

1. Which one point can be removed from Figure 1.1 to make it the graph of a function?
 (a) A (b) B (c) C (d) D (e) Any one of the previous

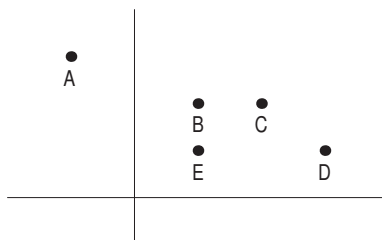


Figure 1.1

ANSWER:

(b)

COMMENT:

Ask about point E.

2. A function can be represented by a

- (a) Verbal description
 (b) Table
 (c) Graph
 (d) Formula
 (e) All of the above

ANSWER:

(e)

COMMENT:

Ask students to give examples of each.

3. The graph in Figure 1.2 remains the graph of a function when which of the following points are added?

- (a) $(0, 0)$
 (b) $(-100, 1)$
 (c) $(1, -100)$
 (d) All of the above
 (e) $(0, 0)$ and $(-100, 1)$

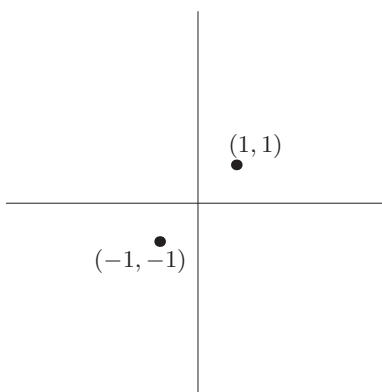


Figure 1.2

ANSWER:

(e)

COMMENT:

Some students automatically connect the points and think that this is the function we are asking about.

4. A graph with only one point is always the graph of a function.

- (a) True
- (b) False

ANSWER:

- (a) True

5. A table with only one entry is always the table of values of a function.

- (a) True
- (b) False

ANSWER:

- (a) True

6. A graph with only two points is always the graph of a function.

- (a) True
- (b) False

ANSWER:

- (b) False

7. If $f(x) = 5$ then $f(2) = 10$

- (a) True
- (b) False

ANSWER:

- (b) False

COMMENT:

You might also ask students if $f(x) \times 2 = 10$.

8. How many letters of the alphabet could be the graph of a function?

- (a) None
- (b) One
- (c) Two
- (d) Most of them
- (e) All of them

ANSWER:

- (c) Only v and w, since the other letters contain two or more points on a vertical line.

COMMENT:

You may want to give an example to get students started.

ConceptTests and Answers and Comments for Section 1.2

1. Which of the functions shown in Figure 1.3 are increasing?

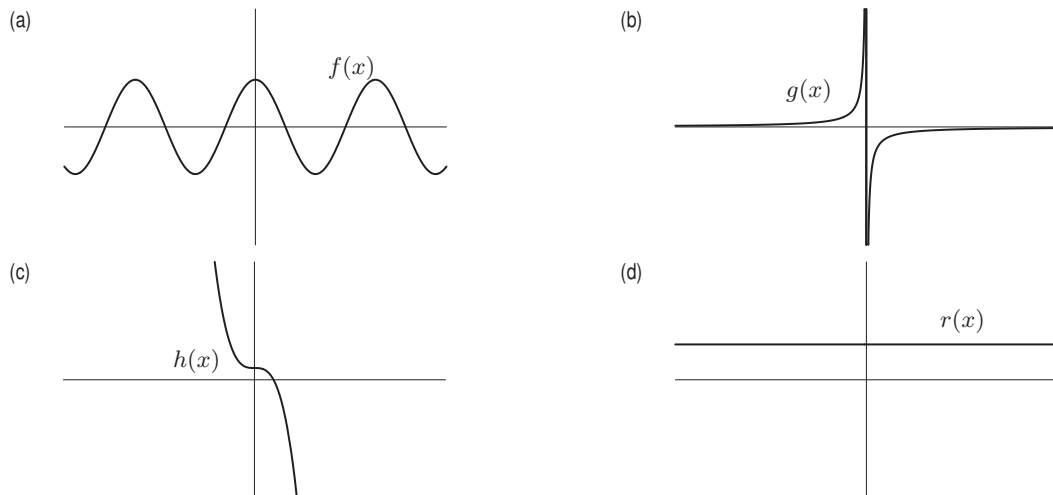


Figure 1.3

ANSWER:

None of them.

