

Brett Robbins Academic Consulting

# Mathematics 10C Practice Test

## Unit 4: Relations and Functions

25 Questions

Original practice questions written to the Alberta curriculum, in the style of past diploma examinations. Work through each question, then check your answers with the key at the end.

**This practice test was made by AI and there may be mistakes. If a question or answer looks wrong, contact Brett for clarification.**

Question 1

Which set of ordered pairs represents a function?

- A)  $\{(2, 5), (3, 5), (4, 5), (5, 5)\}$
- B)  $\{(1, 3), (1, 4), (2, 6), (3, 8)\}$
- C)  $\{(0, 1), (0, 2), (0, 3), (0, 4)\}$
- D)  $\{(-2, 7), (-2, -7), (3, 7), (4, 7)\}$

Question 2

The domain of the relation  $\{(-3, 4), (0, -1), (2, 4), (5, 7)\}$  is

- A)  $\{-1, 4, 7\}$
- B)  $\{-3, -1, 0, 2\}$
- C)  $\{-3, 0, 2, 4, 5\}$
- D)  $\{-3, 0, 2, 5\}$

Question 3

The range of the relation  $\{(1, -2), (3, 0), (3, 5), (6, -2)\}$  is

- A)  $\{1, 3, 6\}$
- B)  $\{-2, 0, 3, 5\}$
- C)  $\{-2, 0, 5\}$
- D)  $\{0, 5, 6\}$

Question 4

If  $f(x) = 3x - 5$ , then  $f(4)$  is

- A) 2
- B) 12
- C) 17
- D) 7

Question 5

The vertical line test states that a graph represents a function if every vertical line drawn on the graph intersects the graph

- A) At most once
- B) Exactly once
- C) At least once
- D) More than once

Question 6

If  $f(x) = x^2 - 3x + 1$ , then the value of  $f(-2)$  is \_\_\_\_

Question 7

A mapping diagram shows  $1 \rightarrow 4$ ,  $2 \rightarrow 4$ ,  $3 \rightarrow 7$ , and  $4 \rightarrow 9$ .

This relation is a function because

- A) Each output has exactly one input
- B) Each input has exactly one output
- C) No output value is repeated
- D) Every input and output is different

Question 8

The graph of a function is a line segment with endpoints  $(-2, 3)$  and  $(4, -1)$ .

The domain of the function is

- A)  $-2 \leq x \leq 4$
- B)  $-1 \leq y \leq 3$
- C)  $-2 < x < 4$
- D)  $-1 < y < 3$

Question 9

A graph shows the distance,  $d$  km, that a cyclist is from home over time,  $t$  h.

The graph rises steadily from  $(0, 0)$  to  $(2, 30)$ , is horizontal from  $(2, 30)$

to  $(3, 30)$ , then falls steadily back to  $(5, 0)$ . The cyclist was stopped

during the interval

A) from 0 h to 2 h

B) from 3 h to 5 h

C) The cyclist was never stopped

D) from 2 h to 3 h

Question 10

If  $f(x) = 2x + 7$  and  $f(x) = 19$ , then the value of  $x$  is \_\_\_\_\_

Question 11

Which of the following relations is NOT a function?

A)  $x = 3$

B)  $y = 2x + 1$

C)  $\{(-1, 2), (0, 2), (1, 2), (2, 2)\}$

D)  $y = x^2 - 3$

Question 12

Which statement is true about the relation

$\{(-4, 1), (-1, 3), (0, 3), (2, -2), (4, 0)\}$ ?

- A) It is not a function because the output 3 is repeated
- B) Its range is  $\{-2, 0, 1, 3\}$
- C) Its domain is  $\{-2, 0, 1, 3\}$
- D) It is not a function because  $-1$  and  $0$  have the same output

Question 13

If  $g(x) = x^2 - 4x$ , then the value of  $g(-3)$  is \_\_\_\_\_

Question 14

A graph shows the volume of water in a tank,  $V$  litres, over time,  $t$  minutes, as the tank drains. The graph is a straight line from  $(0, 120)$  to  $(15, 0)$ .

The  $x$ -intercept of the graph represents

- A) The initial volume of water in the tank
- B) The rate at which the water drains
- C) The time when the tank is empty
- D) The time when the tank is full

Question 15

If  $f(x) = 5 - 2x$ , then the value of  $f(-1) - f(2)$  is

- A) 4
- B) 8
- C) 6
- D)  $-6$

Question 16

A relation has domain  $\{-2, -1, 0, 1, 2\}$  and is defined by  $y = x^2$ .

The number of distinct values in the range of the relation is \_\_\_\_

Question 17

A taxi fare depends on the distance travelled. In this relation, the independent variable is

- A) The fare charged
- B) The distance travelled
- C) The taxi driver
- D) The time of day

Question 18

Which situation is best represented by a discrete graph?

- A) The number of concert tickets sold each day
- B) The temperature outside throughout a day
- C) The height of a plant as it grows over several weeks
- D) The volume of water in a pool as it fills

Question 19

If  $h(x) = 3(x - 2)$  and  $h(x) = 15$ , then the value of  $x$  is \_\_\_\_

Question 20

The graph of a function passes through the points  $(-3, 0)$ ,  $(0, -4)$ , and  $(2, 0)$ .

The  $y$ -intercept of the graph is

- A)  $-3$
- B)  $2$
- C)  $0$
- D)  $-4$

Question 21

For the function  $f(x) = \frac{x-6}{3}$ , the value of  $f(15)$  is

- A)  $9$
- B)  $5$
- C)  $7$
- D)  $3$

Question 22

The function  $f$  is defined by the set of ordered pairs

$\{(1, 2), (2, 4), (3, 8), (4, 16)\}$ . The sum of the values in the range of  $f$  is \_\_\_\_

Question 23

Which graph represents a function?

- A) A circle
- B) A parabola that opens upward
- C) A vertical line
- D) A parabola that opens to the right

Question 24

For a function  $f$ , it is known that  $f(5) = 9$ . Which statement is true?

- A) When the input is 9, the output is 5
- B) The domain of  $f$  is 5 and the range of  $f$  is 9
- C) The point (5, 9) lies on the graph of  $f$
- D) The value 5 is multiplied by  $f$  to give 9

Question 25

If  $f(x) = 2x^2 - 1$ , then the value of  $f(3) - f(1)$  is \_\_\_\_\_

# Answer Key

|       |        |        |
|-------|--------|--------|
| 1. A  | 10. 6  | 19. 7  |
| 2. D  | 11. A  | 20. D  |
| 3. C  | 12. B  | 21. D  |
| 4. D  | 13. 21 | 22. 30 |
| 5. A  | 14. C  | 23. B  |
| 6. 11 | 15. C  | 24. C  |
| 7. B  | 16. 3  | 25. 16 |
| 8. A  | 17. B  |        |
| 9. D  | 18. A  |        |

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