Homework assignment - HW1

1.

Define the variables x and z as $x = 9.6$, and $z = 8.1$, then evaluate:

a) $xz^2 - \left(\frac{2z}{3x}\right)^{\frac{3}{5}}$

b) $\frac{443z}{2x^3} + \frac{e^{-xz}}{(x+z)}$

2.

Two trigonometric identities are given by:

a) $\sin 2x = 2\sin x \cos x$

b) $\cos\frac{x}{2} = \sqrt{\frac{1+\cos x}{2}}$

For each part, verify that the identity is correct by calculating each side of the equation, substituting $x = \frac{5}{24}\pi$.

3.

Two trigonometric identities are given by:

a) $\tan 2x = \frac{2\tan x}{1-\tan^2 x}$

b) $\tan\frac{x}{2} = \sqrt{\frac{1-\cos x}{1+\cos x}}$

For each part, verify that the identity is correct by calculating the values of the left and right sides of the equation, substituting $x = \frac{3}{17}\pi$.

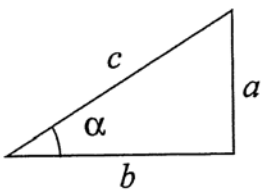
4.

Define two variables: *alpha* = 5π/9, *beta* = π/7. Using these variables, show that the following trigonometric identity is correct by calculating the value of the left and right sides of the equation.

$$\cos\alpha - \cos\beta = 2\sin\frac{1}{2}(\alpha+\beta)\sin\frac{1}{2}(\beta-\alpha)$$

5.

In the right triangle shown $a = 11$ cm, and $c = 21$ cm.
Define a and c as variables, and then:



a) Using the Pythagorean Theorem, calculate b by typing one line in the Command Window.

b) Using b from part *a*), and
tion, ulate the angle α in degrees, typing one line in the Command Window.

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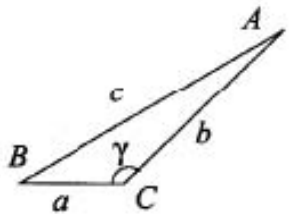
6.

In the triangle shown $a = 18$ cm, $b = 35$ cm, and $c = 50$ cm. Define a, b, and c as variables, and then calculate the angle γ (in degrees) by substituting the variables in the Law of Cosines.

(The Law of Cosines: $c^2 = a^2 + b^2 - 2ab\cos\gamma$)



7.

The distance d from a point (x_0, y_0) to a line $Ax + By + C = 0$ is given by:

$$d = \frac{|Ax_0 + By_0 + C|}{\sqrt{A^2 + B^2}}$$

Determine the distance of the point $(2, -3)$ from the line $3x + 5y - 6 = 0$. First define the variables A, B, C, x_0, and y_0, and then calculate d. (Use the `abs` and `sqrt` functions.)

8.

Flowers are packed in boxes such that a dozen are placed in each box. Determine how many boxes are needed to pack 751 flowers, using the `ceil` function.

9.

Define the following variables:

table_price = $256.95
chair_price = $89.99

Then change the display format to bank and:

a) Evaluate the cost of two tables and eight chairs.
b) The same as part *a*), but add 5.5% sale tax.
c) The same as part *b*) but round the total cost to the nearest dollar.

10.

When adding fractions, the smallest common denominator must be determined. For example, the smallest common denominator of 1/4 and 1/10 is 20. Use the MATLAB Help Window to find a MATLAB built-in function that determines the **least common multiple** of two numbers. Then use the function to show that the least common multiplier of:

a) 4 and 10 is 20.
b) 6 and 38 is 114.