Algebraic Expressions on the Number

A. Choose the correct answer:

1. Which point represents the value of 2x + 3 when x = 1 on the number line?

a) 4 b) 5

c) 6 d) 7

2. If an expression 3x – 2 is plotted on the number line and x = 2, the point will be at:

a) 2 b) 4

c) 6 d) 8

3. Which algebraic expression will give 0 on the number line when x = –2?

a) x + 2 b) x – 2

c) 2x d) 3x + 2

4. The value of the expression 5(x – 2) when x = 3 will be plotted at:

a) 5 b) 15

c) –5 d) 0

5. If x is at position 4 on the number line, what is the value of 2x – 1?

a) 6 b) 7

c) 8 d) 9

B. Write the Missing Terms to Complete the Sentences:

1. When x = 0, the value of the expression 3x + 5 is _____.

2. An algebraic expression plotted on the number line shows _____ values for different inputs.

3. The value of 2x – 3 when x = –1 is _____.

4. To move 2 steps to the right on the number line from 3x, we add _____.

5. An expression like x + 4 represents a _____ on the number line.

C. Mark each sentence with a True (✔) or False (✗):

1. The expression 2x + 3 gives only positive values for all positive x. _____

2. If x = –1, then x + 1 will be at zero on the number line. _____
3. The graph of an algebraic expression is always a straight line on the number line. _____
4. 3x and 2x + 5 will always have the same value at x = 1. _____
5. On the number line, moving to the left indicates increasing values. _____

D. Figure out the answers to these questions:

1. Find and plot the value of 2x + 1 when x = –3, 0, and 2.
2. If the expression is 4x – 5, find the value when x = –2, 0, and 3 and explain how the points would appear on the number line.
3. Draw a rough number line and mark the points for the expression $\frac{x}{2}$ + 1 where x = 0, 2, 4.
4. For which value of x will the expression 3x + 7 give the point 1 on the number line?
5. If 5x – 4 = 6, find the value of x and locate it on the number line.

E. Challenge yourself with these questions:

1. Calculate and plot the value of 3(x + 2) when x = –2, 0, and 2.
2. Write an expression that moves 5 steps left from the point represented by x.
3. Solve for x if 2x + 5 = 9, and mark its value on the number line.
4. Draw a number line and show the values of x – 3 for x = –2, 0, 4.
5. If 4x + 1 lies at point 9 on the number line, find x.