

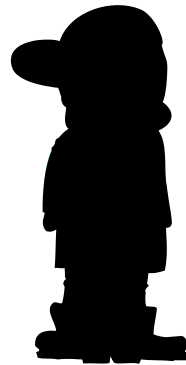
Chapter 3: The Language of Algebra

<u>Symbol</u>	<u>Key Words</u>	<u>English & Algebra Translations</u>
+	sum, add, increase, more than, plus, increased by, greater, exceeded by, and	f increased by 10 the sum of x and 9
-	difference, subtract, take away, minus, decrease, fewer, less, less than, decreased by, diminished by	4 less than y 32 fewer CDs than Allan's
X	multiply, of, product, times	the product of 4 and t One-half of the pumpkin weighs 3 pounds
÷	divide, quotient, into, for, per, divided by	500 divided into 4 parts A 24 inch board cut into 8 pieces

<u>Symbol</u>	<u>Key Words</u>	<u>English & Algebra Translations</u>
=	equals, is equivalent to, is the result of, is	twice a number plus 4 is 14
>	is greater than, is more, has more	x is greater than 5
<	is less than, is fewer, has fewer	Pauline and Fred together have fewer books than Vicki
\geq	is greater than or equal to, is at least, has at least	The movie was at least 4 hours long
\leq	is less than or equal to, is at most, has at most	The car is at most 1.5 miles away
\neq	is not equal to, is not the same as, cannot equal, does not equal	Today is not the 3rd of the month

Points to Remember:

- 1). Before you translate a problem situation into an algebraic expression, be sure you understand what the situation means.
- 2) Define each variable you create with and equals sign.
- 3) At times a chart of some sort can help you understand things.



Practice:

1. If x = Luke's age and $x + 6$ = Nancy's age in years, write an equation for each of the following statements:

a) The sum of Luke's and Nancy's ages is less than 30 years.

b) Three times Luke's age equals twice Nancy's age.

c) The difference between Nancy's age in 10 years and twice Luke's present age is 4 years.

2) When 8 is subtracted from 3 times a number, the result is 19. Which of the following equations represents this statement?

a) $8 - 3x = 19$

b) $3x - 8 = 19$

c) $3(x - 8) = 19$

d) $3(8 - x) = 19$

3) Jonas has 20 coins, all nickels and dimes, that have a total value of \$1.25.

If n represents the number of nickels, which algebraic equation represents this situation?

a) $20n = 125$

b) $5n = 1.25$

c) $5n + 10(20 - n) = 125$

d) $5n + 10n - 20 = 125$

1. A suit costs \$125. Represent the cost in terms of suits.
2. Represent the cost of a foot of lumber that sells for cents a foot.
3. The sum of two numbers is s . If one number is represented by x , represent the other number in terms of x .
4. If Ann weighed 45 kilograms, represent her weight after she has lost kilograms.
5. If a plane travels 550 kilometers per hour, represent the distance it will travel in t hours.
6. The number of kilometers traveled by a bus is represented by b . A train traveled 175 kilometers farther than the bus. Represent the number of kilometers traveled by the train.
7. The width of a rectangle is w centimeters. Represent the length of the rectangle if it exceeds twice the width by l centimeters.
8. Represent the number of days in w weeks.

1. The total cost of x shirts bought at a cost of $(x+5)$ dollars each
2. Thirteen less than twice a number is -5
3. Twice Bobby's age is the same as his Uncle's age
4. When 8 is subtracted from 3 times a number, the result is 19
5. A number is greater than twice the number decreased by 10
6. The square root of half a number is equal to $\frac{1}{5}$ the number
7. A number squared, increased by 8, is the same as the square of 3 more than the number
8. In 15 years, Ann's age will be 6 years greater than twice her current age
9. Frank's weight is 16 pounds more than three times his son's weight, w
10. The sum of 10 and the product of 5 and a number is 55

Evaluating Algebraic Expressions.

no
equal sign

Evaluate means
SOLVE!

Method:

- ① Substitute the given values for the variables.
- ② Simplify by using the order of operations

Evaluate: $a - b(a - x)^2$
if $a = -1$, $b = -2$, $x = 3$

$$\begin{aligned} &= -1 - (-2)(-1 - 3)^2 \\ &= -1 + 2(-4)^2 \\ &= -1 + 2(16) \\ &= -1 + 32 \\ &= 31 \end{aligned}$$

If d is an odd integer, and e is an even integer, which of the following is an even integer?

$$\checkmark 2d + e = 2(1) + 2 = 4 \quad d = 1$$

$$\checkmark 2d + 2e = 2(1) + 2(2) = 6 \quad e = 2$$

$$\times de + d = 1(2) + 1 = 3$$

$$\checkmark 3e + 3d + 1 = 3(2) + 3(1) + 1 = 10$$

Which of these values will make the algebraic fraction undefined?

$$\text{undefined} = \frac{0}{0} \quad \frac{2x+3}{2x-3} \quad 2x-3$$

$$x=2 \quad \checkmark \quad \frac{4}{3} - \frac{2}{3} = \frac{2}{3}$$

$$x=3 \quad \checkmark$$

$$x=\frac{2}{3}$$

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① $a - (b - c)$ $a = -3$ $b = 4$ $c = -5$

$$-3 - (4 - (-5))$$

$$-3 - (9) = -12$$

③ If $x + 3$ is an even integer, which of the following is not even?

$$x + 3$$



must be something odd!!!

~~① $2x + 2 = 2(1) + 2 = 4$~~

② $2x + 3 = 2(1) + 3 = 5$

⑤ If e is an even integer and d is an odd integer, which of the following is an even integer?

$$2d^2 + 3e = 2(1)^2 + 3(2) \quad \begin{matrix} d=1 \\ e=2 \end{matrix}$$

~~$de + d^2$~~

~~$3e^2 + d$~~

~~$d^2 + 3e$~~

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

⑦ If $m = -3$, then what does $-2m^3$ equal?

$$-2(-3)^3$$

$$-2(-3)(-3)(-3) = 54$$