Functions

Multiple Choice
Identify the choice that best completes the statement or answers the question.

_____ 1. Give the domain and range of the relation.

x	y
4	9
6	13
0	0
–5	–9

a. D: {–9, 0, 9, 13}; R: {–5, 0, 4, 6}   c. D: {–5, 4, 6}; R: {–9, 9, 13}
b. D: {4, 6, –5, 9, 13, –9}; R: {0}   d. D: {–5, 0, 4, 6}; R: {–9, 0, 9, 13}

_____ 2. Give the domain and range of the relation.

x	y
5	11
6	13
0	0
–8	–15

a. D: {–15, 11, 13}; R: {–8, 5, 6}
b. D: {–8, 0, 5, 6}; R: {–15, 0, 11, 13}
c. D: {–15, 0, 11, 13}; R: {–8, 0, 5, 6}
d. D: {0}; R: {5, 6, –8, 11, 13, –15}

_____ 3. Give the domain and range of the relation. Tell whether the relation is a function.

x	y
0	–5
1	–1
1	3
1	6

a. D: {0, 1}; R: {–5, –1, 3, 6}   c. D: {0, 1}; R: {–5, –1, 3, 6}
  The relation is a function.   The relation is not a function.
b. D: {–5, –1, 3, 6}; R: {0, 1}   d. D: {–5, –1, 3, 6}; R: {0, 1}
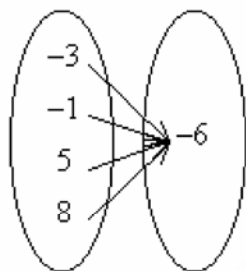 The relation is a function.   The relation is not a function.

____   4. Identify the mapping diagram that represents the relation and determine whether the relation is a function.
$\{(-3,-6),(-1,-6),(5,-6),(8,-6)\}$

a.

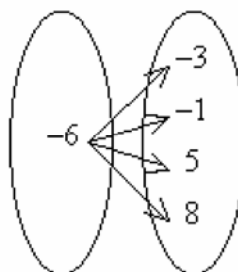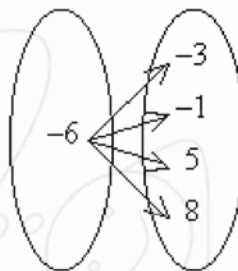The relation is not a function.

c.

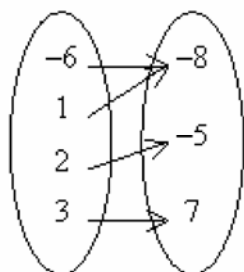The relation is a function.

b.

The relation is a function.

d.

The relation is not a function.

2

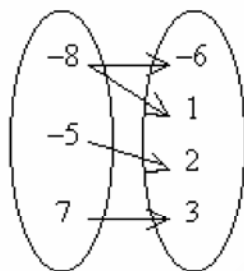____ 5. Identify the mapping diagram that represents the relation and determine whether the relation is a function.
$\{(-8,-6),(-5,2),(-8,1),(7,3)\}$

a.

The relation is a function.

c.
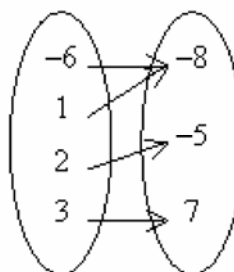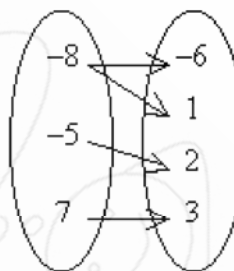

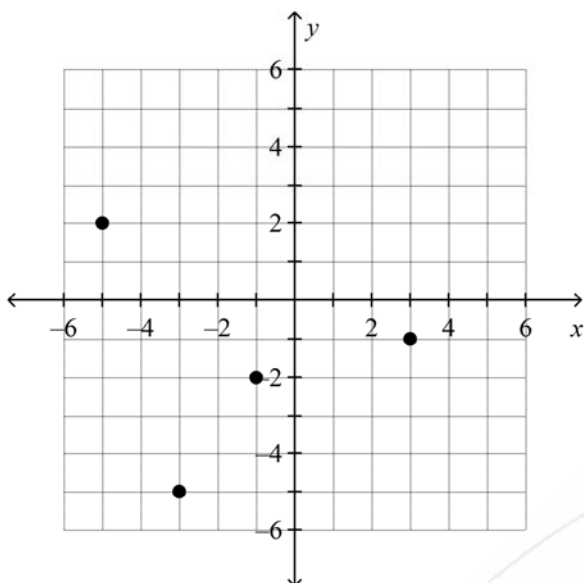The relation is not a function

b.

The relation is a function.
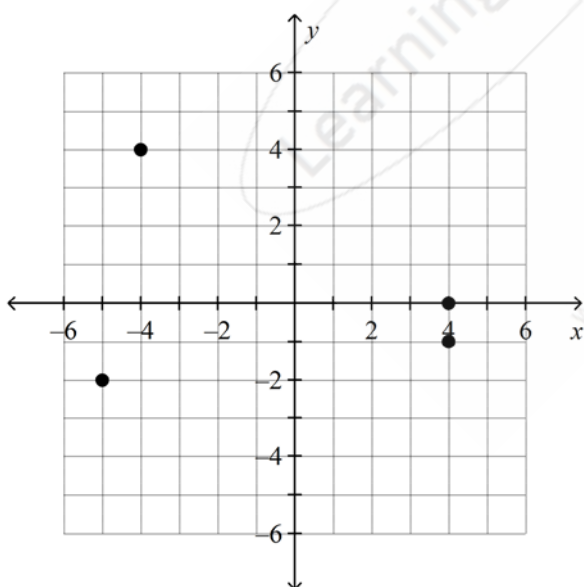
d.

