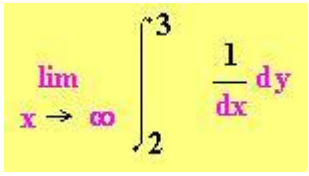

THE DERIVATIVE

Prepared by Ingrid Stewart, Ph.D., College of Southern Nevada
Please Send Questions and Comments to ingrid.stewart@csn.edu. Thank you!

Problem 1:

Given $f(x) = 3x^2 + 4x - 5$, find $f'(x) = \lim_{h \to 0} \frac{f(x+h) - f(x)}{h}$.

Problem 2:

Differentiate the function $f(x) = x - x^2$.

Problem 3:

Find the derivative of $f(x) = \frac{1}{x^2}$.

Problem 4:

Find the instantaneous rate of change of the function $f(x) = \sqrt{x}$.

Problem 5:

a. Find the slope of the line tangent to the point $(-1,2)$ on the function $f(x) = x^3 - 3x$ using the *Difference Quotient* $\frac{f(x+h) - f(x)}{h}$.

b. Find the slope of the line tangent to the point $(-1,2)$ on the function $f(x) = x^3 - 3x$ using the alternative form of the derivative, that is, $f'(c) = \lim_{x \to c} \frac{f(x) - f(c)}{x - c}$.

Problem 6:

Find the equation of the line tangent to the point $(-1,2)$ on the function $f(x) = x^3 - 3x$.
See Problem 5 above!

SOLUTIONS

You can find detailed solutions below the link for this problem set!

1. $6x + 4$	2. $1 - 2x$	3. $\frac{-2}{x^3}$
4. $\frac{1}{2\sqrt{x}}$	5. 0	6. $y = 2$