

1. (1 pt) The circumference of a sphere was measured to be 81.000 cm with a possible error of 0.50000 cm. Use linear approximation to estimate the maximum error in the calculated surface area. _____

Estimate the relative error in the calculated surface area. _____

2. (1 pt) Suppose that you can calculate the derivative of a function using the formula $f'(x) = 4f(x) + 3x$. If the output value of the function at $x = 3$ is 6 estimate the value of the function at 3.005. _____

3. (1 pt) Let $y = 4x^2$.
Find the change in y , Δy when $x = 2$ and $\Delta x = 0.1$ _____

Find the differential dy when $x = 2$ and $dx = 0.1$ _____

4. (1 pt) Use linear approximation, i.e. the tangent line, to approximate $\sqrt{25.2}$ as follows:

Let $f(x) = \sqrt{x}$. The equation of the tangent line to $f(x)$ at $x = 25$ can be written in the form $y = mx + b$ where m is: _____ and where b is: _____

Using this, we find our approximation for $\sqrt{25.2}$ is _____

NOTE: For this part, give your answer to at least 9 significant figures or use fractions to give the exact answer.

5. (1 pt) The linear approximation at $x = 0$ to $\frac{1}{\sqrt{5-x}}$ is $A + Bx$ where A is: _____ and where B is: _____