



Problem of the Week

Problem B and Solution

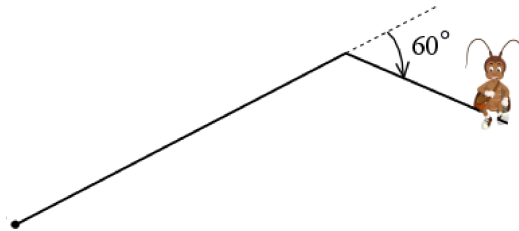
A Spritely Shape

Problem

Peyton used a block coding program to get a sprite character to draw a shape. His sprite followed these steps:

1. Put pen down to write
2. Move 10 steps forward
3. Turn clockwise 60°
4. Repeat steps 2 and 3 five more times

Here is the sprite's drawing partway through the program:

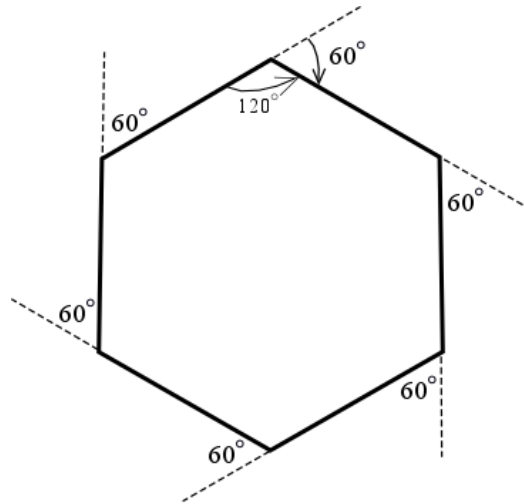


- (a) What type of polygon did the sprite draw?
- (b) What type of pattern did Peyton use in this code?
- (c) If the code were changed so that step 3 reads "Turn clockwise 45° ", how would Peyton need to change step 4 in order to create a closed polygon?



Solution

- (a) The sprite moved 10 steps forward and then turned 60° clockwise a total of six times. By doing this, the sprite created a regular hexagon (with interior angles of 120° , which sum to 720°). The completed hexagon is shown below.



- (b) Peyton used a *repeating* pattern in this code; continuing will retrace the hexagon.
- (c) If the code were changed so that step 3 reads “Turn clockwise 45° ”, Peyton would have to revise step 4 to “Repeat steps 2 and 3 seven more times.”, thus creating a regular octagon (with interior angles of 135° , which sum to 1080°). The completed octagon is shown below.

