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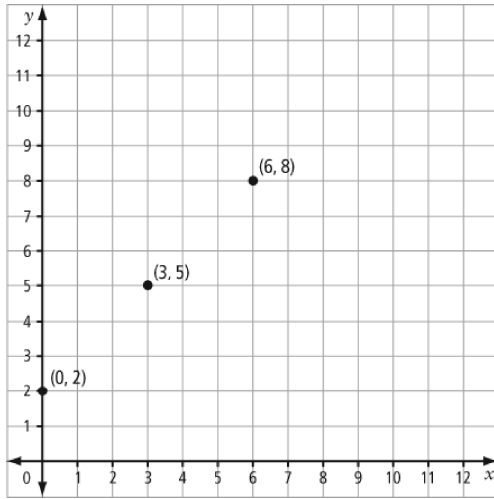
Multiple Choice
Identify the choice that best completes the statement or answers the question.

Choose the best answer.

_____ 1. Which statement best describes the pattern of this graph?

    a.   To move from one point to the next, you go three units horizontally and three units vertically.

    b.   To move from one point to the next, you go three units horizontally and two units vertically.

    c.   To move from one point to the next, you go two units horizontally and three units vertically.

    d.   To move from one point to the next, you go two units horizontally and two units vertically.
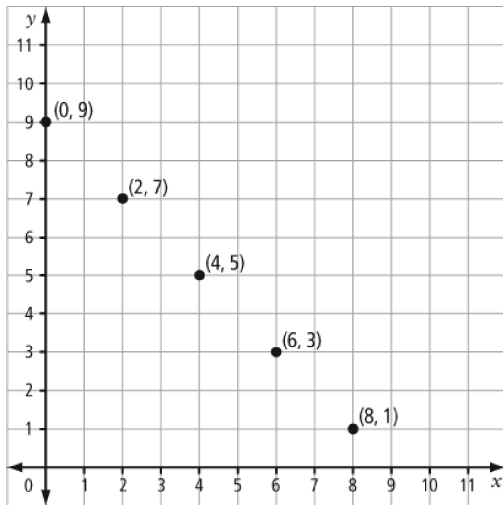
_____ 2. Which statement or statements best describe the pattern of this graph?
      A) As the x-value increases by one, the y-value increases by one.
      B) As the x-value decreases by one, the y-value increases by one.
      C) As the x-value increases by one, the y-value decreases by one.
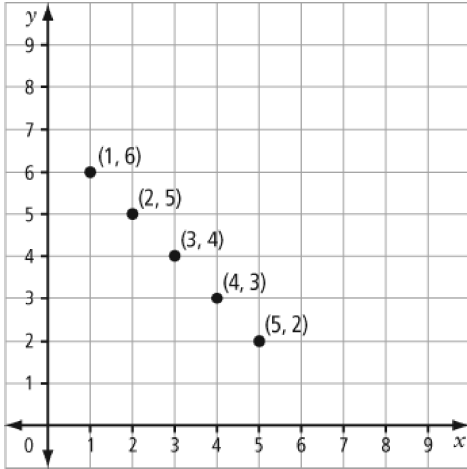
      a.   A
      b.   B and C
      c.   A and C
      d.   C

_____ 3. Which statement best describes the pattern of this graph?
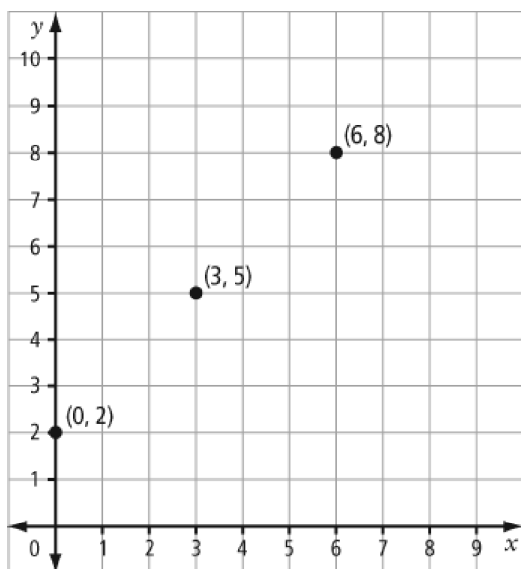

      a.   As the x-value increases by one, the y-value decreases by two.
      b.   As the x-value increases by two, the y-value increases by two.
      c.   As the x-value decreases by two, the y-value decreases by two.
      d.   As the x-value decreases by two, the y-value increases by one.

