Driving on Mars:
A Coding Problem

Curtis Brown
@cb_ltf
curtis@ti.com

Meet the TI-Innovator™ Rover

Rover Features

Front mounted ranger for measuring distance to obstacles

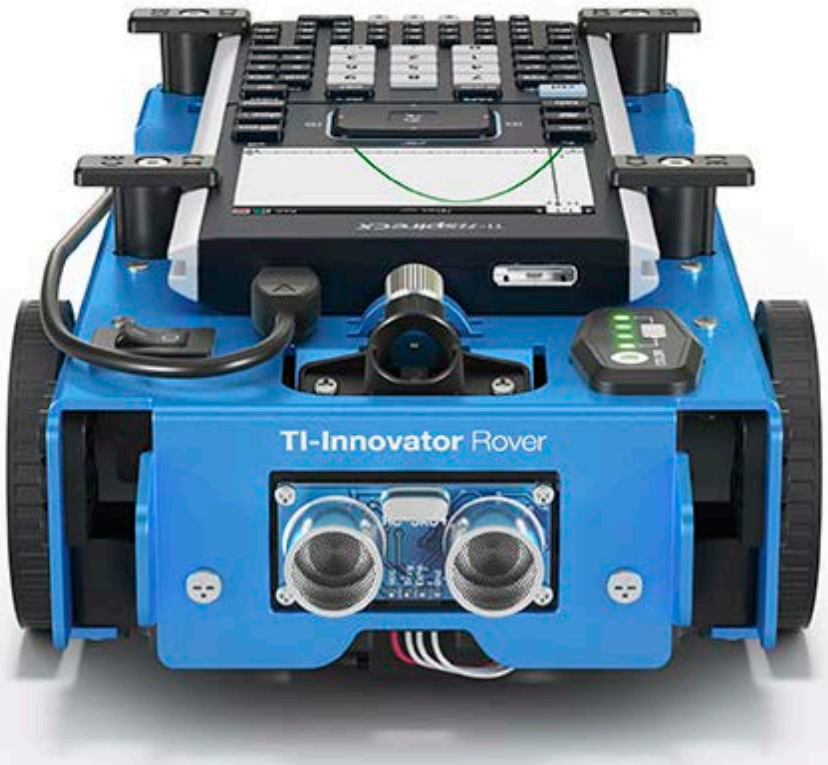
Marker holder for drawing paths on paper

Access to the six Grove Input and output connectors

High-capacity, rechargeable battery

Bottom mounted color sensor to measure RGB color

Additional Rover Features



- Two independently controllable motors
- High resolution motor shaft sensors to count revolutions
- Gyroscope to measure heading
- RGB LED on top to display programmable feedback to user

MAKE IT MOVE!

LEFT TURN PROGRAM

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Send("CONNECT RV")
Send("RV FORWARD 1")
Send("RV LEFT ")
Send("RV FORWARD 1")
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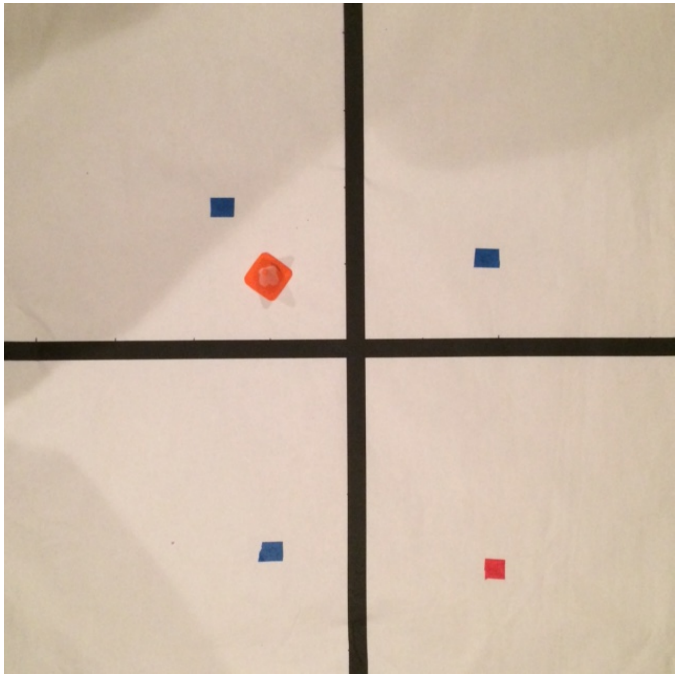
OTHER DRIVE COMMANDS:

RV TO XY

RV TO POLAR

Your challenge: Move the cone

- Beginning at the origin: circumnavigate the 3 blue “dots” then push the cone from the yellow dot to the red dot. Closest to the red dot wins!

