EXAM 3 - MATH 112   Friday, November 1
## YOUR NAME:_____   George Voutsadakis

Read each problem **very carefully** before starting to solve it. Each problem is worth 10 points. It is necessary to show **all** your work. Correct answers without explanations are worth 0 points. GOOD LUCK!!

1. A small convenience store owner sells 50 candy rolls per day at the price of $75^{\text{¢}}$ each. He estimates that, for every $5^{\text{¢}}$ reduction in price, 10 more candy rolls will be sold per day. Which price should the owner charge for the candies to maximize his revenue from the sale of this item?

2. Find an equation for the tangent line to the graph of $2x^3y - xy^3 = 14y$ at $(2, 1)$.
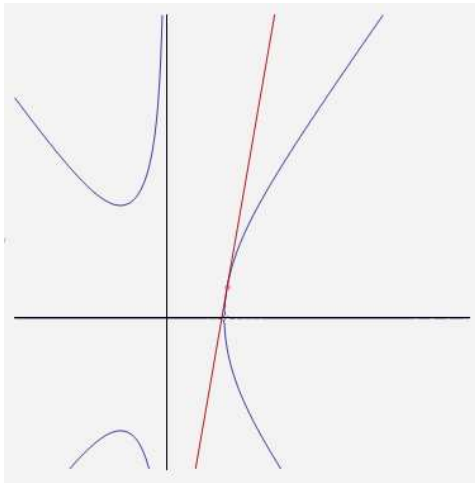
3. Solve the logarithmic equation $\log x + \log (x - 21) = 2$.

4. A company finds that x days after the conclusion of an advertising campaign the daily sales of a new product are $S(x) = 400 + 800e^{-0.2x}$.
   (a) What are the initial daily sales at launching time? (b) After how many days will the daily sales be at the level of 600 units?

5. Find an equation for the tangent line to the graph of $f(x) = x^2 \ln x$ at $x = e$.