EGR 120 Due Date: _____
Introduction to Engineering
File: N120H5M

Homework Assignment #5

(Microsoft Equation and Drawing Tools)

Reading Assignment:

Lecture #9 – Microsoft Equation and Drawing Tools
Access for Microsoft Word (including Drawing Tools and Equation Editor)

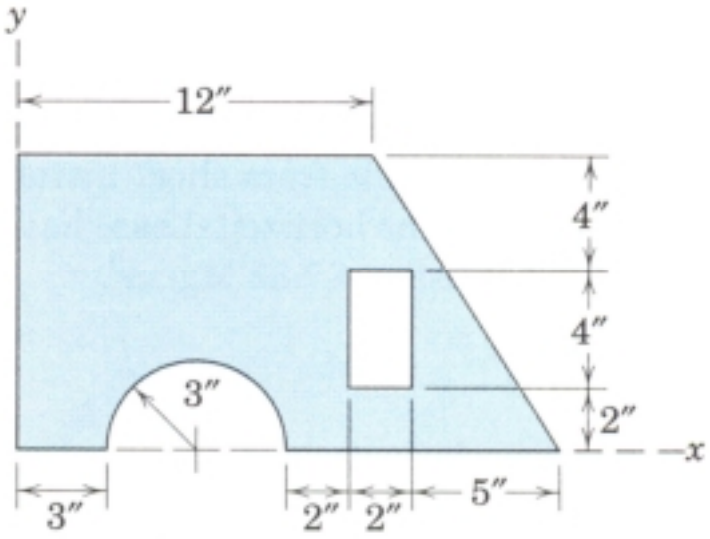
Problem Assignment:

1. (30 points) **Using the Equation Editor in Microsoft Word** (Figure 1):
   Suppose that you wanted to create a report that included equations along with the text. The Microsoft Equation Editor can be used to easily generate most equations that you would ever require. The Equation Editor is accessed by selecting ***Insert – Object – Microsoft Equation*** from the main menu in Word. Use Word and the Equation Editor to duplicate Figure 1.

2. (40 pts) **Using the Microsoft Drawing Tools to draw diagrams (Drawings 1-4):**
   Use Microsoft Word and the Microsoft Drawing Tools to generate the figures and text shown in Drawings 1-4.

3. (30 pts) **Computer solution to an engineering problem:**
   In EGR 140 students will commonly need to calculate the ***centroid*** (which is the same as the ***center of gravity*** for uniform material) of an object. One step in calculating the centroid is to find the total area of the object. Solve the problem below. The solution must be:
   - Done in Microsoft Word
   - Use Microsoft Equation for all equations
   - Follow the format in the example on page 10 of Lecture #9 (including the lines around the solution; Given, Find, and Solution sections; etc, but not the comments)
   - Use the Microsoft Drawing Tools to draw all figures.
   - If the object is divided into shapes in the problem below, include diagrams for each shape.

   Problem: Find the area of the figure shown below. Express the result in in^2, cm^2 and ft^2.



John Doe (use YOUR name)
EGR 120 – Homework #4
Introduction to Engineering

The following formulas were created using the Equation Editor in Microsoft Word.
The Equation Editor is accessed by selecting ***Insert – Object – Microsoft Equation*** from the main menu in Word.

$$Root1, Root2 = \frac{-b \pm \sqrt{b^2 - 4 \cdot a \cdot c}}{2 \cdot a}$$

$$\int u dv = uv - \int v du$$

$$\int_0^{\infty} 10e^{-2t} dt = -5e^{-2t}\Big|_0^{\infty} = -5(0-1) = 5$$

$$\cos(\alpha + \beta) = \sin(\alpha)\sin(\beta) + \cos(\alpha)\cos(\beta)$$

$$\begin{bmatrix} 1 & 2 & 4 \\ 5 & -2 & 6 \\ 0 & 1 & 7 \end{bmatrix} \begin{bmatrix} x \\ y \\ z \end{bmatrix} = \begin{bmatrix} 10 \\ 20 \\ 45 \end{bmatrix}$$

$$e^{\pm j\theta} = \cos(\theta) \pm j\sin(\theta)$$

$$\sum_{i=1}^{N} i = \frac{N(N+1)}{2}$$

$$\overline{A} \times (\overline{B} + \overline{C}) = (\overline{A} \times \overline{B}) + (\overline{A} \times \overline{C})$$

