

Third Set of Homework for Math 05

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Please note: You should fully justify your answers.

1 Evaluation of algebraic expressions

1. Evaluate each of the following expressions

A. $(a + b)^2$ B. $a^2 + b^2$ C. $a^2 + 2ab + b^2$

for the following values of the variables:

(a) $a = 1, b = 4$

(b) $a = 0, b = -2$

(c) $a = 5, b = -3$

(d) $a = 2, b = -2$

(e) $a = -3, b = -2$

(f) $a = \frac{1}{2}, b = -2$

(g) $a = -\frac{1}{3}, b = -\frac{1}{2}$

2. Evaluate each of the following expressions for $a = 2, b = -4, c = 3,$ and $d = -5$:

(a) $2a - 3b - c + 10d$

(b) $a^2 + b^2$

(c) $-a^2 + 3b$

(d) $2b(a^2 - 2d)$

(e) $a^2 - b^2$

(f) $a^3 + b^3$

(g) $4 - 3c + 2c^2$

(h) $-2a^2 + 6a - 4$

(i) $dc^2 - 4ab$

(j) $\frac{2a - b}{-d + c}$

(k) $\frac{a^2 - 3b}{-d^2 + 3c}$

(l) $(a + b)(a - b)$

(m) $(c + d)(c^2 - cd + d^2)$

3. Do the given values of the variables make the following statements **true** or **false**?

(a) $2x + 3y = -2; \quad x = 5, y = -4$

(b) $-y^2 + y = -2y; \quad y = 3$

(c) $|2x - y| = -2; \quad x = -3, y = -4$

(d) $x^2 + y^2 < 16; \quad x = 3, y = -3$

(e) $\frac{2x}{y^2} = -3xy; \quad x = 0, y = 4$

4. In the formula

$$P = \frac{I}{rt}$$

P stands for the principal, I for the total interest earned, r for the rate of interest, and t for the time, in years, that the money was invested. Find the principal if the total interest earned in 3 years at a rate of 4% is \$720.

5. The area A of a triangle with base b and height h is given by the formula

$$A = \frac{1}{2}bh$$

Find the area of a triangle with base 5 in and height 4 in.

6. The volume of a sphere of radius r is given by the formula

$$V = \frac{4}{3}\pi r^3$$

where π is the area of a circle of radius 1 (this is a number *approximately* equal to 3.14159265358979). Find the volume of a sphere of radius 3 cm.