

Name: _____

Date: _____

Instructions: Though calculators can be used for all the questions, all problems require you to show your work. Any answer without proper justification will receive **ZERO** credit. Only **EXACT** answers will receive full credit unless otherwise noted.

1. a) Determine $L(x)$ for $f(x) = 8(3x - 1)^{\frac{2}{3}}$ for $x = 3$

b) use $L(x)$ to approximate $f(x)$ at $x = 3.1$

2. Use differentials to approximate the change in the volume of a sphere when its radius changes from $r = 2$ in to $r = 2.07$ in.