

TI-83 Lab 6 For Mathematics 223

Topics: derivatives, drawing tangent lines, drawing derivatives

Derivatives. Calculate derivative of $f(x) = \frac{x^2-3x}{4x^3-5}$ at $x = -1$ and $x = 1.5$.

1. Type function into "Y₁ =".
2. MATH 8:nDeriv(X, Y₁, -1) ENTER will return a value of -0.0370
3. MATH 8:nDeriv(X, Y₁, 1.5) ENTER will return a value of 0.8408

Drawing Tangents. Draw tangent lines to $f(x) = \frac{x^2-3x}{4x^3-5}$ at $x = -1$ and $x = 1.5$.

1. Type WINDOW and set: Xmin = -5, Xmax = 5, Xscl = 1, Ymin = -5, Ymax = 5, Yscl = 1, Xres = 1.
2. Then graph the function by typing GRAPH.
3. To get first tangent at $x = -1$, type 2nd DRAW 5:Tangent(ENTER, then $x = -1$ ENTER. A tangent is drawn and the equation of this tangent is approximately:

$$y = -0.0370x - 0.4814$$

4. To get second tangent at $x = 1.5$, type 2nd DRAW 5:Tangent(ENTER, then $x = 1.5$ ENTER. A tangent is drawn and the equation of this tangent is approximately:

$$y = 0.8408x - 1.525$$

Graphing Derivatives. Calculate derivative of $f(x) = \frac{x^2-3x}{4x^3-5}$ at $x = -1$, $x = 1.5$ and also draw derivative function between $x = -5$ and $x = 5$.

1. Type WINDOW and set: Xmin = -5, Xmax = 5, Xscl = 1, Ymin = -5, Ymax = 5, Yscl = 1, Xres = 1.
2. Type the function into "Y₁ =", then GRAPH.
3. To get first derivative at $x = -1$, type 2nd CALC $\frac{dy}{dx}$ then X and Y₁ and -1 then ENTER
4. To get second derivative at $x = 1.5$, type 2nd CALC $\frac{dy}{dx}$ then X and Y₁ and 1.5 then ENTER
5. To draw derivative between $x = -5$ and $x = 5$, type into "Y₂ =" by 2nd CALC $\frac{dy}{dx}$ then X and Y₁ and X then ENTER
6. Graph both function and derivative by typing GRAPH.