Mathematical Model

For Evaluation Robot.

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Math is the perfect science,
and practice makes perfect!

-Problem definition:

We are trying to write mathematical model to the evaluation robot arm to be sure about the safe and risk areas and locating the sensors places to guarantee the highest level of safety.

-Variables:

We thought the movement of the arm in 3D it will be x, y and z.

But if it in 2D it will be x and y.

-Operations:

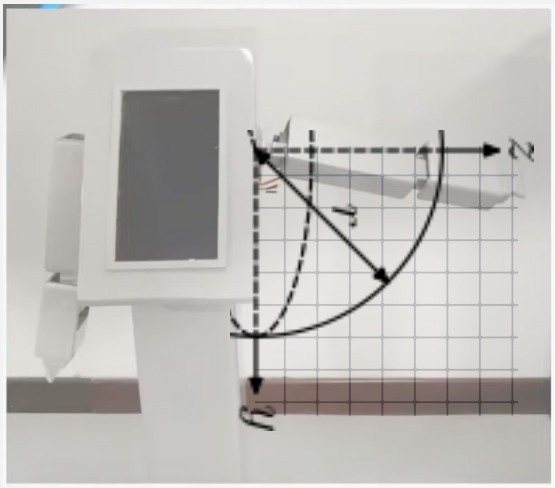
We decided to use: 1/8 ball volume law (V = (3/4) πr^3), where r is the radius) for 3D.

And the 1/4 circle area low (A =πr^2), where r is the radius) for 2D.

To make sure arm is moving from the allowed area.

-Implementation:

In 3D the allowed area is (1/8 * (3/4) π * 85^3) = 321555.0975 cm^3.



In 2D the allowed area is (1/4 * π * 85^2) = 1806.25 cm^2.