

In class work 7 has questions 1 through 3 with a total of 6 points. Turn in your work at the end of class *on paper*. This assignment is due *Wednesday 5 October at 13:15 PM*.

1. Find $\frac{dy}{dx}$ and $\frac{d^2y}{dx^2}$ evaluated at $(x = 1/\sqrt{2}, y = 1/\sqrt{2})$ given $x^2 + y^2 = 1$.

- 1 2. The equation $xy = y - 1 + e^{-y}$ defines¹ y as a function of x . Find a formula for $\frac{dy}{dx}$.

¹This problem is motivated by an unpublished mathematical model of hemoglobin glycation.

3. Find a formula for each derivative

$\boxed{1}$ (a) $\frac{d}{dx} [\ln(x(x-1))]$

$\boxed{1}$ (b) $\frac{d}{dx} [\tan^{-1}(x^2)]$

$\boxed{1}$ (c) $\frac{d}{dx} [\csc^{-1}(1/x^2)]$

$\boxed{1}$ (d) $\frac{d}{dx} [x \tan^{-1}(x)]$

$\boxed{1}$ (e) $\frac{d}{dx} [\cot^{-1}(x) + \tan^{-1}(x)]$