Name: _____

TA's Name: _

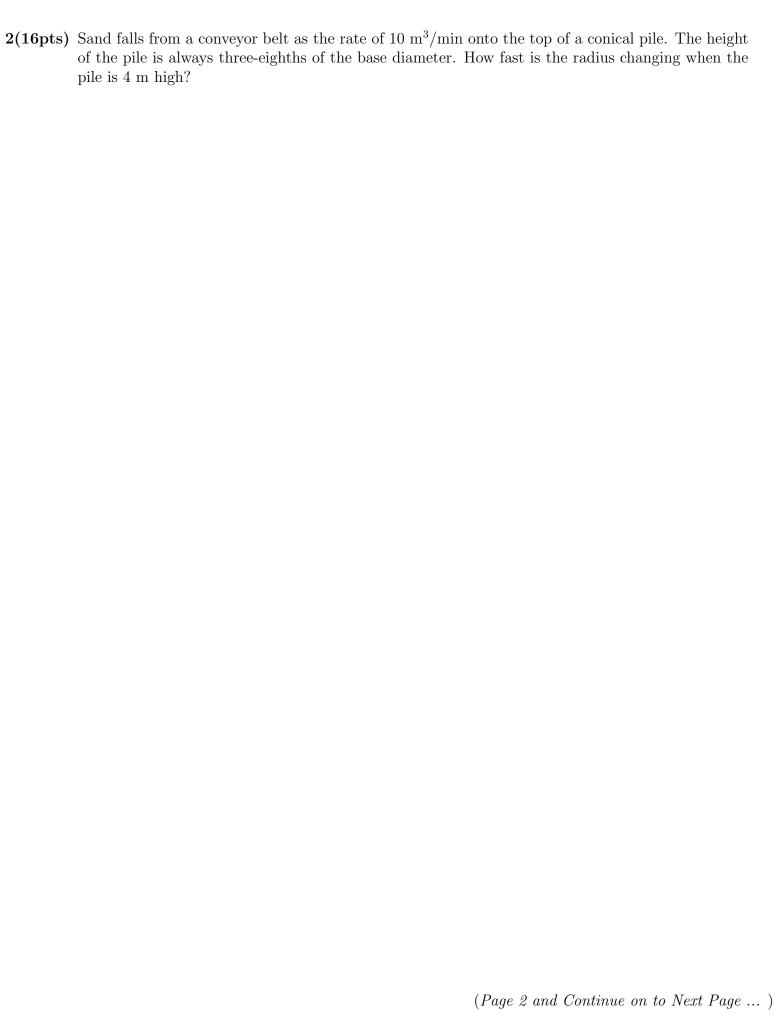
Instructions: You must show supporting work as much as possible to receive full and partial credits. No text book, notes, formula sheets allowed.

1(18pts) Let $y = f(x) = x^5 + 37x$.

(a) Find an equation for the tangent line of the function y = f(x) at x = 1.

(b) Find the value of dy when x = 1 and $\Delta x = 0.2$.

(c) It is given that for a function y = g(x), g(2) = 1, g'(2) = 0.2. Approximate the value g(1.8) and justify your answer.





4(16pts) Find the following limits. (Calculator read-off answers receive no credit.)

(a)
$$\lim_{x \to 0^+} \frac{\ln(x^2 + 2x)}{\ln x}$$

(a)
$$\lim_{x \to +\infty} x^2 e^{-x}$$

5(18pts) The first and second derivatives of the function $y = xe^{1/x}$ are given as

$$y' = e^{1/x} \left(1 - \frac{1}{x} \right),$$
 $y'' = \frac{e^{1/x}}{x^3}$

Sketch the graph of the function, including these information: intercept points, horizontal and vertical asymptotes, extrema and intervals of monotonicity, inflection points and intervals of concavity. (Calculator read-off answers receive no credit.)

16pts)	A rectangle has its base on the x-axis and its upper two vertices on the part is the largest area the rectangle can have, and what are its dimensions?	cabola $y = 1$	$12 - x^2$. What
a D	nus Points: True or False: Test 3 will be on a Tuesday	(D C	and The En