Understanding Variables and Constants

LEVEL 1: The Basics

Q1: For each expression, identify the variable, the coefficient, and the constant.

	Variable(s)	Coefficient(s)	Constant(s)
$x + 7$			
$7a - 2b + 3$			
$5 - y$			
$x^2 + 2y$			
$2a$			
$\dfrac{2}{5}x - 10$			
$\dfrac{b}{6}$			
12			
$3z - 1 + 2z$			
$-4x - 6$			

Q2: Write an algebraic expression for each phrase.

1) 5 more than a number x

2) A number y decreased by 3

3) The product of 7 and a number a

4) A number b divided by 4

5) Twice a number m

6) 10 less than a number p

7) The sum of a number q and 6

8) The quotient of 12 and a number r

9) Three times a number s, plus 8

10) A number t divided by 5, minus 2

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LEVEL 2: Dive Deeper

Q1: Write an algebraic expression for each word problem.

a) The cost of x apples at 0.75 each and y oranges at 0.75.

b) The perimeter of a rectangle with length l and width w.

c) The total number of students in a class if there are $'g'$ girls and 5 more boys than girls.

d) The amount of money left from $50 after buying $'c'$ candies at $1.25 each.

e) The area of a triangle with base $'b'$ and height $'h'$.

f) The average speed if you travel $'d'$ miles in $'t'$ hours.

g) The number of minutes in $'h'$ hours and $'m'$ minutes.

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Q2: Evaluate each expression for the given values of the variables.

$3x + 5 \quad when \quad x = 4$

$2y - 7 \quad when \quad y = -3$

$a^2 + 2b \quad when \quad a = 5, b = 10$

$\dfrac{m + n}{2} \quad when \quad m = 8, n = 4$

$4p - q^2 \quad when \quad p = 3, q = -2$

$\dfrac{1}{2}c + 10 \quad when \quad c = 12$

$5(d - 1) \quad when \quad d = 6$

$x^2 - y^2 \quad when \quad x = 5, y = 3$
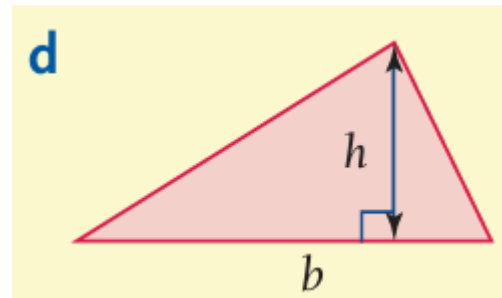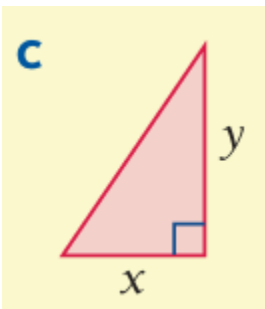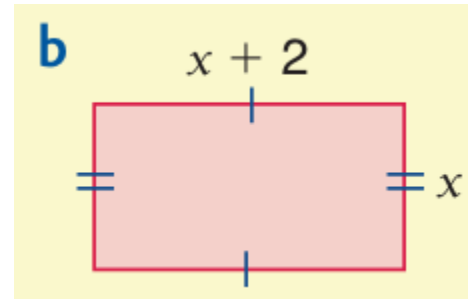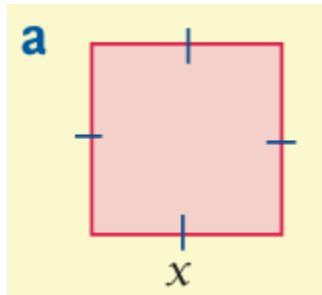
$(a + b)(a - b) \quad when \ a = 7, b = 2$

$3z^3 - 2z + 1 \quad when \ z = -1$

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LEVEL 3: Mastering the Concept

Q1: Write an expression for the area of each figure.

a

b $x + 2$ ... x

c y ... x

d h ... b

Q2: Evaluate the expression when a = 12, b = 5, and c = 2.

❖ $3a + 4$

❖ $\frac{26}{b} + 8.8$

❖ $bc + 11.2$

❖ $5c - 6.7$

❖ $c^2 + \frac{2}{3}$

❖ $\frac{ab}{6} - 3c$

❖ $\frac{a}{5} + 4$

❖ $\frac{a^2}{12} - 2.4$

❖ $\frac{6a}{c} - 2$

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Extra worksheet:

1) Which of these expressions has no constant?

   a) $5x + 2$ b) $4n - 3$ c) $3y$ d) $z + 10$

2) Which of these is a constant?

   a) x b) 7 c) $5 - 2x$ d) $y - 1$

3) A student says in $2x + 4y$, the coefficient is 6.

   What mistake did they make?

4) Write your own algebraic expression with:

   Two variables, One constant, At least two different coefficients

Real-Life Word Problems:

5) Movie Tickets: A movie ticket costs $9. Write an expression to represent the total cost for t

   tickets.

6) Savings Account: You start with $100 in your savings account and decide to deposit $20 each

   week. Write an expression to represent the total amount of money in your account after w

   weeks.

7) Pizza Sharing: A large pizza has 12 slices. You and your friends eat s slices. Write an expression

   to represent the number of slices remaining.