

1. Find the equation of the tangent line to the graph of the given function at the given point:

$$f(x) = x - 3x^2; \quad P(-2, -14)$$

2. Find the equation of the tangent line to the graph of the given function at the given point:

$$f(x) = -1 + 2x + 3x^2; \quad P(0, -1)$$

3. Find the equation of the tangent line to the graph of the given function at the given point:

$$f(x) = -2 - x^2; \quad P(2, -6)$$

4. Find the equation of the tangent line to the graph of the given function at the given point:

$$f(x) = x - x^2; \quad P(0, 0)$$

5. Find the equation of the tangent line to the graph of the given function at the given point:

$$f(x) = -3 + 2x + x^2; \quad P(3, 12)$$

6. Find the equation of the tangent line to the graph of the given function at the given point:

$$f(x) = -3 + 2x - 2x^2; \quad P(3, -15)$$

7. Find the equation of the tangent line to the graph of the given function at the given point:

$$f(x) = 1 - 2x + x^2; \quad P(0, 1)$$

8. Find the equation of the tangent line to the graph of the given function at the given point:

$$f(x) = 3 + 2x - 3x^2; \quad P(1, 2)$$

9. Find the equation of the tangent line to the graph of the given function at the given point:

$$f(x) = 3 - 2x^2; \quad P(-1, 1)$$

10. Find the equation of the tangent line to the graph of the given function at the given point:

$$f(x) = 2 + x + 3x^2; \quad P(0, 2)$$

6. $y = 8x - 12$ 5. $y = 8x - 12$ 4. $y = 1x0$ 3. $y = -4x + 2$ 2. $y = 2x - 1$ 1. $y = 13x + 12$ 7. $y = -2x + 1$ 8. $y = -4x + 6$ 9. $y = 4x + 5$ 10. $y = 1x + 2$

Answers:

Solutions:

$$1. f'(x) = \frac{d}{dx}(x - 3x^2) = 1 - 6x \quad \blacktriangleleft \text{ Find the first derivative of the function.}$$

$$m = f'(-2) = 1 - 6(-2) = 13 \quad \blacktriangleleft \text{ Find the slope of the tangent line at the given point P.}$$

$$y - (-14) = 13[x - (-2)] \quad \blacktriangleleft \text{ Use the Point-Slope formula: } y - y_1 = m(x - x_1) \quad \blacktriangleright \text{ Then simplify:}$$

$$y = 13x + 12$$

$$2. f'(x) = \frac{d}{dx}(-1 + 2x + 3x^2) = 2 + 6x \quad \blacktriangleleft \text{ Find the first derivative of the function.}$$

$$m = f'(0) = 2 + 6(0) = 2 \quad \blacktriangleleft \text{ Find the slope of the tangent line at the given point P.}$$

$$y - (-1) = 2[x - (0)] \quad \blacktriangleleft \text{ Use the Point-Slope formula: } y - y_1 = m(x - x_1) \quad \blacktriangleright \text{ Then simplify:}$$

$$y = 2x - 1$$

$$3. f'(x) = \frac{d}{dx}(-2 - x^2) = -2x \quad \blacktriangleleft \text{ Find the first derivative of the function.}$$

$$m = f'(2) = -2(2) = -4 \quad \blacktriangleleft \text{ Find the slope of the tangent line at the given point P.}$$

$$y - (-6) = -4[x - (2)] \quad \blacktriangleleft \text{ Use the Point-Slope formula: } y - y_1 = m(x - x_1) \quad \blacktriangleright \text{ Then simplify:}$$

$$y = -4x + 2$$

$$4. f'(x) = \frac{d}{dx}(x - x^2) = 1 - 2x \quad \blacktriangleleft \text{ Find the first derivative of the function.}$$

$$m = f'(0) = 1 - 2(0) = 1 \quad \blacktriangleleft \text{ Find the slope of the tangent line at the given point P.}$$

$$y - (0) = 1[x - (0)] \quad \blacktriangleleft \text{ Use the Point-Slope formula: } y - y_1 = m(x - x_1) \quad \blacktriangleright \text{ Then simplify:}$$

$$y = x$$

$$5. f'(x) = \frac{d}{dx}(-3 + 2x + x^2) = 2 + 2x \quad \blacktriangleleft \text{ Find the first derivative of the function.}$$

$$m = f'(3) = 2 + 2(3) = 8 \quad \blacktriangleleft \text{ Find the slope of the tangent line at the given point P.}$$

$$y - (12) = 8[x - (3)] \quad \blacktriangleleft \text{ Use the Point-Slope formula: } y - y_1 = m(x - x_1) \quad \blacktriangleright \text{ Then simplify:}$$

$$y = 8x - 12$$

$$6. f'(x) = \frac{d}{dx}(-3 + 2x - 2x^2) = 2 - 4x \quad \blacktriangleleft \text{ Find the first derivative of the function.}$$

$$m = f'(3) = 2 - 4(3) = -10 \quad \blacktriangleleft \text{ Find the slope of the tangent line at the given point P.}$$

$$y - (-15) = -10[x - (3)] \quad \blacktriangleleft \text{ Use the Point-Slope formula: } y - y_1 = m(x - x_1) \quad \blacktriangleright \text{ Then simplify:}$$

$$y = -10x + 15$$

$$7. f'(x) = \frac{d}{dx}(1 - 2x + x^2) = -2 + 2x \quad \blacktriangleleft \text{ Find the first derivative of the function.}$$

$$m = f'(0) = -2 + 2(0) = -2 \quad \blacktriangleleft \text{ Find the slope of the tangent line at the given point P.}$$

$$y - (1) = -2[x - (0)] \quad \blacktriangleleft \text{ Use the Point-Slope formula: } y - y_1 = m(x - x_1) \quad \blacktriangleright \text{ Then simplify:}$$

$$y = -2x + 1$$

$$8. f'(x) = \frac{d}{dx}(3 + 2x - 3x^2) = 2 - 6x \quad \blacktriangleleft \text{ Find the first derivative of the function.}$$

$$m = f'(1) = 2 - 6(1) = -4 \quad \blacktriangleleft \text{ Find the slope of the tangent line at the given point P.}$$

$$y - (2) = -4[x - (1)] \quad \blacktriangleleft \text{ Use the Point-Slope formula: } y - y_1 = m(x - x_1) \quad \blacktriangleright \text{ Then simplify:}$$

$$y = -4x + 6$$

9. $f'(x) = \frac{d}{dx}(3 - 2x^2) = -4x$ ◀ Find the first derivative of the function.

$m = f'(-1) = -4(-1) = 4$ ◀ Find the slope of the tangent line at the given point P.

$y - (1) = 4[x - (-1)]$ ◀ Use the Point-Slope formula: $y - y_1 = m(x - x_1)$ ▶ Then simplify:

$$y = 4x + 5$$

10. $f'(x) = \frac{d}{dx}(2 + x + 3x^2) = 1 + 6x$ ◀ Find the first derivative of the function.

$m = f'(0) = 1 + 6(0) = 1$ ◀ Find the slope of the tangent line at the given point P.

$y - (2) = 1[x - (0)]$ ◀ Use the Point-Slope formula: $y - y_1 = m(x - x_1)$ ▶ Then simplify:

$$y = x + 2$$