

MATH 151
Mrs. Bonny Tighe

QUIZ 4A
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 3 m. How fast is the volume of the water increasing when the height of the water is rising at 0.5 m per minute, and the water is 3 m deep? $V = \frac{1}{3} \pi r^2 h$

2. Two hikers start walking from the same point. One is walking north at 4 mph and the other is walking west at 5 mph. At what rate is the distance between the two hikers increasing after 1 hour?

3. A 20-foot ladder rests against a vertical wall. If the bottom of the ladder slides away from the wall at a speed of 5 ft/sec, how fast is the angle between the bottom of the ladder and the ground decreasing when the top of the ladder is 10 feet from the ground?

4. A spherical snowball is melting so that its volume is decreasing at a rate of $10 \text{ cm}^3/\text{sec}$. Find the rate at which the radius is decreasing when the radius is 5 cm.

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

5. Use linear approximation to estimate $\sqrt{35.5}$

6. Use linear approximation to estimate $\sin 30.5^\circ$

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