$$f(x) = \sqrt{1 + \frac{1}{\sqrt{1 + \frac{1}{\sqrt{x}}}}}$$

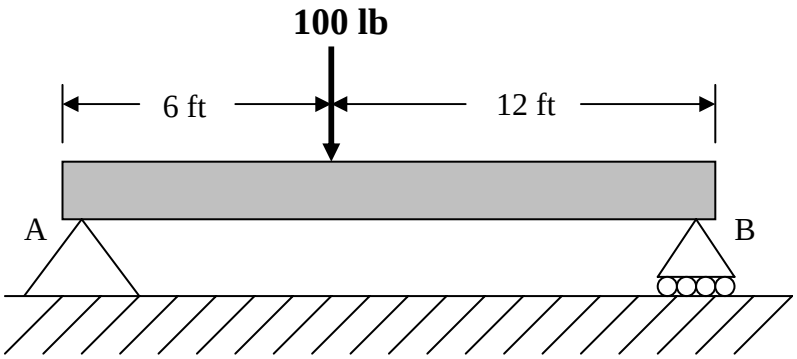
$$|A| \le |B| \le |C|$$

$$V_{BE} + V_{CB} = V_{CE}$$

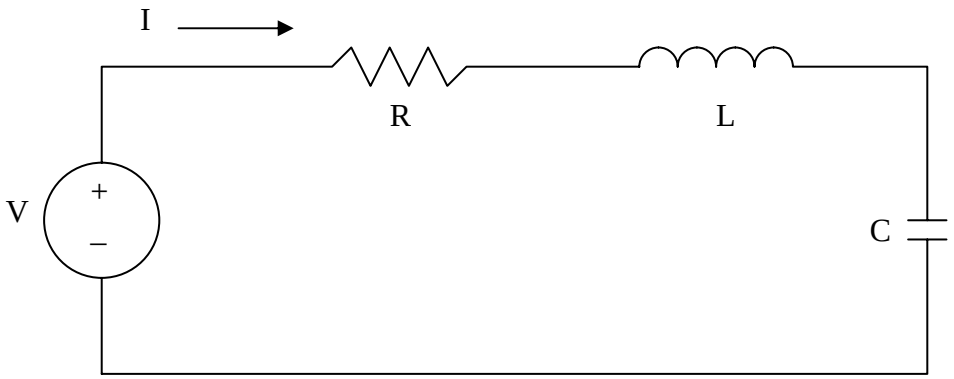
Figure 1

2) (40 points) Use the Drawing Tools within Microsoft Word to create Drawings 1-4 as shown or described below. Include all text (except the hints).

Name: (Use **YOUR** name)
Drawing 1 - Problem 1.11
Find the reactions at the beam supports A and B.

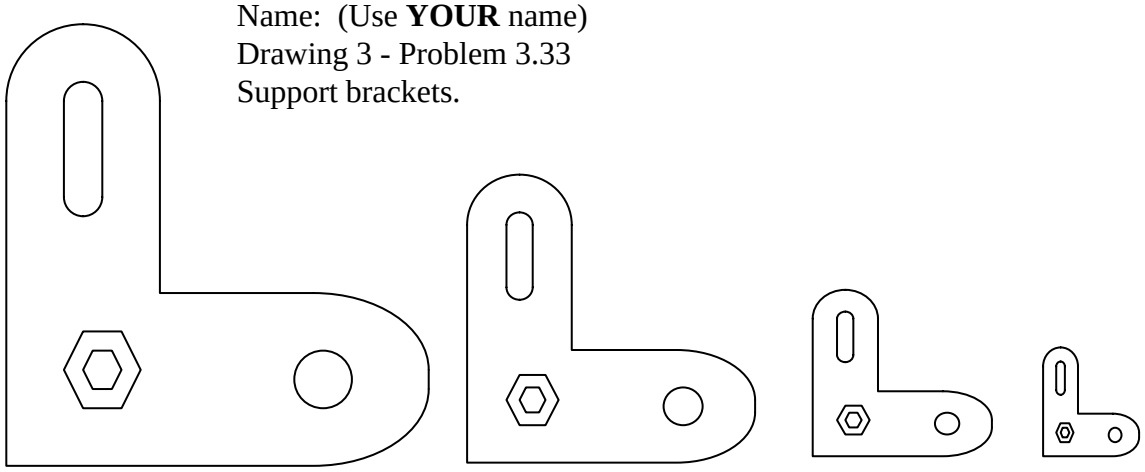


Name: (Use **YOUR** name)
Drawing 2 - Problem 2.22
Find the current I in the series RLC circuit shown below.



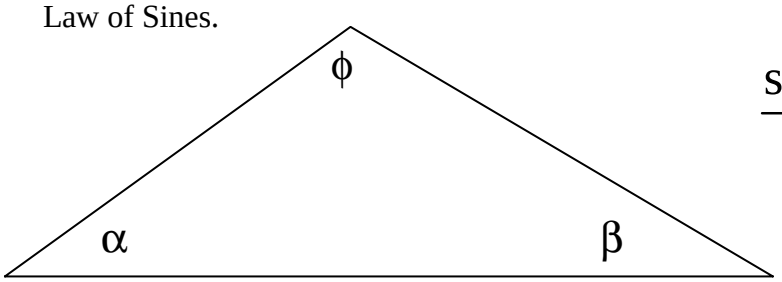
Hint: To form the symbol for the inductor (L) above, use the arc tool under AUTOSHAPES – BASIC SHAPES and then pick the symbol shown below:

Name: (Use **YOUR** name)
Drawing 3 - Problem 3.33
Support brackets.



Hint: Draw the object on the left and then GROUP it. Then copy it (three times) and resize the copies. The hex shape can be found under AUTOSHAPES – BASIC SHAPES.

Name: (Use **YOUR** name)
Drawing 4 - Problem 4.44
Law of Sines.



$$\frac{\sin(\alpha)}{A} = \frac{\sin(\beta)}{B} = \frac{\sin(\phi)}{C}$$

Hint: Use the Equation Editor to create the equation. Use text boxes in the Drawing Tools to create the Greek letters in the triangles by using the SYMBOL font (a = α, b = β, f = ϕ).
