S 1.6 Algebraic Expressions

1. Translate the sentence into an algebraic expression.

(a) six more than double a number

(b) the sum of three consecutive odd integers (if the smallest one is n)

(c) the average of five consecutive positive integers (if the smallest one is n)

(d) A number is two less than one half of the another number.

2. Simplify the expression.

(a) $2(3x-5)-6(4+x)$ (b) $6(5x+4)-3(2-x)$

(c) $(8x^2-19x+18)-(3x^2-8x+30)$ (d) $-6(2ab-a^2)-\left[-4(5ab+6a^2)\right]$

3. Write as an algebraic expression.

(a) five more than the absolute value of a number

(b) the absolute value of the sum of two numbers

(c) the sum of the absolute value of two numbers

(d) The absolute value of the sum of two numbers is less than the square of their sum.

4. (a) The operation $b*a$ is defined as follows: $b*a = \dfrac{2a-b}{b-3a}$. Evaluate $3*5$.

(b) The operation $\boxed{x}$ indicates that one should subtract 2 from x and then multiply the result by 2.

The operation $\langle x \rangle$ indicates that one should multiply x by 2 and then subtract 2 from the product.

Find the value of $\boxed{x}-\langle x \rangle$.

5. (a) Evaluate the following expression if the value of x is 5, y is -1.25, $z = -2.5$, and $w = -\dfrac{1}{2}$.

$-\left[-x + y - (z - w) \right]$

(b) Simplify. Then evaluate the expression $(-x^2 + 5 + 4x) + (5x - 4 + 2x^2)$ when $x = -2$.

6. Suppose n^* means $\dfrac{1}{n}$, the reciprocal of n. For example, $5^* = \dfrac{1}{5}$. How many of the following statements are true?

i) $3^* + 6^* = 9^*$ ii) $6^* - 4^* = 2^*$ iii) $2^* \cdot 6^* = 12^*$ iv) $10^* \div 2^* = 5^*$

Homework

1. (a) Express $\dfrac{a}{2} + \dfrac{6a - 5}{3}$ as a single fraction.   (b)) Express $\dfrac{5y + 3}{12} - \dfrac{4 - 2y}{9}$ as a single fraction.

2. (a) If the operation $x \odot y$ is defined as $2y - x^2$, evaluate $(-2 \odot 3) \odot (-3)$.

     (b) If $a * b = \left(\dfrac{1}{a}\right)^b + \left(\dfrac{1}{b}\right)^a$, find $2 * 3$.

3. Simplify.

(a) $4(2 - 3a) - \dfrac{1}{2}(4 + 24a)$ (b) $\dfrac{24x}{21} + \dfrac{35x}{49} - \dfrac{x}{2}$

4. Simplify. Then evaluate the expression $2x^2 - 5x + x^2 + 4x - 3x^2 - 2$ when $x = \dfrac{1}{2}$.

5. Given a 2-digit number, a new 3-digit number is made from it by putting the digit 1 after it. The new number is then

A. the old number plus one

B. ten times the old number, plus one

C. one hundred plus the old number

D. one hundred times the old number, plus one