EXAM 2 - MATH 111 Friday, February 28

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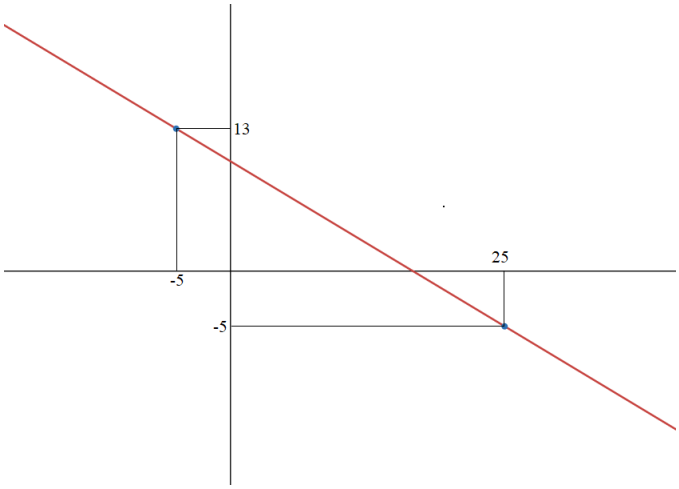
Read each problem **very carefully** before starting to solve it. Each problem is worth 10 points. It is necessary to show **all** your work. Correct answers without explanations are worth 0 points. GOOD LUCK!!

1. (a) Find a formula for the inverse function of $f(x) = 5 + \sqrt{3x+2}$.

(b) Find a formula for the inverse function of $f(x) = \dfrac{3x+1}{5x-2}$.

2. (a) Find an equation of the line passing through the point $(-3, -21)$ and perpendicular to the line with equation $63x + 7y = 14$.

(b) Find an equation for the graph shown in the figure.



3. Suppose the following table shows the population of bacteria in a Petri dish where a certain contaminant was unintentionally inserted.

Day t	3	9
Population	3500	2600

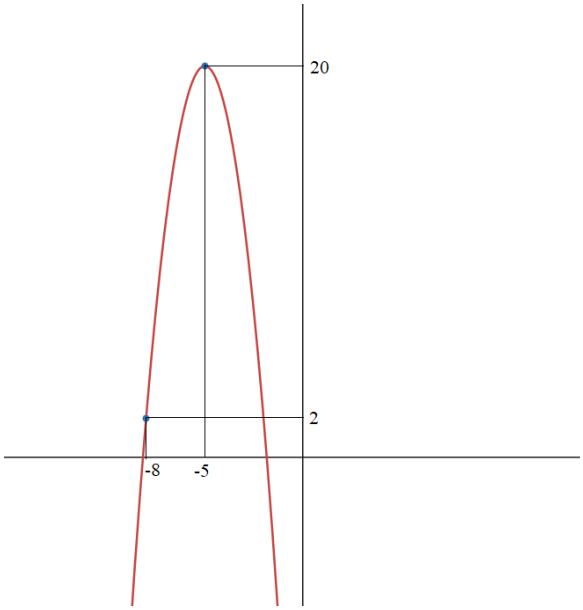
(a) Assuming a linear trend, find a model for the population $P(t)$ after day t. Please, do not shift time t.

(b) If the trend continues when will the bacteria in the dish become extinct?

4. (a) Consider the parabola $f(x) = -3x^2 + 36x + 5$.
Convert the equation in standard form showing all steps.

Use the standard form to find the range, providing all explanations.

(b) Find an equation for the parabola shown and leave your answer in general form.



5. Suppose that for a certain commodity, market research has revealed that, when the price p per unit is \$10.00, 30,000 units are sold, whereas when the price per unit rises to \$13.00 only 26,400 units are sold.

   (a) Write a linear equation for the quantity $Q(p)$ sold as a function of the price per unit.

   (b) Write an equation for the revenue $R(p)$ of the company producing the commodity as a function of the price p.

   (c) Help the company adjust the price per unit so as to maximize the company's revenue.