

Grade 8 · Linear Functions and Modeling · Quiz

Common Core 8.F.B.4, 8.F.B.5 · mathovore.fr

Name: _____ Date: ____/____/____ Score: _____

Ten multiple-choice questions check rate of change, initial value, writing $y = mx + b$ and reading graphs for standards 8.F.B.4 and 8.F.B.5. Choose one answer for each question, then read the explanation for any miss.

Grade 8 Common Core: 8.F.B.4 · 8.F.B.5

Questions

Question 1

What is the rate of change of the line through (1,2) and (5,10)?

- A. $\frac{1}{2}$
- B. 2
- C. 4
- D. 8

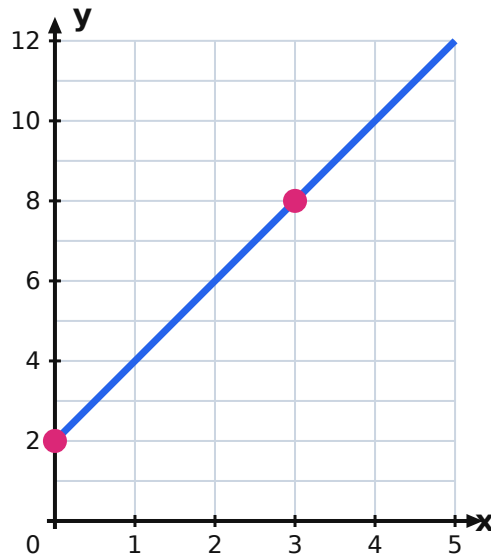
Question 2

What is the initial value of the function $y = 7x - 3$?

- A. 7
- B. -3
- C. 3
- D. $\frac{3}{7}$

Question 3

Which equation matches the line shown?



A line through $(0,2)$ and $(3,8)$.

- A. $y = 2x + 2$
- B. $y = 3x + 2$
- C. $y = 2x + 3$
- D. $y = \frac{1}{2}x + 2$

Question 4

The table shows a linear function. Which equation matches it?

x	0	1	2	3
y	10	7	4	1

- A. $y = 3x + 10$
- B. $y = 10x - 3$
- C. $y = -3x + 7$
- D. $y = -3x + 10$

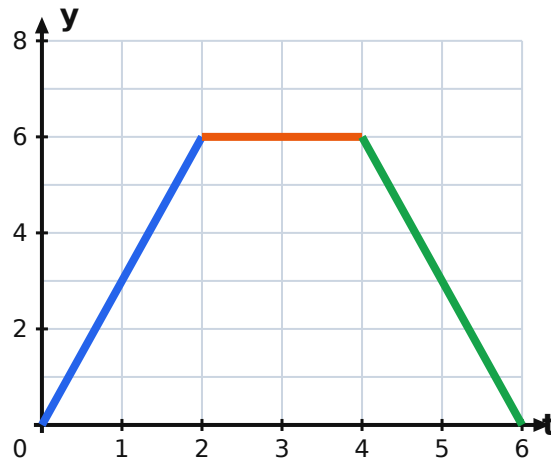
Question 5

A gym charges a sign-up fee plus per month. Which equation gives the total cost y after x months?

- A. $y = 20x + 15$
- B. $y = 15x + 20$
- C. $y = 35x$
- D. $y = 15x - 20$

Question 6

Which description fits the graph?



A graph in three parts.

- A. It falls, stays level, then rises.
- B. It rises steadily the whole time.
- C. It rises, stays level, then falls.
- D. It stays level, rises, then falls.

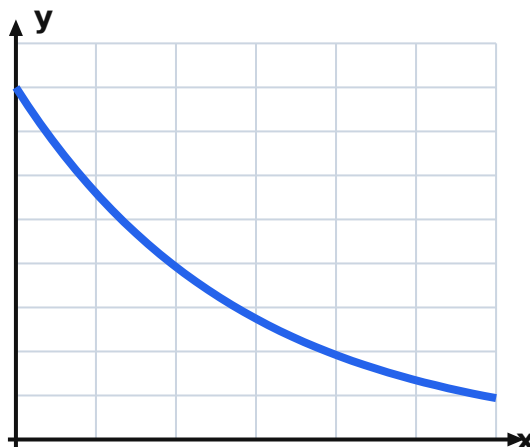
Question 7

Which table shows a linear function? Each list gives y -values for $x=1,2,3,4$.

- A. 2,4,8,16
- B. 1,4,9,16
- C. 3,5,9,15
- D. 5,9,13,17

Question 8

Which statement is true about the graph?



A curve that falls and flattens.

- A. Decreasing and linear
- B. Increasing and nonlinear
- C. Increasing and linear
- D. Decreasing and nonlinear

Question 9

A line has rate of change 3 and passes through (2,5). What is its equation?

- A. $y = 3x - 1$
- B. $y = 3x + 5$
- C. $y = 3x + 1$
- D. $y = 5x + 3$

Question 10

A plant is 4 inches tall and grows 1.5 inches per week. How tall is it after 6 weeks?

- A. 9 in
- B. 10 in
- C. 13 in
- D. 5.5 in

Answer key

1. **B** - The rate is the change in y over the change in x: 8 divided by 4 is 2. Using x over y gives $\frac{1}{2}$, a common mix-up.
2. **B** - The initial value is y when $x = 0$, which is $b = -3$. The number 7 is the rate of change.
3. **A** - The line crosses the y-axis at 2 and rises 6 for a run of 3, so the rate is 2. Swapping m and b gives $y = 2x + 3$.
4. **D** - The output drops 3 each step, so the rate is -3, and the value at $x = 0$ is 10. Ignoring the sign gives $y = 3x + 10$.
5. **B** - The fee is paid once (initial value 20) and is paid each month (rate 15). Swapping them gives $y = 20x + 15$.
6. **C** - Read the graph from left to right: up, flat, down. The other choices change the order or ignore a part.
7. **D** - Only 5, 9, 13, 17 has a constant change (+4). The others have changes that grow, so they are nonlinear.
8. **D** - The graph goes down from left to right, so it is decreasing. It is a curve, not a straight line, so it is nonlinear.
9. **A** - Substitute: $5 = 3(2) + b$, so $b = -1$. Using 5 for b ignores that the point is not on the y-axis.
10. **C** - Height = $4 + 1.5(6) = 13$. Forgetting the starting height gives 9.

Remember:

- A linear function has a constant rate of change, so its graph is a straight line.
- Rate of change: $m = (y_2 - y_1) / (x_2 - x_1)$. Initial value: b is the output when $x = 0$.
- In a story, m is the change per unit (dollars per hour) and b is the starting amount.
- A graph can be increasing, decreasing or constant, and linear or nonlinear.
- To sketch a graph from a story, steep means fast change and flat means no change.