

(4 points each) Simplify. Assume that no denominator is equal to zero.

1) $3y^5 \cdot y^3$

$3y^8$

2) $\left(\frac{4}{3}\right)^{-4}$

$\frac{4^{-4}}{3^{-4}} = \frac{3^4}{4^4} = \frac{81}{256}$

3) $(9m^3n^5)(-2mn^2)$

$-18m^4n^7$

4) $(w^5y^4)^3$

$w^{15}y^{12}$

5) $\left(\frac{2x^3y^2z}{3x^4yz^{-2}}\right)^{-2}$

$\frac{2^{-2}x^{-6}y^{-4}z^{-2}}{3^{-2}x^{-8}y^{-2}z^4} = \frac{3^2x^8y^2}{2^2x^6y^4z^2z^4}$

$\frac{9x^2y^{-2}}{4z^6} = \frac{9x^2}{4y^2z^6}$

6) $4a^3n^6 + 4(a^3n)^6 + 4(an^2)^3$

$4a^3n^6 + 4a^{18}n^6 + 4a^3n^6$
 $8a^3n^6 + 4a^{18}n^6$

7) $\frac{p^6q^2}{p^3q}$

$p^3q^1 = p^3q$

8) $\frac{16r^3s^{-5}}{4r^{-1}s^2}$

$\frac{4r^3r^1}{s^2s^5} = \frac{4r^4}{s^7}$

9) $\frac{(-8x^2y^2)^2}{(4x^3y)^3}$

$\frac{(-8)^2x^4y^4}{4^3x^9y^3} = \frac{64x^4y^4}{64x^9y^3} = y^1x^{-5} = \frac{y}{x^5}$

(2 points) Express the number in scientific notation.

10) 0.000498

4.98×10^{-4}

(2 points) Express the number in standard notation.

11) 1.27×10^5

$127,000$

(3 points) Evaluate. Express your answer in scientific notation.

12) $(2.5 \times 10^{-2})(4 \times 10^6)$

$10 \times 10^4 = 1 \times 10^5$

13) $\frac{2.74 \times 10^{10}}{2.51 \times 10^8}$

1.09×10^2

(2 points each) Find the degree of the polynomial.

14) $2x^3y^3 + 4xy - 10x^3y$

6

15) $a^3b^2c + 2a^5c + b^3c^2$

6

(2 points) Arrange the terms of the polynomial so that the powers of x are in descending order.

16) $4 + 3x^3y^3 - x^5y + xy$

$-x^5y + 3x^3y^3 + xy + 4$

(2 points) Arrange the terms of the polynomial so that the powers of x are in ascending order.

17) $7ax - 12 + 3ax^3 + a^2x^2$

$-12 + 7ax + a^2x^2 + 3ax^3$

(3 points each) Find each sum or difference.

18) $(5n^2 - 2ny + 3y^2) - (9n^2 - 8ny - 10y^2)$

$5n^2 - 2ny + 3y^2 - 9n^2 + 8ny + 10y^2$

$-4n^2 + 6ny + 13y^2$

19) $(11m^2 - 2mn + 8n^2) + (8m^2 - 2n^2 + 4mn)$

$19m^2 + 2mn + 6n^2$

20) $(x^2 + 5y) - (2x^2 + 6y)$

$x^2 + 5y - 2x^2 - 6y$

$-x^2 - y$

(4 points each) Find each product.

$$21) 5hk^2(2h^2k - hk^3 + 4h^2k^2)$$

$$10h^3k^3 - 5h^2k^5 + 20h^3k^4$$

$$22) (4x^2 + 2y^2)(2x^2 - y^2)$$

$$8x^4 - 4x^2y^2 + 4x^2y^2 - 2y^4$$

$$8x^4 - 2y^4$$

$$23) \left(\frac{1}{4}x + 2\right)\left(\frac{1}{4}x - 2\right)$$

$$\frac{1}{16}x^2 - \frac{2}{4}x + \frac{2}{4}x - 4$$

$$\frac{1}{16}x^2 - 4$$

$$24) (3s + 5)(2s^2 - 8s + 6)$$

$$6s^3 - 24s^2 + 18s + 10s^2 - 40s + 30$$

$$6s^3 - 14s^2 - 22s + 30$$

$$25) (5c - 4)^2$$

$$(5c - 4)(5c - 4)$$

$$25c^2 - 20c - 20c + 16$$

$$25c^2 - 40c + 16$$

$$26) (7a - 3b)(7a + 3b)$$

$$49a^2 + 21ab - 21ab - 9b^2$$

$$49a^2 - 9b^2$$

$$27) (4n + 1)^2$$

$$(4n + 1)(4n + 1)$$

$$16n^2 + 4n + 4n + 1$$

$$16n^2 + 8n + 1$$

$$28) (2x^2 - 2x - 3)(2x^2 - 4x + 3)$$

$$4x^4 - 8x^3 + 6x^2 - 4x^3 + 8x^2 - 6x - 6x^2 + 12x - 9$$

$$4x^4 - 12x^3 + 8x^2 + 6x - 9$$

(5 points each) Solve each equation.

$$29) -6(3n - 2) = 4(-3 - 2n)$$

$$-18n + 12 = -12 - 8n$$

$$+8n \qquad \qquad \qquad +8n$$

$$-10n + 12 = -12$$

$$\qquad -12 \quad -12$$

$$\underline{-10n = -24}$$

$$\underline{-10 \quad -10}$$

$$n = \frac{12}{5}$$

$$30) w(w + 6) + 4w = -7 + w(w + 9)$$

$$w^2 + 6w + 4w = -7 + w^2 + 9w$$

$$-w^2 \qquad \qquad \qquad -w^2$$

$$10w = -7 + 9w$$

$$-9w \qquad \qquad -9w$$

$$w = -7$$

$$31) 8n + 11 = 4 + 5(2n - 1)$$

$$8n + 11 = 4 + 10n - 5$$

$$-10n \qquad \qquad -10n$$

$$-2n + 11 = 4 - 5$$

$$-2n + 11 = -1$$

$$\qquad -11 \quad -11$$

$$\underline{-2n = -12}$$

$$\underline{-2 \quad -2}$$

$$n = 6$$

(6 points each) Complete.

32) In a guinea pig, pure black hair coloring B is dominant over pure white coloring b . Suppose two hybrid Bb guinea pigs, with black hair coloring are bred.

B	b
B BB	Bb
b Bb	bb

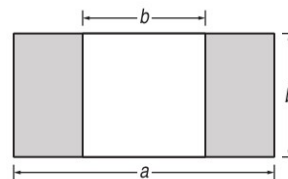
a. Find an expression for the genetic make-up of the guinea pig offspring.

$$.25BB + .5Bb + .25bb$$

b. What is the probability that two hybrid guinea pigs with black hair coloring will produce a guinea pig with white hair coloring?

$$25\%$$

33) Write an expression to represent the area of the shaded region.



$$A = a \cdot b - b \cdot b$$

$$A = ab - b^2$$