

Derivatives for Section 4.5 homework problems

Please use the derivatives given here as necessary to complete steps **E. Intervals of Increase or Decrease**, **F. Local Maximum and Minimum Values**, and **G. Concavity and Points of Inflection**. The derivatives here are already simplified – there is no need here (or ever!) to multiply or “foil” factors. [Note, there are 10 computed derivatives here that need to be essentially perfect in order to complete the problems.]

$$4.5.13: \quad y = \frac{x}{x^2 - 4}, \quad y' = -\frac{x^2 + 4}{(x^2 - 4)^2}, \quad y'' = \frac{2x(x^2 + 12)}{(x + 2)^3(x - 2)^3}$$

$$4.5.15: \quad y = \frac{x^2}{x^2 + 3}, \quad y' = \frac{6x}{(x^2 + 3)^2}, \quad y'' = \frac{-18(x + 1)(x - 1)}{(x^2 + 3)^3}$$

$$4.5.28: \quad y = \frac{x}{\sqrt{x^2 - 1}}, \quad y' = \frac{-1}{(x^2 - 1)^{3/2}}, \quad y'' = \frac{3x}{(x^2 - 1)^{5/2}}$$

$$4.5.42: \quad y = (1 - x)e^x, \quad y' = -xe^x, \quad y'' = -(x + 1)e^x$$