Level 3

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

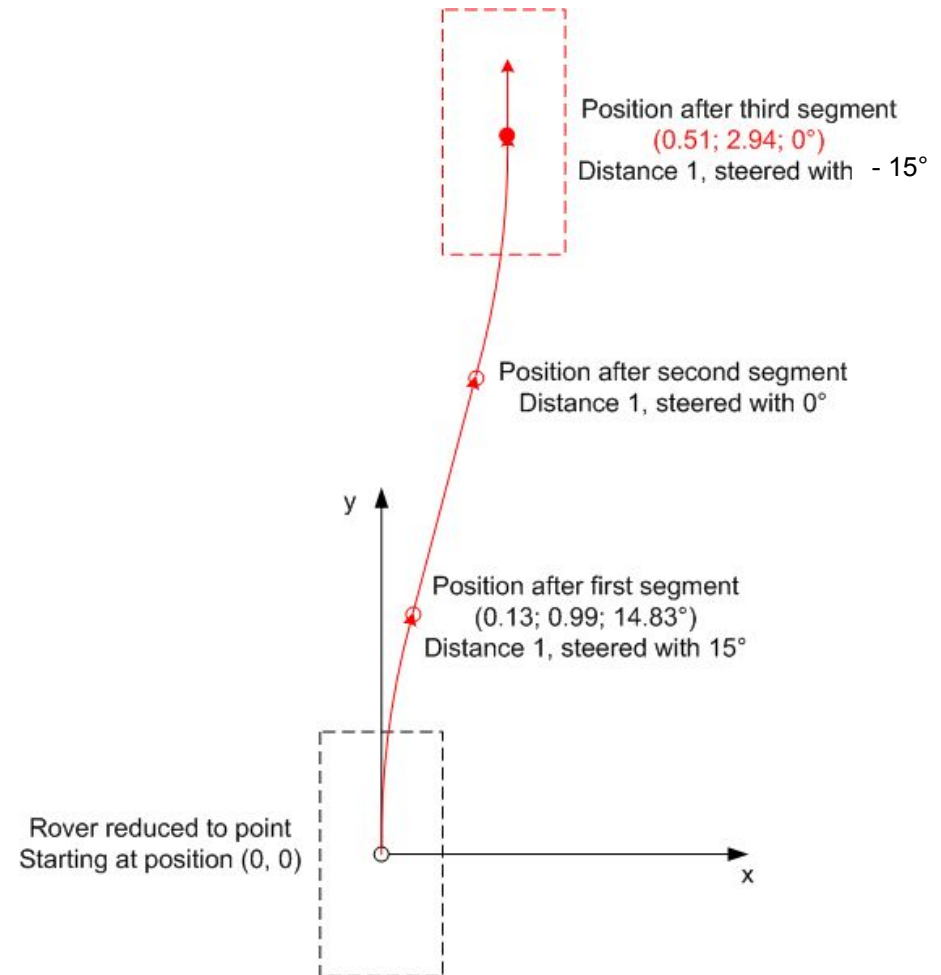(3 floating point numbers, rounded to two digits)

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.

Position after third segment
(0.51; 2.94; 0°)
Distance 1, steered with - 15°

Position after second segment
Distance 1, steered with 0°

y

Position after first segment
(0.13; 0.99; 14.83°)
Distance 1, steered with 15°

Rover reduced to point
Starting at position (0, 0)

x

Rotating a Vector

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

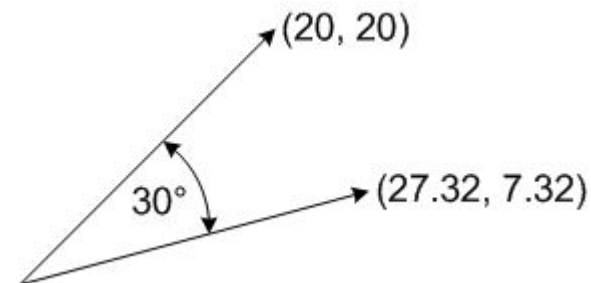 $$x' = \cos(a) * x + \sin(a) * y$$
  $$y' = -\sin(a) * x + \cos(a) * y$$

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

Example:

x: 20, y: 20

a: 30°

x': 27.32, y': 7.32

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.