THE STRIVING

MUSLIM ACADEMY

Islamic and Academic Education

STAGE 2 · COMPUTING · ALGORITHMS AND PROGRAMS

Algorithms and programs

Programs to read, to fix and to write, all of them on paper, because reading one before you run it is the whole skill.

WHAT IS INSIDE

- Where does the robot finish?
- Programs with a REPEAT
- Write the program
- How each one is worked

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3 sets · every answer worked line by line

Written for a parent teaching at home. No training assumed, and nothing else to buy.

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The instructions, and what they mean

This is the whole language. There is nothing else to remember.



EVERY INSTRUCTION

FORWARD 3	Move three squares the way you are facing.
RIGHT	Turn a quarter turn to the right. Do not move.
LEFT	Turn a quarter turn to the left. Do not move.
REPEAT 4 [...]	Do everything in the brackets four times.
SET score TO 0	Make a variable called score and put 0 in it.
ADD 5 TO score	Change what is in score by five.
IF score > 10 THEN ...	Do what comes after THEN, but only if score is more than 10.

An **algorithm** is the plan: the steps in order. A **program** is that plan written in a language a machine can follow. The same algorithm can be written as many different programs, which is why two correct answers to the same question can look nothing alike.

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Write the program

Draw the grid first.



1. **The robot starts at (0, 0) facing north. Write a program that finishes at (3, 3) facing east.**
   Go north first, then turn, then go east. Two FORWARDs and one turn is enough.

2. **The robot starts at (0, 0) facing north. Write a program that finishes at (4, 3) facing east.**
   Go north first, then turn, then go east. Two FORWARDs and one turn is enough.

3. **The robot starts at (0, 0) facing north. Write a program that finishes at (2, 3) facing east.**
   Go north first, then turn, then go east. Two FORWARDs and one turn is enough.

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How each one is worked

Every answer here was produced by running the program, not by reading it. Where a question asks you to write a program, the answer shown is one correct answer and not the only one.



WHERE DOES THE ROBOT FINISH?

1. The robot starts at (0, 0) facing north. Where does it finish?

1. After **FORWARD 2** the robot is at (0, 2) facing north.
2. After **LEFT** the robot is at (0, 2) facing west.
3. After **FORWARD 2** the robot is at (-2, 2) facing west.
4. So it finishes at **(-2, 2) facing west**.

Answer: **(-2, 2) facing west**

2. The robot starts at (0, 0) facing north. Where does it finish?

1. After **FORWARD 3** the robot is at (0, 3) facing north.
2. After **LEFT** the robot is at (0, 3) facing west.
3. After **FORWARD 1** the robot is at (-1, 3) facing west.
4. So it finishes at **(-1, 3) facing west**.

Answer: **(-1, 3) facing west**

3. The robot starts at (0, 0) facing north. Where does it finish?

1. After **FORWARD 1** the robot is at (0, 1) facing north.
2. After **LEFT** the robot is at (0, 1) facing west.
3. After **FORWARD 3** the robot is at (-3, 1) facing west.
4. So it finishes at **(-3, 1) facing west**.

Answer: **(-3, 1) facing west**

4. The robot starts at (0, 0) facing north. Where does it finish?

1. After **FORWARD 1** the robot is at (0, 1) facing north.
2. After **LEFT** the robot is at (0, 1) facing west.
3. After **FORWARD 1** the robot is at (-1, 1) facing west.
4. So it finishes at **(-1, 1) facing west**.

Answer: **(-1, 1) facing west**

5. The robot starts at (0, 0) facing north. Where does it finish?

1. After **FORWARD 1** the robot is at (0, 1) facing north.
2. After **LEFT** the robot is at (0, 1) facing west.
3. After **FORWARD 3** the robot is at (-3, 1) facing west.
4. So it finishes at **(-3, 1) facing west**.

Answer: **(-3, 1) facing west**

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SAMPLE PAGES

You have read a few pages. The pack is longer.

What you are holding is a short sample, taken from different parts of the pack so that you can see how a week is planned and what a child is actually asked to do, before you decide.

The complete pack, and the rest of the academic materials, are on our website: schemes of work for a parent teaching at home, and practice packs for the skills children get stuck on.

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Members of the homeschool community do not buy these. If you have joined the community, the pack for the term you are working on is given to you at no cost.

Our Islamic Education classes are free. These packs are part of what pays the teachers who teach them.