

1. Given:  $f(x) = x^2 + 3x - 5$

a. Find the general derivative,  $f'(x)$ .

b. Find the slope of this curve at  $x = -4$ .

c. What is the slope of the tangent line at  $x = 2$ ?

d. Write the equation of the line tangent to this curve at  $x = 2$ .

e. Write the equation of the line normal to this curve at  $x = 2$ .

f. Write the equation of the horizontal tangent to this curve.

g. What is the instantaneous rate of change at  $x = 5$  ?

h. Write the equation of the line tangent to this curve at  $x = -1$ .

2. Given:  $y = 3x^2 - x$

a. Find  $\frac{dy}{dx}$ .

b. Find the slope of this curve at  $x = 5$ .

c. What is the slope of the tangent line at  $x = -1$ ?

d. Write the equation of the line tangent to this curve at  $x = -1$ .

e. Write the equation of the line normal to this curve at  $x = -1$ .

f. Write the equation of the horizontal tangent to this curve.

3. Find the general derivative for  $y = x^2 - 6x + 2$