Problem Set 1

Use Matlab to calculate the answers to the following:

Problem 1

a) $\frac{\sqrt{41^2-5.2^2}}{e^5-100.53}$

b) $\sqrt[3]{132}+\frac{ln(500)}{8}$

Problem 2

a) $cos(\frac{7\pi}{9})+tan(\frac{7}{15}\pi)sin(15°)$

b) $sin^2(80°)-\frac{(cos14°sin80°)^2}{\sqrt[3]{0.18}}$

Problem 3

Define the variables a, b, c, and d as:
$a=12, b=5.6, c=\frac{3a}{b^2}$, and $d=\frac{(a-b)^c}{c}$
then evaluate

a) $\frac{a}{b}+\frac{d-c}{d+c}-(d-b)^2$

b) $e^{\frac{d-c}{a-2^b}}+ln\left(\left|c-d+\frac{b}{a}\right|\right)$

Problem 4

Given $\int x\,sin\,ax\,dx=\frac{sin\,ax}{a^2}-\frac{x\,cos\,ax}{a}$

Calculate the following definite integral

$$\int_{\frac{\pi}{3}}^{\frac{3\pi}{2}} x\,sin(0.6x)dx$$

Problem 5

In the triangle shown in Figure 1, $a=5.3\,in.$, $\gamma=42°$, and $b=6\,in.$ Define a, γ, and b, as variables, and then:

a) Calculate the length b by using the Law of Cosines (Law of Cosines $c^2=a^2+b^2-2ab\,cos\gamma$)

b) Calculate the angles $\beta$and γ(in degrees) using the Law of Cosines

c) Check that the sum of the angles is 180°

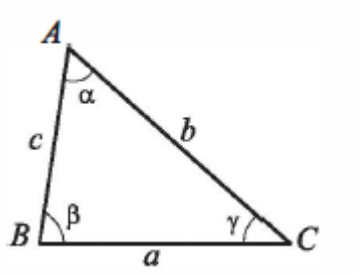

Figure 1: Problem 5 Diagram

Problem 6

In the triangle shown in Figure 2, $a = 5.0\,in.$, $\gamma = 25°$, and $b = 7\,in.$ Define a, γ, and b, as variables, and then:

a) Calculate the length c by using the Law of Cosines (Law of Cosines $c^2 = a^2 + b^2 - 2ab\,cos\gamma$)

b) Calculate the angles α and β(in degrees) using the Law of Sines

c) Verify the Law of Tangents by substituting the results from part(b) into the right and left sides of the equation. (Law of Tangents: $\frac{a-b}{a+b} = \frac{tan\left[\frac{1}{2}(\alpha-\beta)\right]}{\left[\frac{1}{2}(\alpha+\beta)\right]}$)

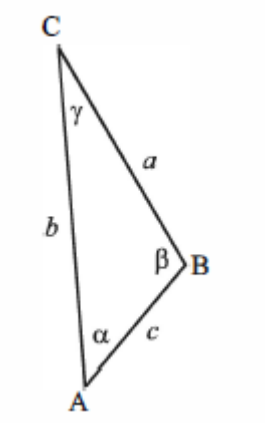

Figure 2: Problem 6 Diagram