Are you ready for math 112?

1. Consider the linear equation: \(4x + 3y - 15 = 0\)
   a. Put the equation in slope intercept form
   b. State the slope
   c. State the coordinate of the y-intercept
   d. Give the exact coordinate for the x-intercept
   e. Graph the line

2. Find the equation of a line passing through points:
   (-5,4) & (5,8)

3. Consider the data in the chart concerning the weight of channel iron

<table>
<thead>
<tr>
<th>Channel iron lengths and weights chart</th>
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</thead>
<tbody>
<tr>
<td>Length (x)</td>
</tr>
<tr>
<td>Weight (y)</td>
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</table>

   a. Find a linear model for the relationship by hand using the longest and shortest lengths.
   b. Use the regression function in your calculator to find a linear model (equation) for the relationship between length (x) and weight (y).
   c. Use the regression equation to predict the weight of a 62 foot length of channel iron.
   d. Use the regression equation to predict the length of channel iron weighing 784 lbs.

4. Solve the equation: \(6.2(2x - 7) + 10.24 = 9 - 4(3x - 4.1)\)

5. Solve the equation: \(3x - 2 = \frac{2}{5} - \frac{5x - 2}{4}\)

6. Find the equation for the circle in standard form.

7. Change the equation of the circle to standard form: \(x^2 + y^2 - 8x + 14y + 29 = 0\)
8. Find the equation for the ellipse in standard form.

9. Find exact zeros for the function \( f(x) = x^3 - x^2 - 22x - 8 \)

10. Solve (rounded to 2 decimal places): \( 12 - 4\ln(x-3) = 5 \)

11. Calculate the interest rate necessary for $760 to grow to $980 in 4 years compounded continuously.
   Use the compound interest formula: \( A = Pe^{rt} \), where \( A \) = final amount, \( P \) = starting amount, \( r \) = interest rate, and \( t \) = time in years.

12. Solve the system by substitution: \( y = 2x^2 - 3x + 4 \)
   \[ 7x - y = 8 \]

13. A river flows at 384 cfs at 6:00 am, then at 786 cfs at 11:00 am. Use the exponential function:
   \( A = A_0e^{kt} \), where \( A \) = final amount, \( A_0 \) = initial amount, \( k \) = rate of change and \( t \) = time in hours. Find a function for \( A(t) \) and use it to find the time the river will reach 1200 cfs.

14. Solve the system by elimination:
   \[ -2x - 3y + 5z = 13 \]
   \[ 4x - 2y - 6z = 2 \]
   \[ 3x + 4y - z = 1 \]

Solutions:
1. a. \( y = -\frac{4}{3}x + 5 \)   b. \( -\frac{4}{3} \)   c. \((0,5)\)   d. \((3\frac{3}{4},0)\)   e. 

2. \( y = \frac{2}{5}x + 6 \)   3. a. \( y = 10.24x - 42.56 \)   b. \( y = 10.18x - 39.98 \)   c. 591 lbs. d. 81 feet   4. \( x = 2.4 \)   5. \( \frac{58}{85} \)

6. \( (x + 4)^2 + (y + 3)^2 = 49 \)   7. \( (x - 4)^2 + (y + 7)^2 = 36 \)   8. \( \frac{(x-6)^2}{49} + \frac{(y-2)^2}{81} = 1 \)   9. \( x = -4 \& \frac{5\pm\sqrt{33}}{2} \)
10. \( x \approx 8.75 \)   11. \( r \approx 6.4\% \)   12. \((2,6)\) \& \((3,13)\)   13. \( A(t) = 384e^{\frac{143t}{2}} \) \( t \approx 7.97 \) or 1:58 pm   14. \((4,-2,3)\)