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NOTE

83,33 %

## Practice quiz on Types of Functions

TOTAL DES POINTS 6

1. Suppose that  $A = \{1, 2, 10\}$  and  $B = \{4, 8, 40\}$ . Which of the following formulae do **not** define a function  $f : A \rightarrow B$ ?

0 / 1 point

- ☐  $f(1) = 5, f(2) = 8, \text{ and } f(10) = 40.$
- ☐  $f(1) = 4, f(2) = 40, \text{ and } f(10) = 8.$
- ☐  $f(1) = 4, f(2) = 4, \text{ and } f(10) = 4.$
- ☒  $f(a) = 4a, \text{ for each } a \in A$

! Incorrect

A function  $f : A \rightarrow B$  is a rule which assigns an element  $f(a) \in B$  to each  $a \in A$ . This is a perfectly fine rule. In this case, rather than listing out each assignment explicitly, we have given a formula.

2. Suppose that  $A$  contains every person in the VBS study (see the second video in the course if you're confused here!). Suppose that  $Y = \{+, -\}$  and  $Z = \{H, S\}$

1 / 1 point

Suppose that  $T : A \rightarrow Y$  is the function which gives  $T(a) = +$  if person  $a$  tests positive and  $T(a) = -$  if they test negative.

Suppose that  $D : A \rightarrow Z$  is the function which gives  $D(a) = H$  if person  $a$  does not actually have VBS and  $D(a) = S$  if the person actually has VBS.

Which of the following must be true of person  $a$  if we have a false positive?

- ☐  $T(a) = + \text{ and } D(a) = S$
- ☐  $T(a) = - \text{ and } D(a) = H$
- ☐  $T(a) = - \text{ and } D(a) = S$
- ☒  $T(a) = + \text{ and } D(a) = H$

✓ Correct

Recall that a false positive is a positive test result (so  $T(a) = +$ ) which is misleading because the person actually does not have the disease ( $D(a) = H$ )

3. Consider the function  $g : \mathbb{R} \rightarrow \mathbb{R}$  defined by  $g(x) = x^2 - 1$ . Which of the following points are **not** on the graph of  $g$ ?

1 / 1 point

- ☐  $(1, 0)$
- ☐  $(0, -1)$
- ☒  $(2, -1)$
- ☐  $(-1, 0)$

✓ Correct

Recall that the graph of  $g$  consists of all points  $(x, y)$  such that  $y = g(x)$ . Here  $g(2) = 3 \neq -1$ , so the point  $(2, -1)$  is **not** on the graph of  $g$ .

4. Let the point  $A = (2, 4)$ . Which of the following graphs does **not** contain the point  $A$ ?

1 / 1 point

- ☒ The graph of  $h(x) = x - 1$
- ☐ The graph of  $g(x) = x + 2$
- ☐ The graph of  $f(x) = 2x$

☐ The graph of  $s(x) = x^2$

✓ Correct

The graph of  $h$  consists of all points  $(x, y)$  such that  $y = h(x)$ . Here  $h(2) = 1 \neq 4$ , so the point  $(2, 4)$  is *not* on the graph of  $h$ .

5. Suppose that  $h(x) = -3x + 4$ . Which of the following statements is true?

1 / 1 point

- ☐  $h$  is a strictly increasing function
- ☐  $h$  is neither a strictly increasing function nor a strictly decreasing function.
- ☐ All statements are correct
- ☒  $h$  is a strictly decreasing function

✓ Correct

A function  $h$  is called strictly decreasing if whenever  $a < b$ , then  $h(a) > h(b)$

Since the graph of  $h$  is a line with negative slope, this is in fact true!

6. Suppose that  $f : \mathbb{R} \rightarrow \mathbb{R}$  is a strictly increasing function, with  $f(3) = 15$

1 / 1 point

Which of the following is a possible value for  $f(3.7)$ ?

- ☐ 3
- ☒ 17
- ☐ 14.7
- ☐ -3

✓ Correct

A function  $f$  is called strictly increasing if whenever  $a < b$ , then  $f(a) < f(b)$ .

Since  $f(3) = 15$  is given and  $3 < 3.7$ , it must be that  $15 < f(3.7)$ , and this answer satisfies that.