

Show all work. Unjustified answers will be treated with skepticism.

1. Section 10.2, Number 15.

(a) Find dy/dx and d^2y/dx^2 , where

$$x = \sin(\pi t), \quad y = \cos(\pi t)$$

(b) **Extra Credit:** Find two points (report as (x, y)): one where the tangent line is horizontal, and one where the tangent line is vertical. (Please do the rest of this quiz first!)

2. Section 11.1, Number 9. Find a formula for the general n^{th} term in the sequence, assuming the pattern of the first few terms continued:

$$\left\{ 1, \frac{-2}{3}, \frac{4}{9}, \frac{-8}{27}, \dots \right\}$$

3. Section 11.1, Number 19. Determine whether the sequence converges or diverges. If it converges, find the limit.

$$a_n = \frac{2^n}{3^{n+1}}$$