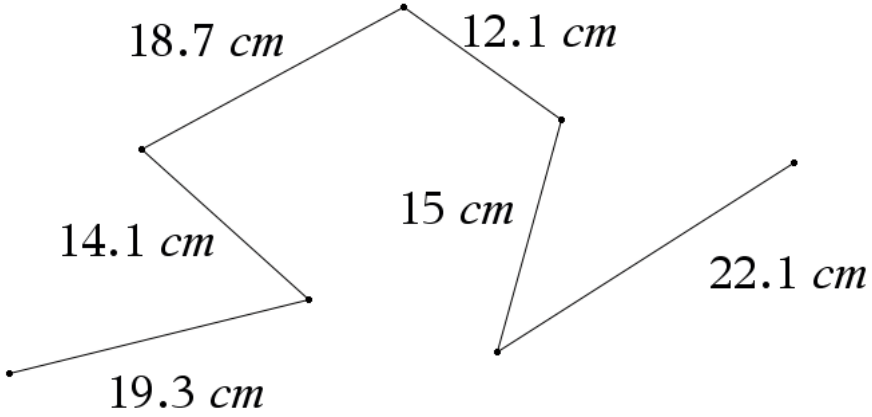


- Your starting code:
  - ClrHome
  - Disp "PRESS ENTER TO START"
  - Pause
  - Send("CONNECT RV")
  - Send("SET RV.GRID.M/UNIT 0.1")
  - Send("RV TO XY 0 0")

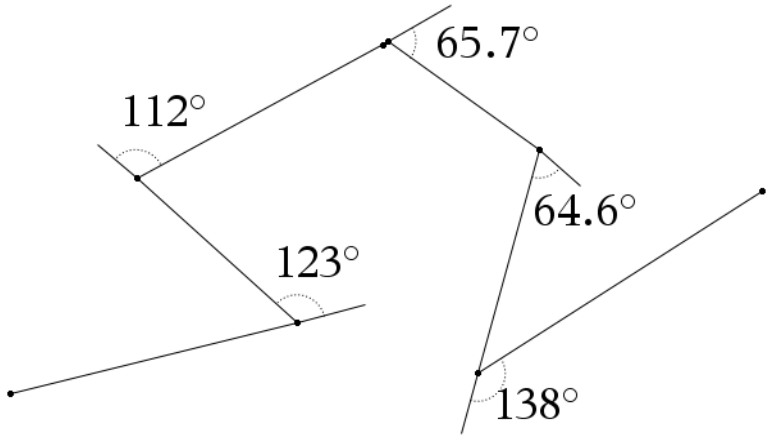
Math in Motion

- Premade CE/CX TI-Basic programs with a classroom usage guide
  - 2 programs (CE/CX) + 1 PDF = a “Math/Science in Motion” Activity
- Each Classroom “Usage Guide” (PDF) will
  - Provide a description of the program(s)
  - Describe possible subject areas and topics where the program(s) can be used
  - Contain sample questions teacher can pose to their students
  - Concise document; 1-2 pages

Math in Motion: Design a Path



Path with length measurements

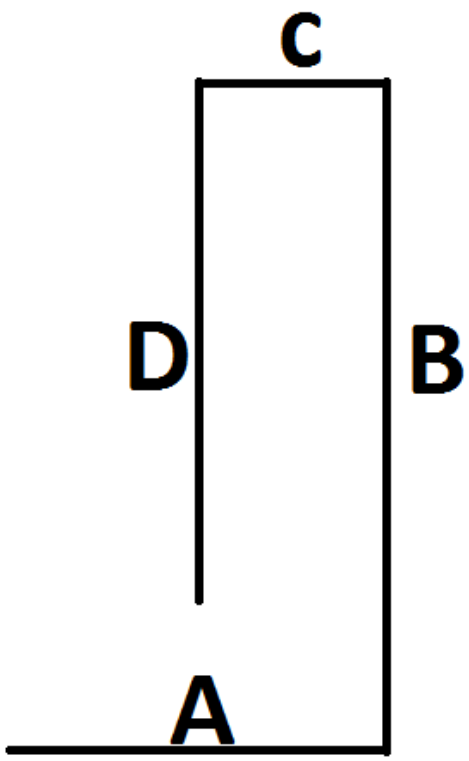


Path with angle measurements

Students will use the TI-Innovator™ Rover and the provided file to design and measure a segmented path. They will then verify their measurements and directions using Rover with the provided file.

Geometry/Pre-Algebra: metric Conversions; angle measurements; angle relationships

Math in Motion: Rover Rates



Students will use the TI-Innovator™ Rover and the provided files to explore the relationship between distance, rate and time. The students will relate their findings to the actions of Rover and understand they have the ability to apply this relationship to control how it drives a given path.

Algebra: linear relationships; distance, rate, and time

Math in Motion: Two Rovers Leave the Station

Students will use the TI-Innovator™ Rover and the provided file to help illustrate an intersection point of two lines. Students will crash two Rovers into each other. The crash will use the horizontal distance from the origin as the dependent variable and time as the independent variable. The velocity is the slope of the linear equation, and the starting distance from the origin is the y-intercept.

Algebra: systems of linear equations