

MATH 151
Mrs. Bonny Tighe

QUIZ 4
25 points
3.9,3.10

NAME _____

SECTION _____ Fri 3/10/06

1. Water is being pumped into a conical tank. The tank has height of 6 m and the radius of the base is 2 m. How fast is the volume of the water increasing when the height of the water is rising at 2 m per minute, and the water is 3 m deep? $V = \frac{1}{3} \pi r^2 h$

2. A spherical snowball is melting so that its volume is decreasing at a rate of $20 \text{ cm}^3/\text{sec}$. Find the rate at which the radius is decreasing when the radius is 5 cm.

$$V = \frac{4}{3} \pi r^3$$

3. Use linear approximation to estimate $\sqrt{25.5}$

4. Use linear approximation to estimate $\tan 61^\circ$

5. Find the linearization, $L(x)$, for $f(x)$ at a when $f(x) = \sin^3 x$ and $a = \pi/6$.

6. A 20-foot ladder rests against a vertical wall. If the bottom of the ladder slides away from the wall at a speed of 4 ft/sec, how fast is the angle between the bottom of the ladder and the ground decreasing when the top of the ladder is 8 feet from the ground?

7. Two hikers start walking from the same point. One is walking south at 4 mph and the other is walking east at 3 mph. At what rate is the distance between the two hikers increasing one hour later?