

Assignment Gradient Function, Gradient of tangent and Equation of tangent**Use the definition of the derivative to find the derivative of each function with respect to x .**

1) $y = 5x^2 + 5x - 1$

2) $y = 5x^2 + 5$

3) $y = 3x + 2$

4) $y = 4x^2 + x - 3$

For each problem, find the derivative of the function at the given value.

5) $y = 2x^2 - 4x$ at $x = -1$

6) $y = -x^2 + 6x - 10$ at $x = 3$

7) $y = x^2 + 2x$ at $x = -3$

8) $y = x^2 - 6x + 11$ at $x = 1$

For each problem, find the equation of the line tangent to the function at the given point. Your answer should be in slope-intercept form.

9) $y = -x^3 + x^2 + 3$ at $(0, 3)$

10) $y = 2x^2 + 8x + 6$ at $(-2, -2)$

11) $y = x^3 - 3x^2$ at $(2, -4)$

12) $y = -x^3 + 2x^2$ at $(0, 0)$

Answers to Assignment Gradient Function, Gradient of tangent and Equation of tangent

$$1) \frac{dy}{dx} = 10x + 5$$

$$2) \frac{dy}{dx} = 10x$$

$$3) \frac{dy}{dx} = 3$$

$$4) \frac{dy}{dx} = 8x + 1$$

$$5) \left. \frac{dy}{dx} \right|_{x=-1} = -8$$

$$6) \left. \frac{dy}{dx} \right|_{x=3} = 0$$

$$7) \left. \frac{dy}{dx} \right|_{x=-3} = -4$$

$$8) \left. \frac{dy}{dx} \right|_{x=1} = -4$$

$$9) y = 3$$

$$10) y = -2$$

$$11) y = -4$$

$$12) y = 0$$