^6$
 $(-5)^{13}$

m. $(5y^4)(3y)$
 $15y^5$

b. $(a^2b)(a^{13}b^{17})$
 $a^{15}b^{18}$

h. $(-8mn^6)(9m^2n^2)$
 $-72m^3n^8$

n. $(12x^5)(-x^6)(x^4)$
 $-12x^{15}$

c. $(x^9)^4$
 x^{36}

i. $(ab)^6$
 a^6b^6

o. $(a^4b)^7$
 $a^{28}b^7$

d. $(-7a^2b^5c)^2$
 $49a^4b^{10}c^2$

j. $(\frac{r}{s})^9$
 $\frac{r^9}{s^9}$

p. $(\frac{xy}{7})^2$
 $\frac{x^2y^2}{49}$

e. $(-\frac{2xz}{y^5})^2$
 $\frac{4x^2z^2}{y^{10}}$

k. $(\frac{xy^4}{-3z^3})^3$
 $\frac{x^3y^{12}}{-27z^9}$

q. $\frac{x^3}{x}$
 x^2

$$f. \frac{(-6)^{13}}{(-6)^{11}}$$

$$(-6)^2 = 36$$

$$l. \frac{7x^2y^6}{14x^2y^3}$$

$$\frac{y^3}{2}$$

$$r. \frac{9a^4b^7}{27ab^2}$$

$$\frac{a^3b^5}{3}$$

4. Simplify each expression.

$$a. (5^0)^3 + (y^0)^7$$

$$(1)^3 + (1)^7 = 1 + 1 = 2$$

$$d. \frac{(2a^5b^3)^4}{-16a^{20}b^7} = \frac{16a^{20}b^{12}}{-16a^{20}b^7} = -b^5$$

$$b. \frac{(2x^6y^2)^5}{-32x^{20}y^{10}} = \frac{32x^{30}y^{10}}{-32x^{20}y^{10}} = -x^{10}$$

$$e. x^{5a} \cdot x^{4a} = x^{9a}$$

$$c. (a^b)^5 = a^{5b}$$

$$f. \frac{x^{9a}}{x^{4a}} = x^{5a}$$

5. Suppose you borrow money for six months. If the interest rate is compounded monthly, the formula $A = P \left(1 + \frac{r}{12}\right)^6$ gives the total amount to be repaid at the end of six months. For a loan of $P = \$1000$ and interest rate of 9% ($r = 0.09$), how much money is needed to pay off the loan?

$$A = 1000 \left(1 + \frac{0.09}{12}\right)^6 = \$1045.85$$

6. Combine like terms.

$$a. 14x^2 + 9x^2$$

$$23x^2$$

$$f. 8s - 5s + 4s$$

$$7s$$

$$b. \frac{2}{5}x^2 - \frac{1}{3}x^3 + x^2 - \frac{1}{4}x^3 + 6$$

$$\left(-\frac{1}{3} - \frac{1}{4}\right)x^3 + \left(\frac{2}{5} + 1\right)x^2 + 6$$

$$-\frac{4}{12} - \frac{3}{12} \quad \frac{2}{5} + \frac{5}{5}$$

$$-\frac{7}{12}x^3 + \frac{7}{5}x^2 + 6$$

$$g. x^2y + xy - y + 10x^2y - 2y + xy$$

$$11x^2y + 2xy - 3y$$

$$c. (-7x + 5) + (-3x^2 + 7x + 5)$$

$$-3x^2 + 10$$

$$h. (2x^2 + 5) - (3x^2 - 9)$$

$$2x^2 + 5 - 3x^2 + 9$$

$$-x^2 + 14$$

$$d. (2x^2 + 3x - 9) - (-4x + 7)$$

$$2x^2 + 3x - 9 + 4x - 7$$

$$2x^2 + 7x - 16$$

$$i. (-6y^2 + 3y - 4) - (9y^2 - 3y)$$

$$-6y^2 + 3y - 4 - 9y^2 + 3y$$

$$-15y^2 + 6y - 4$$

$$e. (3x^2y - 6xy + x^2y^2 - 5) - (11x^2y^2 - 1 + 5x^2y)$$

$$3x^2y - 6xy + x^2y^2 - 5 - 11x^2y^2 + 1 - 5x^2y$$

$$-10x^2y^2 - 2x^2y - 6xy - 4$$

7. For each of the expressions, label them as monomial, binomial, trinomial or none of these.

a. $x + 2$

binomial

c. $a + 5a^2 + 3a^3 - 4a^4$

none of these

b. $7r^2s^2 + 2rs - 3rs^5$

trinomial

d. x^2y^3

monomial

8. For each expression, state the degree of the term.

a. x^2

2

b. y^5

5

c. xy

2

d. $x^3y^7z^6$

16

9. For each expression, state the degree of the polynomial.

a. $9m^3 - 5m^2 + 4m - 8$

3

c. $12x^4y - x^2y^2 - 12x^2y^4$

6

b. $5y + 2$

1

d. $9y - x^2 + 5xyz$

3

10. Explain why xyz is a monomial, but $x + y + z$ is a trinomial.

$x + y + z$ is made up of 3 terms

but xyz is one term