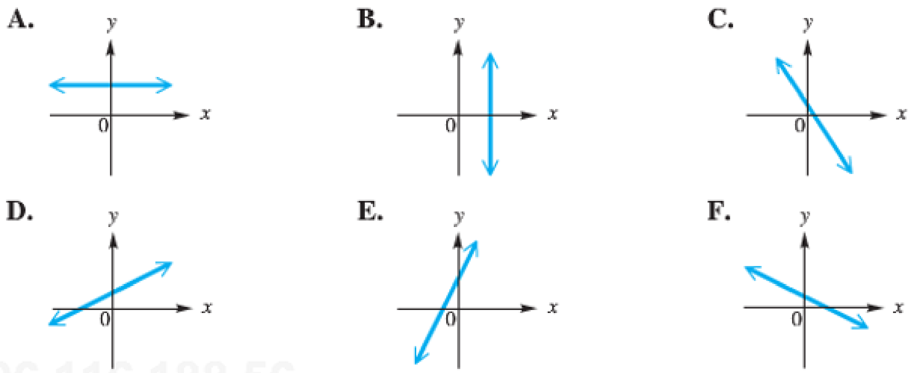
1. Identify the line having the given slope: $\frac{1}{3}$; -3; 0; $-\frac{1}{3}$; 3; $undefined$



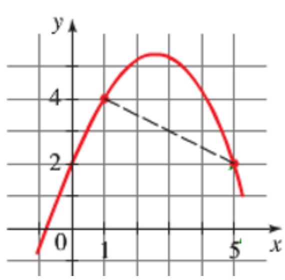
2. **Linear Functions Have Constant Rate of Change**

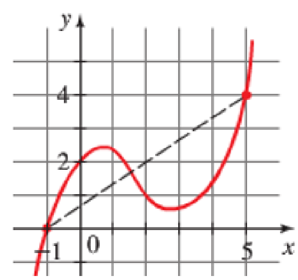
If $f(x) = mx + b$ is a linear function, then the average rate of change of f between any two real numbers x_1 and x_2 is

$$\text{average rate of change} = \frac{f(x_2) - f(x_1)}{x_2 - x_1}$$

Calculate this average rate of change to show that it is the same as the slope m.

3. Determine the average rate of change of the function between the indicated points on the given graph.

a) 

b) 

4. Determine the average rate of change of the function between the given values of the variable.

a) $h(t) = t^2 + 2t$; $t = -1, t = 4$

b) $f(x) = 4 - x^2$; $x = 1, x = 1 + h$

c) $g(x) = \frac{1}{x}$; $x = 1, x = a$

d) $f(t) = \sqrt{t}$; $t = a, t = a + h$

5. Match the description with an equation from column II.

I	II
a linear function whose graph has y-intercept 6	**A.** $f(x) = 5x$
a vertical line	**B.** $f(x) = 3x + 6$
a constant function	**C.** $f(x) = -8$
a linear function whose graph has x-intercept -2 and y-intercept 4	**D.** $f(x) = x^2$
	E. $x + y = -6$
a linear function whose graph passes through the origin	**F.** $f(x) = 3x + 4$
	G. $2x - y = -4$
a function that is not linear	**H.** $x = 9$

6. Write an equation of a line satisfying the following:

   a) passing through $(-1,3)$ and $(3,4)$

   b) with x-intercept 3 and y-intercept -2

   c) passing through $(1,6)$ and perpendicular to $3x + 5y = 1$

   d) passing through $(4,1)$ and parallel to $y = -5$

7. Find k such that the line through $(4,-1)$ and $(k,2)$ is

   a) parallel to $3y + 2x = 6$

   b) perpendicular to $2y - 5x = 1$

8. ***(Modeling) Break-Even Point*** *The manager of a small company that produces roof tile has determined that the total cost in dollars, $C(x)$, of producing x units of tile is given by*

$$C(x) = 200x + 1000,$$

while the revenue in dollars, $R(x)$, from the sale of x units of tile is given by

$$R(x) = 240x.$$

   a) Find the break-even point and the cost and revenue at the break-even point.

   b) Suppose the variable cost is actually \$220 per unit, instead of \$200. How does this affect the break-even point?