Calculus Worksheet #3 Unit 8 page 1 _____

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

1. $y = 5x + 3$

dy = _____

2. $y = (1 - 2x^3)^4$

dy = _____

3. $y = \cot(3x^2)$

dy = _____

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

4. $\sqrt{15.8}$

5. $\sqrt{127}$

6. $\sqrt[3]{0.9}$

7. $\sqrt[3]{64.2}$

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

8. Find the approximate change in cos x per 1 degree change in x for each of the following values of x.

a) $x = 0$ **b)** $x = \pi/6$ **c)** $x = \pi/3$ **d)** $x = \pi/2$

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

9. A steel ball with a diameter of 2 inches is given a gold plating which is .02 inches thick. What is the approximate volume of gold used?
(For a sphere, $V = (4/3)\pi r^3$.)

10. A steel cabinet is to be in the shape of a cube, measuring 20 inches on each side, with a greatest possible error allowed of 0.1 inches. (Measurements like this can be written as 20 ± 0.1 inches.) What is the greatest possible error that can result in the volume of the cabinet?