

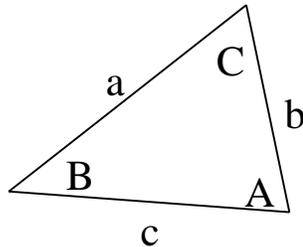
MATLAB Assignment #2

Reading Assignment:

MATLAB Lecture #2

MATLAB Assignment:

1. Write a MATLAB program where the user is prompted to enter a temperature in degrees Fahrenheit and the temperature is calculated in degrees Celsius, degrees Rankine, and Kelvin.
 - Include comments in your program, including name, course, filename, description of the assigned problem, and explanations of program features.
 - Display a description of the program
 - Prompt the user to enter the temperature in degrees Fahrenheit.
 - Nicely display the temperature in degrees Fahrenheit, degrees Celsius, degrees Rankine, and Kelvin using 1 digit after the decimal point.
 - Test the program for the following temperatures: 0 °F, 32 °F, 72 °F, and 212 °F.
 - Turn in a printout of the program and a printout of the output for the four cases above.
2. Write a MATLAB program to calculate the three angles in a triangle given the three sides using the law of cosines.



Law of Cosines

$$a^2 = b^2 + c^2 - 2 \cdot b \cdot c \cdot \cos(A)$$

Example :

If $a = 20$, $b = 15$, $c = 10$, then

$$20^2 = 15^2 + 10^2 - 2 \cdot (15) \cdot (10) \cdot \cos(A)$$

$$A = \cos^{-1} \left(\frac{15^2 + 10^2 - 20^2}{2 \cdot (15) \cdot (10)} \right)$$

$$A = 104.5^\circ$$

- Include comments in your program, including name, course, filename, description of the assigned problem, and explanations of program features.
- Display a description of the program
- Prompt the user to enter the three sides of the triangle.
- Display the three sides as well as the three angles in degrees (include the unit **degrees**). Use 1 digit after the decimal point for the sides and 2 digits after the decimal point for the angles.
- Test the program for the following cases:

Case	a	b	c
1	20	15	10
2	5	12	13
3	200	100	250

- Turn in a printout of the program and a printout of the output for the three cases above.

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3. Write a MATLAB program to solve N simultaneous equations.
- Include comments in your program, including name, course, filename, description of the assigned problem, and explanations of program features.
 - Display a description of the program.
 - Display an example so the user will know how to enter the inputs (using brackets, semicolons, etc).
 - Prompt the user to input matrices A and b.
 - Test the program with the following simultaneous equations:

Case	Equations
1	$x_1 + 4x_2 + 7x_3 = 10$ $2x_1 + 9x_2 - x_3 = 15$ $12x_2 + 6x_3 = 20$
2	$3x_1 + 4x_2 = 52$ $2x_1 - 3x_2 = -5$
3	$x_1 + 2x_2 + 3x_3 + 4x_4 + 5x_5 = 30$ $10x_1 + 11x_2 + 12x_3 = 40$ $21x_2 + 22x_3 + 23x_4 = 50$ $x_1 - x_2 + x_3 - x_4 + x_5 = 60$ $9x_1 + 8x_2 + 7x_3 + 6x_4 + 5x_5 = 70$

- Turn in a printout of the program and a printout of the output for the three cases above.
4. Write a MATLAB program to calculate the time that a cable car will require to travel the full length of the cable. See the example calculations provided in MATLAB Assignment #1.
- Include comments in your program, including name, course, filename, description of the assigned problem, and explanations of program features.
 - Display a description of the program.
 - Prompt the user to input:
 - a. The speed of the motor in rpm.
 - b. The diameter of the motor pulley in cm
 - c. The diameter of drive pulley in cm
 - d. The length of the cable in m
 - Compute the time to complete the course, based on the input values.
 - Display the four input values (with units) and the time to complete the course (in seconds using 1 digit after the decimal point).
 - Test the program for the following cases:

Case	Motor Speed (rpm)	Motor Pulley Diameter (cm)	Drive Pulley Diameter (cm)	Length of cable (m)	Time to complete course (seconds)
1	3000	1	6	50	
2	3000	1	3	50	
3	5000	1.5	6	50	
4	5000	1.5	3	50	