QUIZ 7 - MATH 112

Friday, March 25

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YOUR NAME:_____

Read each problem **very carefully** before starting to solve it. Each problem is worth around 5 points. It is necessary to show **all** your work. Correct answers without explanations are worth 0 points. GOOD LUCK!!

1. [5 points] Find an equation for the tangent line to $-y + x^2 = \dfrac{2x}{y}$ at the point $(x, y) = (-1, 2)$.

   (**Hint**: You may use the equation as is, but it may be easier and faster to get rid of denominators first, by multiplying both sides by y, but do this carefully!!)

2. [5 points] Suppose that a right circular ice cone has height equal to twice its radius and that, as it is melting, its volume is decreasing at the rate of 2π cubic inches per minute, while the proportion between height and radius is maintained. Find the rate at which its radius is decreasing when its radius is exactly $\frac{1}{2}$ inches long.

(The volume of a rectangular cone whose height is twice as long as its radius is given by $V = \dfrac{2\pi}{3}r^3$, where r is the length of its radius.)
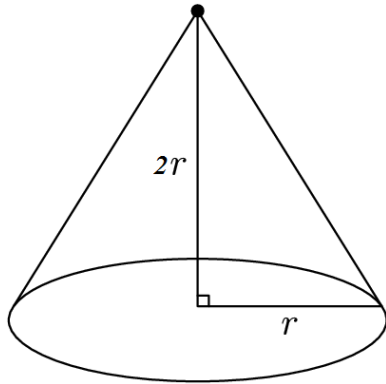
3. [4 points] Solve the equation

$$\frac{1}{16} \cdot 4^{3x} \cdot 8^{1-5x} = 32^x.$$

(**Hint**: Use properties of exponents carefully to convert each side to a single exponential over base 2.)