

Given $f(x) = 3x^3 - 5x + 4$ find the difference quotient given by,

$$\frac{f(a+h) - f(a)}{h}.$$

A hotel chain charges \$75 each night for the first two nights and \$50 for each additional night's stay. The total cost T is a function of the number of nights x that a guest stays.

a. Complete the expressions in the following piecewise defined function.

$$T(x) = \begin{cases} & \text{if } & x \\ & \text{if } & x \end{cases}$$

b. Find $T(2)$, $T(3)$, $T(5)$.

c. What do your answers in part (b) represent?

Given $f(x) = x^3 - 4x^2$ find the following:

a. $f(0)$

b. $f(1)$

c. $f(-1)$

d. $f\left(\frac{3}{2}\right)$

e. $f\left(\frac{x}{2}\right)$

f. $f(x^2)$

Graph the following functions by making a table.

a. $f(x) = \frac{x - 3}{2}$

b. $g(x) = \sqrt{-x}$