

# ROC Practice

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Calculate the average rate of change of the function on the given interval.

1.  $y = x^2 + 3x - 5$ ,  $1 \leq x \leq 4$

2.  $y = 3(x + 5)(x + 3)$ ,  $-2 \leq x \leq -1$

3.  $y = -(x - 8)^2 - 12$ ,  $5 \leq x \leq 6$

4.  $y = 5x^2 + 12x$ ,  $-1 \leq x \leq 0$

5.  $y = (x + 4)^2$ ,  $-10 \leq x \leq -3$

6.  $y = x(x - 9)$ ,  $-4 \leq x \leq -1$

*Review: Converting between the Forms*

7. Convert  $y = -2(x - 4)(x + 3)$  to standard form.

8. Convert  $y = 3(x + 5)^2 - 3$  to standard form.

9. Convert  $y = -4x^2 - 16x$  to vertex form.

10. Convert  $y = x^2 - 4x - 32$  to intercept form.

$$\textcircled{1} y = x^2 + 3x - 5, \quad 1 \leq x \leq 4$$

$$a = 1, \quad b = 4$$

$$f(a) = 1^2 + 3(1) - 5 = 1 + 3 - 5 = -1$$

$$f(b) = 4^2 + 3(4) - 5 = 16 + 12 - 5 = 23$$

$$\frac{23 - (-1)}{4 - 1}$$

$$\frac{24}{3} = \textcircled{8}$$

$$\textcircled{2} y = 3(x+5)(x+3), \quad -2 \leq x \leq -1$$

$$a = -2, \quad b = -1$$

$$f(a) = 3(-2+5)(-2+3) = 3(3)(1) = 9$$

$$f(b) = 3(-1+5)(-1+3) = 3(4)(2) = 24$$

$$\frac{24 - 9}{-1 - (-2)}$$

$$\frac{15}{1} = \textcircled{15}$$

$$\textcircled{3} y = -(x-8)^2 - 12, \quad 5 \leq x \leq 6$$

$$a = 5, \quad b = 6$$

$$f(a) = -(5-8)^2 - 12 = -9 - 12 = -21$$

$$f(b) = -(6-8)^2 - 12 = -4 - 12 = -16$$

$$\frac{-16 - (-21)}{6 - 5}$$

$$\frac{5}{1} = \textcircled{5}$$

$$\textcircled{4} y = 5x^2 + 12x, \quad -1 \leq x \leq 0$$

$$a = -1, \quad b = 0$$

$$f(a) = 5(-1)^2 + 12(-1) = 5 - 12 = -7$$

$$f(b) = 5(0)^2 + 12(0) = 0$$

$$\frac{0 - (-7)}{0 - (-1)}$$

$$\frac{7}{1} = \textcircled{7}$$

$$\textcircled{5} y = (x+4)^2, \quad -10 \leq x \leq -3$$

$$a = -10, \quad b = -3$$

$$f(a) = (-10+4)^2 = 36$$

$$f(b) = (-3+4)^2 = 1$$

$$\frac{1 - (36)}{-3 - (-10)}$$

$$\frac{-35}{7} = \textcircled{-5}$$

$$\textcircled{6} \quad y = x(x-9), \quad -4 \leq x \leq -1$$

$$a = -4, \quad b = -1$$

$$f(a) = -4(-4-9) = -4(-13) = 52$$

$$f(b) = -1(-1-9) = -1(-10) = 10$$

$$\frac{10-52}{-1-(-4)}$$

$$\frac{-42}{3} = \textcircled{-14}$$

$$\textcircled{7} \quad y = -2(x-4)(x+3)$$

$$= -2(x^2 + 3x - 4x - 12)$$

$$= -2(x^2 - 1x - 12)$$

$$\textcircled{y = -2x^2 + 2x + 24}$$

$$\textcircled{8} \quad y = 3(x+5)^2 - 3$$

$$= 3(x+5)(x+5) - 3$$

$$= 3(x^2 + 5x + 5x + 25) - 3$$

$$= 3(x^2 + 10x + 25) - 3$$

$$= 3x^2 + 30x + 75 - 3$$

$$\textcircled{y = 3x^2 + 30x + 72}$$

$$\textcircled{9} \quad y = -4x^2 - 16x$$

$$x = \frac{-(-16)}{2(-4)} = \frac{16}{-8} = -2$$

$$y = -4(-2)^2 - 16(-2)$$

$$= -16 + 32 = 16$$

$$h = -2, \quad k = 16, \quad a = -4$$

$$\textcircled{y = -4(x+2)^2 + 16}$$

$$\textcircled{10} \quad y = x^2 - 4x - 32$$

$$-8 \cdot 4 = -32$$

$$-8 + 4 = -4$$

$$y = x^2 - 8x + 4x - 32$$

	x	-8
x	x <sup>2</sup>	-8x
4	4x	-32

$$\textcircled{y = (x-8)(x+4)}$$