1. Find the derivative of the function shown below.

$$y=\left(x+1\right)^{2}\left(x^{2}+1\right)^{-3}$$

1. Find dy/dt

$$y=5t\left(2t+3\right)^{3}$$

1. Use implicit differentiation to find dy/dx

$$x^{3}+3x^{2}y+y^{3}=8$$

1. Find the derivative of y with respect to x, t, or 0 as appropriate.

$$y=x^{5}In x-\frac{1}{3}x^{3}$$

1. A piece of land is shaped like a right triangle. Two people start at the right angle of the triangle at the same time, and walk at the same speed along different legs of the triangle. If the area formed by the positions of the two people and their starting point (the right angle) is changing at $2m^{2}/s$, then how fast are the people moving when they are 5 m from the right angle?
2. Find the absolute extreme values of the function shown below on the given interval

$$g\left(x\right)=-x^{2}+11x-28, 4\leq x\leq 7$$

1. Find the value or values of c that satisfy the equation $\frac{f\left(b\right)-f\left(a\right)}{b-a}=f'(c)$in the conclusion of the Mean Value Theorem for the function and interval shown below.

$$f\left(x\right)=x^{2}+3x+3, [-1, 2]$$

1. Determine all critical points for the function

$$f\left(x\right)=x^{3}-3x^{2}+3 $$

1. Using the First and Second Derivative tests as appropriate, determine all local extrema

$$h\left(x\right)=\frac{x-2}{x^{2}+3x+6}$$

1. Find the equation of the tangent line to the curve whose function is shown below at the given point.

$$y^{5}+x^{3}=y^{2}+9x, tangent at (0, 1)$$