Calculus Worksheet #1 Unit 8 page 1 _____

For each of the following functions, express dy in terms of x and dx.

1. $y = x^3$

dy = _____

2. $y = 3x^2 + 5x - 1$

dy = _____

3. $y = \sin x$

dy = _____

4. $y = \sqrt{x}$

dy = _____

5. $y = \tan(5x)$

dy = _____

6. $y = \cos(1 - x^2)$

dy = _____

Use differentials to approximate each of the following. Show your work neatly organized.

7. $\sqrt{50}$

8. $\sqrt{15.5}$

9. $\sqrt[3]{27.3}$

10. $\sqrt[3]{7.9}$

Calculus Worksheet #1 Unit 8 page 2

Use differentials to answer each of the following questions. Show your work neatly organized.

11. A brass sphere with a diameter of 1 inch is given a gold plating which is .005 inches thick. What is the approximate volume of gold used?
(For a sphere, $V = (4/3)\pi r^3$.)

12. A thin cylindrical shell is h inches tall and has an inner radius of r inches. If the shell is $\triangle r$ inches thick, then what formula can be used to approximate its volume.
(For a cylinder, $V = \pi r^2 h$.)