

Level 3

Translate--Rotate--Translate

Catalysts

Calculate the position and the direction of the rover after driving several segments (each with its distance and steering angle).

Input: WheelBase n {Distance SteeringAngle}
(n is an integer, all others are floating point numbers)

Output: x y NewDirection

(3 floating point numbers, rounded to two digits)

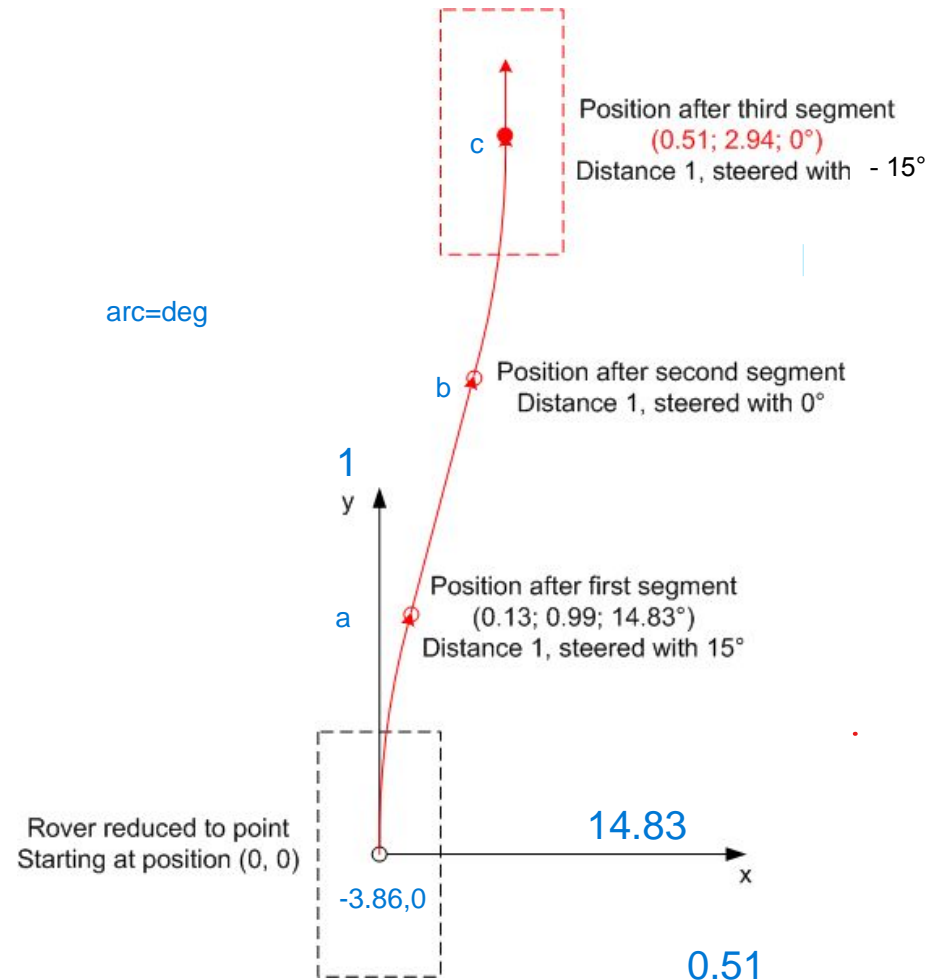
Example:

Input: 1.00 3 1.00 15.00 1.00 0.00 1.00 -15.00

Output: 0.51 2.94 0.00

For a hint on how to rotate a vector, see the following page.

There's also another example input, so read ahead.



Rotating a Vector

- A vector (x, y) can be rotated in the following way:

clockwise direction rotating

$$x' = \cos(a) * x + \sin(a) * y$$

$$y' = -\sin(a) * x + \cos(a) * y$$

<http://de.wikipedia.org/wiki/Drehmatrix>

http://en.wikipedia.org/wiki/Rotation_matrix

coordinate=distance of x-axis and distance y-axis from origin
and perpendicular to the origin

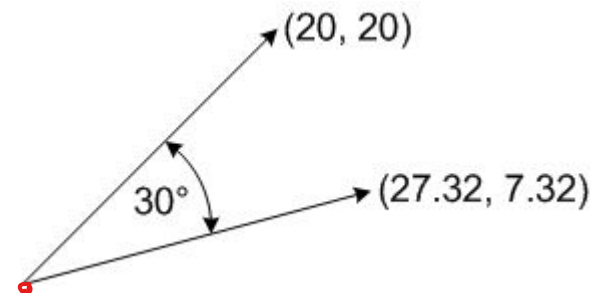
Example:

x: 20, y: 20

a: 30°

x': 27.32, y': 7.32

origin
radius



Level 3

Hint: Additional example for step by step testing - Driving a circle in 4 steps

Input: 1.09 4 9.86 10 9.86 10 9.86 10 9.86 10
Output: 0.00 0.00 0.00

Position after first move:	x = 6.28;	y= 6.28;	newDirection = 90.00;
Position after second move:	x = 12.55;	y= 0.00;	newDirection = 180.00;
Position after third move:	x = 6.28;	y= -6.28;	newDirection = 270.00;
Position after forth move:	x = 0.00;	y= 0.00;	newDirection = 0.00;

Consider that we rounded intermediate x,y and newDirection values to 2 digits for better reading. Maybe you calculate other values which are very close to our solution.

Angle is also used to refer to the measure of an angle or of an angle of rotation. This measure is conventionally defined as the ratio of the length of a circular arc to its radius, and may be signed. In the case of a geometric angle, the arc is centered at the vertex and delimited by the sides. In the case of a rotation, the arc is centered at the center of the rotation and delimited by any other point and its image by the rotation.