COMMENT:

Without a stated interval the function is assumed to be globally increasing. The function $g(x)$ is non-increasing for intervals across the origin.

2. In Figure 1.4, if $h(x) = f(x) - g(x)$ then the rate of change of h is

- (a) Not a constant
- (b) Positive
- (c) Negative
- (d) Zero
- (e) Undefined

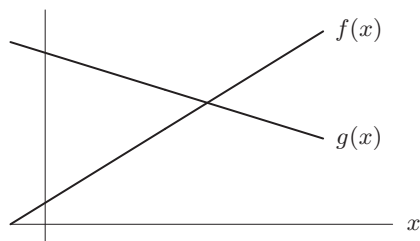


Figure 1.4

ANSWER:

(b)

COMMENT:

Students may need a hint to get them started. Prompt them to think about the rate of change of $f(x)$ and $g(x)$ separately first and then combine them.

3. In Table 1.1 the average rate of change of h on every interval is
- (a) No rate of change
 - (b) Positive
 - (c) Negative
 - (d) Zero

Table 1.1

t	0	24	48	72
$h(t)$	75	75	75	75

ANSWER:

(d)

COMMENT:

Note how (a) and (d) are different.

4. Which table shows an increasing function?

(a)

t	0	24	48	72
$h(t)$	75	75	75	75

(b)

t	4	3	2	1
$r(t)$	5	10	15	20

(c)

t	0	2	4	8
$s(t)$	-25	-20	-15	-10

(d)

t	0	-24	-48	-72
$m(t)$	5	10	15	20

ANSWER:

(c)

COMMENT:

Ask students why (d) is not a correct answer. Note that the input values are listed in decreasing order.

5. If $T = 0.25n + 100$ then the average rate of change of T with respect to n is

(a) $\frac{\Delta n}{\Delta T}$

(b) $\frac{\Delta T}{n}$

(c) $\frac{\Delta T}{\Delta n}$

(d) $\frac{T}{n}$

ANSWER:

(c)

COMMENT:

New notation is often harder for students than we think. It is worth spending some time to see if they can use it correctly.

6. The average rate of change of a function $T = f(x)$ on an interval is

(a) $\frac{\Delta T}{\Delta x}$

(b) $\frac{\text{Rise}}{\text{Run}}$

(c) Slope, $\frac{f(b) - f(a)}{b - a}$

(d) All of the above

ANSWER:

(d)

COMMENT:

New notation is often harder for students than we think. It is worth spending some time to see if they can use it correctly.

ConceptTests and Answers and Comments for Section 1.3

1. Which table shows data from a linear function?

(a)

t	0	1	2	3
$f(t)$	0	1	4	8

(c)

t	1	0	2	0.1
$h(t)$	3.3	1.2	5.4	1.41

(b)

t	0	1	4	8
$g(t)$	5	10	15	20

(d)

t	-3	0	2	4
$s(t)$	-6	0	6	12

ANSWER:

(c)

COMMENT:

Note that the input values are unevenly spaced and out of order in (c).

2. If points
- $(1, 3)$
- ,
- $(3, a)$
- , and
- $(b, 11)$
- all lie on the same line, then the number of possible values for
- a
- and
- b
- is

- (a) None
 (b) One
 (c) Two
 (d) Infinite

ANSWER:

(d)

COMMENT:

Encourage students to draw a graph.

3. Which of the following points are definitely on the
- x
- axis?

- (a) $(0, 1)$
 (b) $(b, 0)$
 (c) $(0, c)$
 (d) $(0, 0)$

ANSWER:

(b) and (d)

COMMENT:

Encourage students to draw a graph.

Use Figure 1.5 to answer Problems 4–7. Use answers:

- (a) A
 (b) B
 (c) C
 (d) D
 (e) None

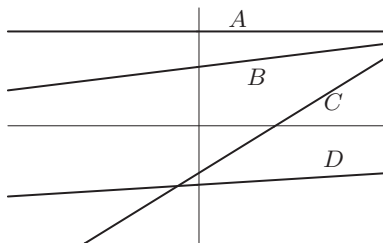


Figure 1.5

4. Which function has the greatest slope?

ANSWER:

(c)