

Algebra 1 · Building Functions and Inverses · Quiz

Common Core F-BF.A.1a, F-BF.A.1b, F-BF.B.4a, F-LE.A.1b · mathovore.fr

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

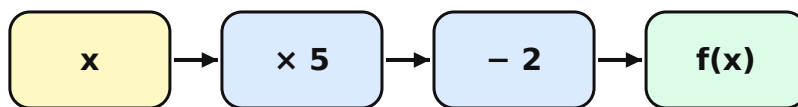
Answer these 10 multiple-choice questions on writing functions from situations, combining functions, inverses of linear functions and constant rates of change. Each question has exactly one correct answer. Check your choice by substituting values.

Algebra 1 Common Core: **F-BF.A.1a · F-BF.A.1b · F-BF.B.4a · F-LE.A.1b**

Questions

Question 1

The diagram shows the steps of a function. Which expression matches it?



Multiply by 5, then subtract 2.

- A. $f(x) = 5(x-2)$
- B. $f(x) = 5x-2$
- C. $f(x) = 5x+2$
- D. $f(x) = 5-2x$

Question 2

Revenue is $R(x) = 9x$ and cost is $C(x) = 4x + 75$. Which expression is the profit $P(x)$?

- A. $13x + 75$
- B. $5x + 75$
- C. $-5x + 75$
- D. $5x - 75$

Question 3

For $R(x)=9x$ and $C(x)=4x+75$, how many units give break-even?

- A. 75 units
- B. 15 units
- C. 18.75 units
- D. 8.33 units

Question 4

Let $f(x)=7x+2$ and $g(x)=3x-5$. What is $(f-g)(x)$?

- A. $4x+7$
- B. $4x-3$
- C. $10x-3$
- D. $-4x-7$

Question 5

Let $f(x)=4x+9$. Solve $f(x)=33$.

- A. $x=10.5$
- B. $x=6$
- C. $x=24$
- D. $x=8.25$

Question 6

Let $f(x)=3x-12$. Which expression gives x in terms of y ?

- A. $x=\frac{y-12}{3}$
- B. $x=3y+12$
- C. $x=\frac{y+12}{3}$
- D. $x=\frac{y}{3}-12$

Question 7

Which statement is true for the table?

x	0	2	4	6
y	3	9	15	21

Values of x and y.

- A. Linear; y rises by 6 for each 1 in x
- B. Not linear; y changes by different amounts
- C. Linear; y rises by 3 for each 1 in x
- D. Linear; y rises by 2 for each 1 in x

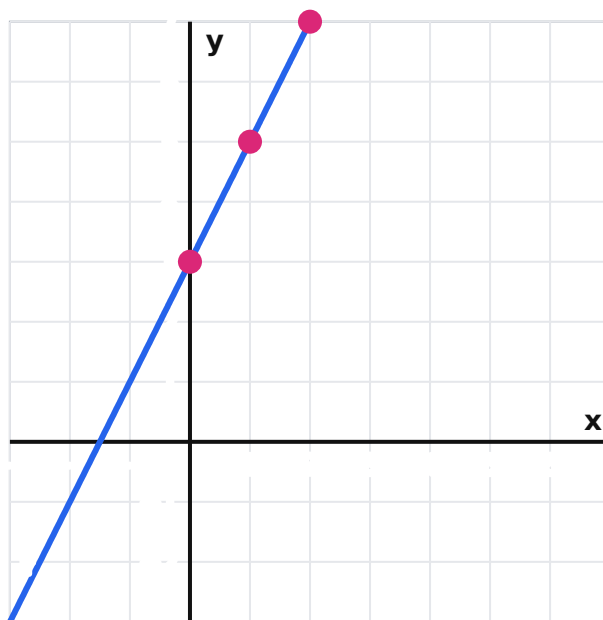
Question 8

A sequence has $a(0) = 20$ and $a(n) = a(n-1) + 7$. Which explicit rule matches it?

- A. $a(n) = 20n + 7$
- B. $a(n) = 7n + 140$
- C. $a(n) = 27n$
- D. $a(n) = 7n + 20$

Question 9

The point $(2, 7)$ is on the graph of f . Which point is on the graph of its inverse?



The graph of $f(x) = 2x + 3$.

- A. $(2, 7)$

- B. $(-2, -7)$
- C. $(7, 2)$
- D. $(7, -2)$

Question 10

A skate park charges to enter plus per hour, so $T(h) = 3h + 5$. Aisha paid . How many hours did she skate?

- A. 6 hours
- B. 9.33 hours
- C. 2.67 hours
- D. 18 hours

Answer key

1. **B** - Multiply x by 5 first, then subtract 2: $5x-2$. Writing $5(x-2)$ wrongly subtracts first.
2. **D** - $P = R - C = 9x - (4x + 75) = 5x - 75$. Forgetting to subtract the fixed cost gives $5x + 75$, and reversing the order gives $-5x + 75$.
3. **B** - Set $9x = 4x + 75$, so $5x = 75$ and $x = 15$. Dividing 75 by only one coefficient gives 18.75 or 8.33.
4. **A** - $7x + 2 - (3x - 5) = 7x + 2 - 3x + 5 = 4x + 7$. Not distributing the minus sign gives $4x - 3$.
5. **B** - $4x = 33 - 9 = 24$, so $x = 6$. Adding 9 instead of subtracting gives 10.5.
6. **C** - From $y = 3x - 12$ add 12 to get $y + 12 = 3x$, then divide everything by 3. Subtracting 12 repeats the original sign.
7. **C** - The x-step is 2 and the y-step is 6 every time, so the rate is $\frac{6}{2} = 3$ per unit. Reporting 6 forgets that x moves by 2.
8. **D** - It starts at 20 and adds 7 a total of n times: $7n + 20$. Swapping the start value and the step gives $20n + 7$.
9. **C** - The inverse swaps the coordinates: (a, b) becomes (b, a) . A point stays the same only if it is on the line $y = x$.
10. **A** - $3h + 5 = 23$ gives $3h = 18$ and $h = 6$. Adding the entry fee instead of subtracting gives 9.33 hours, and 18 is the money left after the fee, not the time.

Remember:

- Standards F-BF.A.1a, F-BF.A.1b, F-BF.B.4a and F-LE.A.1b: write functions from contexts, combine them, find simple inverses and spot constant rates.
- Explicit $f(h) = 8h + 12$ and recursive $f(0) = 12$, $f(h) = f(h-1) + 8$ describe the same situation.
- Profit equals revenue minus cost: $P(x) = R(x) - C(x)$; break-even is where $P(x) = 0$.
- To invert $y = 2x + 3$, solve for x : $x = \frac{y-3}{2}$.
- A constant rate of change means equal input steps give equal output changes.