

1. Perform the operations as indicated.

$$(a) \sqrt{(-1)^4 - 6(2^2 - (-3)^2) - (-1)^3 + 10 \div 5 \cdot 2} = 6$$

$$(b) \frac{-3^2 - (-3)^2 - 16 \div (-2) \cdot (-2) + (-2)^2}{|(-4)(-7) - (-2)|} = -1$$

$$(c) \frac{(-1)^2 - \left(-\frac{1}{2}\right)^2}{5\frac{5}{8}} + \frac{1}{5} = \frac{1}{3}$$

$$(d) \frac{2}{3} - \frac{3}{5} \left(-\frac{1}{3}\right)^2 = \frac{3}{5}$$

$$(e) ||2 - 3^3| - 4^2| = 9$$

$$(f) -|-5| = -5$$

2. Simplify each of the following.

$$(a) (2x^5)(x^4) = 2x^9$$

$$(b) (2x^5)^4 = 16x^{20}$$

$$(c) (-xy)^2(-xy^2)^3 = -x^5y^8$$

$$(d) \frac{(2ab)^3(-3a^2b)^2}{-b(6ab^2)^2} = -2a^5$$

3. Evaluate $15 - |-x - x^2 + 5|$ if

$$(a) x = 0 \quad 10$$

$$(b) x = 2 \quad 14$$

$$(c) x = -2 \quad 12$$

$$(d) x = \frac{1}{2} \quad \frac{43}{4}$$

4. Evaluate $\frac{3ab + 2a^2 - 2b^2}{a + 2b}$ if

$$(a) a = 2 \text{ and } b = -3 \quad 7$$

$$(b) a = -1 \text{ and } b = -2 \quad 0$$

$$(c) a = -6 \text{ and } b = 3. \quad \text{undefined}$$

$$(d) a = -\frac{1}{2} \text{ and } b = \frac{3}{4} \quad -\frac{7}{4}$$

5. Consider the equation $-x^2 + 2x^3 + 3 = -4x(x - 2)$. For each of the numbers given, determine whether it is a solution of the equation or not.

(a) $x = -2$ $-17 \neq -32 \implies$ no

(b) $x = -\frac{1}{2}$ $\frac{5}{2} \neq -5 \implies$ no

(c) $x = \frac{1}{2}$ $3 = 3 \implies$ yes

(d) $x = -3$ $-60 = -60 \implies$ yes

6. Solve each of the following equations. Make sure to check your solutions.

(a) $\frac{2x - 7}{3} = -1$ 2

(b) $\frac{x + 8}{3} = -2$ -14

(c) $\frac{x}{3} + 8 = -2$ -30

(d) $\frac{1}{5}x - \frac{2}{3} = \frac{26}{15}$ 12

(e) $\frac{3}{8}x + \left(1\frac{4}{5}\right) = \frac{3}{10}$ -4

7. Word Problems.

(a) A TV is priced at \$ 600. How much would it cost if it went on a 15% sale? $\$ 510$

(b) We have placed \$ 5000 in a bank account with an annual interest rate of 6%. How much money do we have in the account after one year? $\$ 5300$

(c) Ann took four exams. Her scores on the first three exams were 63, 76, and 68. How many points did she earn on the fourth exam if her average is 71? 77

(d) If we multiply a number by -2 and add 7, the result is 25. Find this number. -9

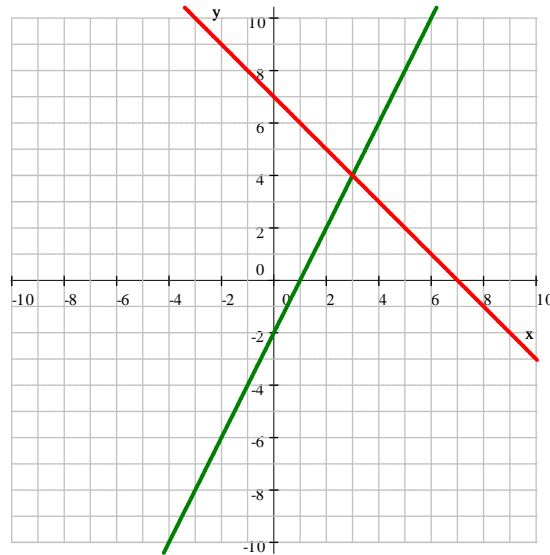
(e) If we subtract 5 from the opposite of a number, we get -1 . Find this number. -4

(f) Three times a number is 5 more than 16. Find this number. 7

(g) The product of 3 and the opposite of a number is -63 . Find this number. 21

8. Consider the equations $2x - y = 2$ and $y = -x + 7$.

- (a) Graph these lines in the same coordinate system. Use your graph to find the coordinates where the points intersect. $(3, 4)$



- (b) Use algebraic methods to check your answer for part a).

Solution: Is the point $(3, 4)$ on the line $2x - y = 2$?

$$\text{LHS} = 2x - y = 2(3) - (4) = 6 - 4 = 2 = \text{RHS} \implies \text{yes}$$

Is the point $(3, 4)$ on the line $y = -x + 7$?

$$\text{LHS} = y = 4$$

$$\text{RHS} = -x + 7 = -3 + 7 = 4 = \text{LHS} \implies \text{yes}$$