

Math 10 Enriched  
Ch1 Review Functions

Name \_\_\_\_\_

Date \_\_\_\_\_

1. If  $f(y) = y^2 - 1$  and  $g(y) = y + 1$ , find  $\frac{f(6)}{g(6)}$ .

2. The total resistance in a certain circuit wired in parallel is a function,  $g$ , of the resistances,  $a$  and  $b$ , where

$$g(a, b) = \frac{1}{\frac{1}{a} + \frac{1}{b}}.$$

Evaluate  $g(4, 5)$  and express your answer as a mixed number.

3. If  $f(x) = 2x + 1$  and  $g(x) = 3x - 5$ , find  $f(g(2))$ .

4. If  $k(x) = ((x + 1)x - 3)x + 2$ , find  $k(4)$ .

5. A table of values describing a linear function is:

$x$	$f(x)$
3	5
5	9
7	13
9	17

What is  $f(x)$  when  $x = 6$ ?

6. If ordered pairs of the form  $(x, x^3)$  belong to the function  $f$ , find the second coordinate of the pair  $(2\frac{1}{2}, y)$ . Express your answer as a mixed number.
7. If  $g(x) = 2x - 4$  and  $h(x) = \frac{1}{2}x + 2$ , find  $h(g(10)) - g(h(10))$ .
8. If  $f(x) = x + 2$ ,  $g(x) = 2x$ , and  $h(x) = x^2$ , find  $h(g(f(1)))$ .
9. If  $f(x) = 3x^2 + 2x - k$  find the value(s) of  $k$  for which  $f(2) = 6$ .

10. If  $f(x) = 4$  and  $g(x) = f^{-1}(x)$ , find  $f(g(f(x)))$ .

11. If  $f(x) = x^2 + 3$  and  $g(x) = |3x + 4|$ , find  $f(g(-2)) + g(f(-2))$ .

12. The function  $f(x)$  is defined as:

$$f(x) = \begin{cases} x - 2 & \text{for } x \leq 5, \\ x + 1 & \text{for } x > 5 \end{cases}$$

Find  $f(3) + f(5) + f(7)$ .

13. A function  $f$  is defined as follows:  $f(x) = \frac{1}{x}$  if  $x \geq 3$  and  $f(x) = \frac{8}{x}$  if  $x < 3$ . Find  $f(f(f(2)))$ .

14. A function is defined by  $f(0) = 1$  and  $f(n) = f(n - 1) + n + 1$ . Find  $f(5)$ .

15. Given that  $f(x) = \frac{1}{1 - \frac{1}{1-x}}$ , compute  $(f(f(-2)))^{-2}$ . Express your answer as a common fraction.

16. The function  $f(x)$  is defined as  $f(x) = x^2 - x$ . For how many values of  $x$  will  $f(x) = x$ ?

17. The function  $A(x, y)$  is defined by the following rules:

1)  $A(0, n) = n + 1$

2)  $A(m, 0) = A(m - 1, 1)$

3)  $A(m, n) = A(m - 1, A(m, n - 1))$

4)  $m$  and  $n$  are natural numbers.

If  $A(2, 3) = k$ , where  $k$  is a whole number, find the value of  $k$ .

18. Give the letter(s) corresponding to the relations given which are not functions.

a)  $f(x) = \left\lfloor \frac{x}{3} \right\rfloor$

b)  $g: x \rightarrow 2x - 1$

c)  $\{(x, g(x)): g(x) = 3\}$

d)  $\{(0, 0), (1, 0), (2, 0), (3, 0)\}$

e)  $\{(0, 0), (0, 1), (0, 2), (0, 3)\}$

19. The following table lists statistics for the starting line-up of a boys' basketball team:

Player Number	Height (inches)	Year in School
29	74	12
17	71	11
53	78	10
97	73	11
67	71	11

Which of the following statements are not true:

- a) A player's height is a function of his number.
- b) A player's number is a function of his height.
- c) A player's height is a function of his year in school.
- d) A player's year in school is a function of his height.

20. A function  $f$ , defined for integer values only, satisfies

$$f(x) = \begin{cases} x + 2 & \text{when } x < 10 \\ f(x - 2) & \text{when } x \geq 10 \end{cases}$$

What is the maximum value of the function?

21. Suppose the function  $f$  satisfies the following:

- 1)  $f(n) > 0$  for all integers  $n$ ,
- 2)  $f(n) = [f(n - 1)]^2$ , and
- 3)  $f(4) = 81$ .

Find  $f(1)$ .

**Answer List**

- |             |                   |                    |
|-------------|-------------------|--------------------|
| 1. 5        | 2. $2\frac{2}{9}$ | 3. 3               |
| 4. 70       | 5. 11             | 6. $15\frac{5}{8}$ |
| 7. 0        | 8. 36             | 9. 10              |
| 10. 4       | 11. 32            | 12. 12             |
| 13. 32      | 14. 21            | 15. $\frac{1}{4}$  |
| 16. 2       | 17. 9             | 18. e              |
| 19. b and c | 20. 11            | 21. $\sqrt{3}$     |

**Catalog List**

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|---------------|---------------|---------------|
| 1. MCH BF 13  | 2. MCH BF 7   | 3. MCH BF 10  |
| 4. MCH BF 23  | 5. MCH BF 18  | 6. MCH BF 15  |
| 7. MCH BF 31  | 8. MCH BF 48  | 9. MCH BF 46  |
| 10. MCH BF 52 | 11. MCH BF 55 | 12. MCH BF 82 |
| 13. MCH BF 78 | 14. MCH BF 74 | 15. MCC BF 93 |
| 16. MCH BF 87 | 17. MCC BF 1  | 18. MCC BF 7  |
| 19. MCC BF 8  | 20. MCC BF 33 | 21. MCC BF 71 |