Function notation: 10 practice questions

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Name: _____ Date: _____

Attempt all questions and show your working. Suggested time: 15 to 20 minutes.

Section A: Consolidating (Questions 1-4)

Question 1

Let f(x) = 3x - 5. Find:

(a) f(0)

(b) f(4)

(c) f(-2)

Question 2

Let g(x) = x^2 + 2x. Find:

(a) g(3)

(b) g(-1)

(c) g(½)

Question 3

Let f(x) = 2x + 7.

(a) Solve f(x) = 19.

(b) Solve f(x) = 0.

Question 4

A plumber charges a call-out fee plus an hourly rate. The total charge in dollars for a job lasting h hours is C(h) = 90h + 60.

(a) State the independent variable and the dependent variable.

(b) Find C(3) and explain what it means.

Section B: Standard (Questions 5-10)

Question 5

Let f(x) = x^2 - 4x + 1. Find and simplify:

(a) $f(a)$

(b) $f(x + 1)$

(c) $f(2k)$

Question 6

A taxi fare in dollars for a trip of d km is given by $F(d) = 2.4d + 4.5$.

(a) Find $F(10)$.

(b) Explain in words what $F(15) = 40.5$ means.

(c) Solve $F(d) = 52.5$ and explain what your answer means.

(d) What do the numbers 4.5 and 2.4 represent in this model?

Question 7

(a) Find the range of $f(x) = 2x + 1$ when its domain is $\{-1, 0, 1, 2\}$.

(b) Find the range of $g(x) = x^2$ when its domain is $-3 \le x \le 2$.

(c) Which value of x cannot be in the domain of $h(x) = (1)/(x - 3)$? Explain why.

(d) State the largest possible domain of $k(x) = \sqrt{(x - 5)}$.

Question 8

State whether each relation is a function. Give a reason for each answer.

(a) $\{(1, 2), (2, 3), (3, 2)\}$

(b) $\{(1, 2), (1, 5), (2, 3)\}$

(c) $x^2 + y^2 = 25$

(d) $y = x^2$

Question 9

A hiker leaves her car and goes on a walk. The function $d(t)$ gives her distance from the car, in km, t hours after she starts walking. Explain in words what each statement means.

(a) $d(2) = 7$

(b) $d(t) = 0$ when $t = 0$ and when $t = 5$

(c) $d(3) > d(4)$

Question 10

The function $F(C) = 1.8C + 32$ converts a temperature of C degrees Celsius into degrees Fahrenheit. Copy and complete the table.

C	-10	0	25	□
F(C)	□	□	□	212

Function notation: answers

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Question 1

Answer: (a) -5 (b) 7 (c) -11

Question 2

Answer: (a) 15 (b) -1 (c) 5/4 (also accept 1.25)

Question 3

Answer: (a) $x = 6$ (b) $x = -7/2$ (also accept -3.5)

Question 4

Answer: (a) Independent: h (hours worked). Dependent: C (total charge), because the charge depends on the time (b) C(3) = 330: a 3 hour job costs $330

Question 5

Answer: (a) $a^2 - 4a + 1$ (b) $x^2 - 2x - 2$ ($(x + 1)^2 - 4(x + 1) + 1$) (c) $4k^2 - 8k + 1$

Question 6

Answer: (a) 28.5, so $28.50 (b) A 15 km trip costs $40.50 (c) d = 20: a fare of $52.50 is for a 20 km trip (d) $4.50 is the fixed starting charge (flag fall) and $2.40 is the charge per km

Question 7

Answer: (a) {-1, 1, 3, 5} (b) $0 \leq y \leq 9$ (c) $x = 3$, because it makes the denominator zero (d) $x \geq 5$

Question 8

Answer: (a) Function: each x value has only one y value (b) Not a function: $x = 1$ has two y values (c) Not a function: for example $x = 0$ gives $y = 5$ and $y = -5$ (a circle fails the vertical line test) (d) Function: each x gives exactly one y

Question 9

Answer: (a) 2 hours after starting she is 7 km from her car (b) She is at her car when she starts and again 5 hours later, when she gets back (c) She is closer to the car at 4 hours than at 3 hours, so overall she moved back towards the car between those times

Question 10

Answer: F(-10) = 14, F(0) = 32, F(25) = 77; the missing C value is 100