

Grade 8 · Introduction to Functions · Test Answer Key

Common Core 8.F.A.1, 8.F.A.2, 8.F.A.3 · mathovore.fr

Use this key to score the test out of 20 points. Each solution gives a model answer, and the scoring note explains how partial credit is awarded. Accept equivalent explanations in the student's own words, such as one output for every input, as long as the reasoning is correct.

Grade 8 Common Core: 8.F.A.1 · 8.F.A.2 · 8.F.A.3

Question 1: Mapping diagram (2 points)

Each input (2, 4 and 6) has exactly one output. Two inputs sharing the output 5 is allowed.

Yes, it is a function.

Scoring: 1 point for the correct answer; 1 point for a valid reason about one output per input.

Question 2: Table of values (2 points)

The input 3 has outputs 6 and 8.

No, it is not a function, because one input has two different outputs.

Scoring: 1 point for the answer; 1 point for naming input 3 with outputs 6 and 8.

Question 3: Evaluate (2 points)

$$f(-2) = -3(-2) + 5 = 11 \text{ and } f(4) = -3(4) + 5 = -7.$$

$$f(-2) = 11, f(4) = -7.$$

Scoring: 1 point for each correct value.

Question 4: Write an equation (2 points)

The outputs rise by 4, so $m = 4$. Then $4(1) + b = 5$ gives $b = 1$.

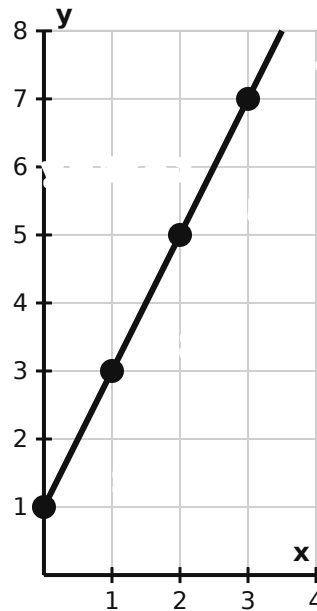
$$y = 4x + 1.$$

Scoring: 1 point for the rate 4; 1 point for the full equation.

Question 5: Points on a line (3 points)

- a. The points rise 2 for each 1 to the right, a constant change, so **it is linear**.
- b. The rate of change is **2**.
- c. The graph crosses the y-axis at 1: $y = 2x + 1$.

Scoring: 1 point per part.



The points lie on $y = 2x + 1$.

Question 6: Linear or nonlinear? (3 points)

- a. It has the form $y = mx + b$: **linear**.
- b. Sides 1, 2, 3 give areas 1, 4, 9; the change is not constant: **nonlinear**.
- c. The outputs rise by 3, 5, 7: **nonlinear**.

Scoring: 1 point per part.

Question 7: Compare two functions (2 points)

A: rate 5, initial value 2. B: rate $\frac{9-1}{2-0} = 4$, initial value 1.

A has the greater rate (5 versus 4) and the greater initial value (2 versus 1).

Scoring: 1 point for the rates compared; 1 point for the initial values compared.

Question 8: Taxi fare (2 points)

$f(7) = 2(7) + 3 = 17$, so the fare is **\$17**.

$2m+3=25$ gives $2m=22$ and $m=11$, so **11 miles**.

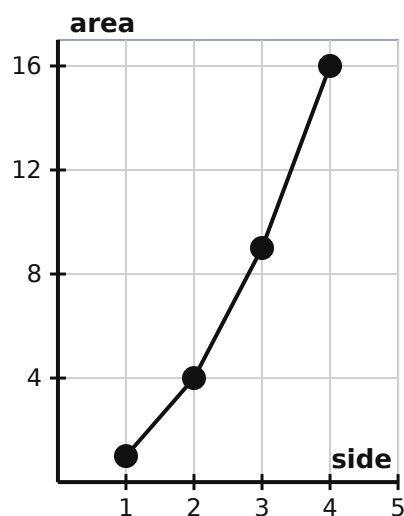
Scoring: 1 point for each answer.

Question 9: Area graph (2 points)

The areas 1, 4, 9, 16 increase by 3, 5 and 7, so the rate of change is not constant. The points do not lie on a line.

The function is nonlinear.

Scoring: 1 point for the answer; 1 point for a correct justification.



The segments get steeper.

Total
20 points