**Exam 3 Topic List – Math 110 – Spring 2014**

If you think dogs can't count, try putting three dog biscuits in your pocket and then giving Fido only two of them.  ~Phil Pastoret

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| **Date covered in class** | **Topic** | **Learning Objective** |
| Feb 12 & 14 | Intro. to Exponential Equations | Be able to write the general form of an exponential equation and identify the parts of the equation. |
| From a table, be able to determine which functions are linear, which are exponential, and which are neither. Be able to justify your choice. |
| From a table, be able to write a linear and exponential equation. |
| Given a list of equations, be able to identify which equations represent a linear function, which equations represent an exponential function, and which are neither. |
| Given an exponential equation, be able to determine if the equation represents growth or decay. |
| Feb 19 | Writing exponential equations from two points | Given a verbal description with a calendar year such as 1995, be able to reinitialize the variable to read: years after 1995. |
| Explain why a linear function better models a relationship. |
| Explain why an exponential function better models a relationship. |
| Create an exponential equation from 2 points, one of which is the initial value. |
| Feb 21 | Exponential Equations - A constant % change | Create an exponential equation given the initial value and a rate in percentage form. |
| Given an exponential equation, be able to determine the rate as a percentage and interpret this value in the context of the situation. |
| Feb 24 | Visualizing exponential functions | Match equations with graphs of exponential functions (growth and decay). |
| Identify the end behavior for a given function. |
| Identify the asymptotes of a given function. |
| Identify and apply transformations to the equation or graph of an exponential function. |
| Feb 26 | Exponential Functions – Solving for Unknowns | For an exponential function: Given input, find output. |
| Feb 28 | Financial Formulas | Identify the parts of the financial formulas:$$y=P\_{0}\left(1+\frac{r}{n}\right)^{nt} OR y=P\_{0}e^{rt}$$ |
| Write the appropriate equation using the financial formulas:$$y=P\_{0}\left(1+\frac{r}{n}\right)^{nt} OR y=P\_{0}e^{rt}$$ |
| Mar 3 | Logarithms | Rewrite a logarithmic equation into exponential form and vice versa. |
| Be able to solve for a variable in the exponent using logarithms. |
| Mar 5 | Exponential and Log Review  | Be able to complete all questions on this set of notes. |
| Mar 7 | Linear, Exponential, and Logarithmic Functions | Be able to identify and/or interpret the characteristics of each family of functions (Linear, Exponential, and Logarithmic) including: intercepts, rates of change, asymptotes, end behavior, and domain and range. |
| Mar 12 | **Exam 3** |

**\*\*ALL EXAMS ARE CUMULATIVE\*\***

**Refer to the Exam 1 and Exam 2 topic lists on the following pages and review your past exams.**

**Exam 2 Topic List – Math 110 – Spring 2014**

 “Do not worry about your problems with mathematics, I assure you mine are far greater.”

-Albert Einstein

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| **Date covered in class** | **Topic** | **Learning Objective** |
| Feb 3 | Linear Systems | Given context, * define variables
* write a linear system
* solve a linear system (algebraically (substitution or elimination) and graphically) AND interpret the solution.
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| Feb 5  | **Exam 1** |
| Feb 7 | Linear Systems | Given system,* create context
* solve a linear system (algebraically (substitution or elimination)) AND interpret the solution.

Given context, * define variables
* write a linear system
* solve a linear system (algebraically (substitution or elimination)) AND interpret the solution.
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| Feb 10 | Linear Programming | Given context, * define variables
* write an equation for the objective function
* write a system of inequalities (constraints)
* graph the system of inequalities and shade the feasible region
* find all corner points (using substitution or elimination when needed)
* determine the combination needed to maximize or minimize the objective function and write a conclusion statement for the problem.
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| Feb 12 | Explain what the feasible region represents. |
| Explain what the corner points represent. |
| Feb 17 | **Exam 2** |

**\*\*ALL EXAMS ARE CUMULATIVE\*\***

**Refer to the Exam 1 topic list on the following page and review your first exam.**

**Exam 1 Topic List – Math 110 – Spring 2014**

“For the things of this world cannot be made known without a knowledge of mathematics” – Roger Bacon

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| **Date covered in class** | **Topic** | **Learning Objective** |
| Jan 13 | Ind/Dep Variables | Define independent and dependent variables (labeling with ind/dep, meaning, units, and letter) |
| Jan 15 | Definition of a function, Function Notation | Identify if a relationship is a function and justify with the definition of a function |
| Demonstrate proper use of function notation |
| Differentiate between the following statements: Evaluate f(0) and Solve f(x)=0 |
| Given input, find output AND interpret the results |
| Given output, find input AND interpret the results |
| Domain and Range | Given a table, graph, equation, or situation, be able to identify the domain and range |
| Be able to use either interval or inequality notation to define the domain and range |
| Jan 17 | Transformations (shifts and reflections) | Given an expression or a graph, be able to identify and apply transformations (horizontal & vertical shifts, reflections) |
| Jan 20 | Average Rate of Change, Linear Functions | Calculate AND interpret the average rate of change |
| Given a table, graph, equation, or situation, be able to identify if the function is a linear function AND justify your reasoning. |
| Jan 22 & Jan 24 | Linear Functions  | Given a verbal description with a calendar year such as 1990, be able to reinitialize the variable to read: years after 1990. |
| Given a linear function, identify AND interpret the slope and vertical intercept in the context of the problem |
| Differentiate between the vertical and horizontal intercept |
| Determine the horizontal intercept AND interpret it in the context of the situation |
| Write the equation of a linear function from a table, graph, or situation |
| Given an initial value and slope, write the equation for a linear function |
| Given any two points, be able to calculate the slope and the vertical intercept and then write the equation using this information (saucy soda factory question) |
| Domain and Range | Given a table, graph, equation, or situation, be able to identify the domain and range |
| Be able to use either interval or inequality notation to define the domain and range |
| Jan 27 & Jan 29 | Piecewise Functions | Write the equation for a piecewise function (from a table, graph, or situation) |
| Jan 31 | Pendulum Lab | Apply all concepts above to real data. Analyze data to determine if data can be represented by a linear function. |
| Feb 5 | **EXAM 1** |