(Find the derivative using limit process)

Use the limit process to find the slope of the graph of the function at the specified point

1. $(x) = x^2 - 2x$, at $(3,3)$

2. $f(x) = 10x - 2x^2$, at $(3,12)$

3. $f(x) = \dfrac{1}{x-2}$, at $\left(4, \dfrac{1}{2}\right)$

4. $g(x) = \sqrt{x+10}$, at $(-1,3)$

Find the slope of the graph of f at the given point. Use the result to find an equation of the tangent line to the graph at the point.

5. $f(x) = x^2 - 1, (2,3)$

6. $g(x) = x^3 - x, (2,6)$

7. $h(x) = x^2 - 2x - 1, (1,-2)$

Tangent Lines and the Derivative

In exercises #1-4, use the limit process to find the slope of the graph of the function at the specified point.

1. $g(x) = 4 - 3x$, at $(1, 1)$

2. $g(x) = x^2 - 2x$, at $(3, 3)$

3. $g(x) = \dfrac{4}{x}$, at $(2, 2)$

4. $h(x) = \sqrt{x}$, at $(9, 3)$

In exercises 5 and 6:

      a. *Find the formula for the slope of the curve (general formula).*
      b. *Then use the formula to find the slope at each of the points.*

5. $g(x) = 4 - x^2$; at $(0, 4)$ *and* $(-1, 3)$

6. $g(x) = \dfrac{1}{x+4}$; at $\left(0, \dfrac{1}{4}\right)$ *and* $\left(-2, \dfrac{1}{2}\right)$

In exercises 7 and 8, find the derivative of the function.

7. $g(x) = 6 - \dfrac{2}{3}x$

8. $f(x) = \dfrac{1}{x^2}$

In exercises 9 and 10, find the slope of the graph of f at the given point. Use the result to find the <u>equation</u> of the tangent line to the graph at the point. Use your graphing calculator to draw a sketch of f and the tangent line.

9. $f(x) = x^3 - x$; $(2, 6)$

10. $f(x) = \sqrt{x+1}$; $(3, 2)$