The relation is not a function.

Short Answer

6. Identify the domain and range of the relation.
$\{(-4,2),(-9,-5),(-4,12),(8,-8)\}$

Use the vertical line test to determine whether the relation is a function.

7.

8. $\{(0, -1), (-5, 1), (-3, -3), (-5, -5)\}$

9.

10. $\{(3, 0), (2, -1), (-1, 4), (1, -2)\}$

Functions
Answer Section

MULTIPLE CHOICE

1. ANS: D
   The domain is the set of all *x*-values. The range is the set of all *y*-values.

	Feedback
A	The domain is the set of all *x*-values. The range is the set of all *y*-values.
B	The domain includes only the *x*-values.
C	The domain is the set of all *x*-values.
D	Correct!

   PTS: 1   DIF: Basic   REF: Page 237
   OBJ: 4-2.2 Finding the Domain and Range of a Relation   NAT: 12.5.1.g
   TOP: 4-2 Relations and Functions   KEY: domain | range | function | relation

2. ANS: B
   The domain is the set of all *x*-values. The range is the set of all *y*-values.

	Feedback
A	The domain is the set of all *x*-values. The range is the set of all *y*-values.
B	Correct!
C	The domain is the set of all *x*-values. The range is the set of all *y*-values.
D	The range includes only the *y*-values.

   PTS: 1   DIF: Basic   REF: Page 237
   OBJ: 4-2.2 Finding the Domain and Range of a Relation   NAT: 12.5.1.g
   TOP: 4-2 Relations and Functions   KEY: domain | range | function | relation

3. ANS: C
   A function is a special type of relation that pairs each *x*-value with exactly one *y*-value. If the same *x*-value has more than one *y*-value, then the relation is not a function.

	Feedback
A	A function has a unique *y*-value for each *x*-value.
B	A function has a unique *y*-value for each *x*-value.
C	Correct!
D	Check the domain and the range. The domain is the set of all *x*-values; the range is the set of all *y*-values.

   PTS: 1   DIF: Basic   REF: Page 237   OBJ: 4-2.3 Identifying Functions
   NAT: 12.5.1.e   TOP: 4-2 Relations and Functions   KEY: function | relation | input | output

4. ANS: B   PTS: 1   DIF: L3
   REF: 4-6 Formalizing Relations and Functions
   OBJ: 4-6.1 To determine whether a relation is a function   NAT: N.2.c| A.1.b| A.1.g| A.1.i| A.3.f
   TOP: 4-6 Problem 1 Identifying Functions Using Mapping Diagrams
   KEY: relation | domain | range   DOK: DOK 2

1

5. ANS: D   PTS: 1   DIF: L3
    REF: 4-6 Formalizing Relations and Functions
    OBJ: 4-6.1 To determine whether a relation is a function   NAT: N.2.c| A.1.b| A.1.g| A.1.i| A.3.f
    TOP: 4-6 Problem 1 Identifying Functions Using Mapping Diagrams
    KEY: relation | domain | range   DOK: DOK 2

SHORT ANSWER

6. ANS:
    The domain is {−9, −4, 8}.
    The range is {−8, −5, 2, 12}.

    PTS: 1   DIF: L3   REF: 4-6 Formalizing Relations and Functions
    OBJ: 4-6.2 To find domain and range and use function notation
    NAT: N.2.c| A.1.b| A.1.g| A.1.i| A.3.f
    TOP: 4-6 Problem 1 Identifying Functions Using Mapping Diagrams
    KEY: relation | domain | range   DOK: DOK 2

7. ANS:
    The relation is a function.

    PTS: 1   DIF: L2   REF: 4-6 Formalizing Relations and Functions
    OBJ: 4-6.1 To determine whether a relation is a function   NAT: N.2.c| A.1.b| A.1.g| A.1.i| A.3.f
    TOP: 4-6 Problem 2 Identifying Functions Using the Vertical Line Test
    KEY: relation | vertical line test   DOK: DOK 2

8. ANS:
    The relation is not a function.

    PTS: 1   DIF: L3   REF: 4-6 Formalizing Relations and Functions
    OBJ: 4-6.1 To determine whether a relation is a function   NAT: N.2.c| A.1.b| A.1.g| A.1.i| A.3.f
    TOP: 4-6 Problem 2 Identifying Functions Using the Vertical Line Test
    KEY: relation | vertical line test   DOK: DOK 2

9. ANS:
    The relation is not a function.

    PTS: 1   DIF: L2   REF: 4-6 Formalizing Relations and Functions
    OBJ: 4-6.1 To determine whether a relation is a function   NAT: N.2.c| A.1.b| A.1.g| A.1.i| A.3.f
    TOP: 4-6 Problem 2 Identifying Functions Using the Vertical Line Test
    KEY: relation | vertical line test   DOK: DOK 2

10. ANS:
    The relation is a function.

    PTS: 1   DIF: L3   REF: 4-6 Formalizing Relations and Functions
    OBJ: 4-6.1 To determine whether a relation is a function   NAT: N.2.c| A.1.b| A.1.g| A.1.i| A.3.f
    TOP: 4-6 Problem 2 Identifying Functions Using the Vertical Line Test
    KEY: relation | vertical line test   DOK: DOK 2