

Group Work 2 - Math 165

Names: _____

Turn in one copy of your work and answers with all names of the group members on it. Show all work on each problem to receive credit for this exercise. You may not consult with other groups, but you may use your book and notes and ask questions of the instructor. This exercise counts as one quiz score.

1. The radius of a sphere is increasing at a constant rate of 2 centimeters per second. How fast is the volume of the sphere increasing when the radius of the sphere is 3 centimeters?
2. Let n be an positive integer multiple of 4. Find $\frac{d^n y}{dx^n}$ if $y = \cos(2x)$.
3. Find $\frac{dy}{dx}$ if $\cot(xy^2) + x^2y^2 = 10\sqrt{y}$.
4. A ladder of length 20 feet is begins sliding down the side of the building against which it is leaning. If the upper end of the ladder is sliding down at a rate of 4 feet per second, how fast is the *angle* between the ground and the ladder changing when the top of the ladder is 10 feet above ground? (You may assume the ground is flat and the building is perpendicular to the ground.)
5. Find the *equation* of the normal line (line perpendicular to the tangent line) to the curve $2x^2 + xy = y^2$ at the point $(1, 2)$.