____ 4. What table of values is represented by this graph?

a.

x	y
0	2
3	5
6	8

c.

x	y
2	0
3	5
8	6

b.

x	y
2	0
5	3
8	6

d.

x	y
2	0
3	5
6	8

_____   5.   What table of values is represented by this graph?
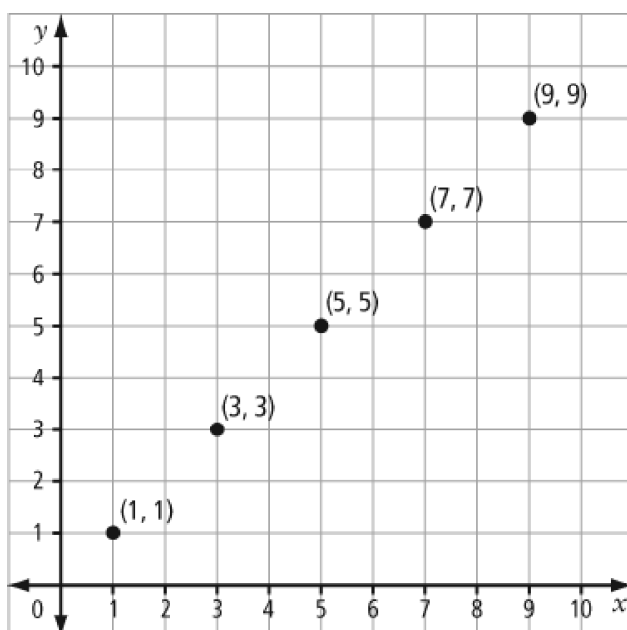
a.

x	y
1	5
1	7
3	7
3	9
5	9

c.

x	y
1	1
3	3
5	5
7	7
9	9

b.

x	y
1	3
3	1
5	7
7	9
9	5

d.

x	y
1	9
3	7
5	5
7	3
9	1

_____ 6. Which table of values represents this graph?
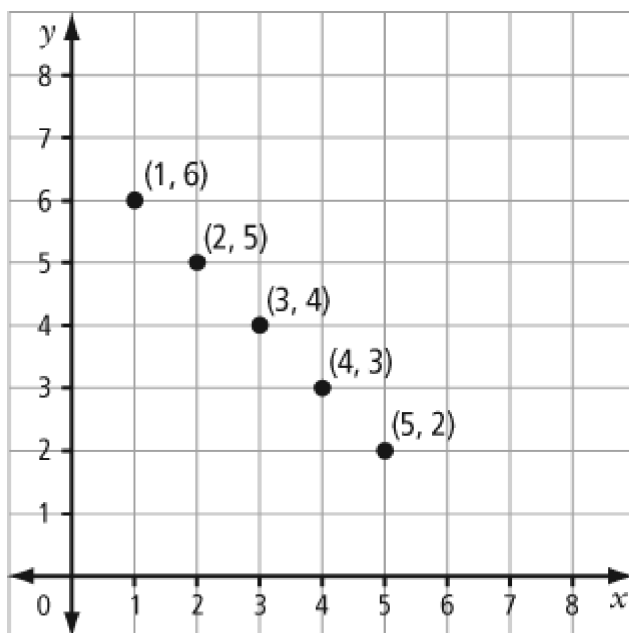
a.

x	y
2	5
3	4
4	3
5	2
6	1

c.

x	y
6	1
5	2
4	3
3	4
2	5

b.

x	y
1	2
3	4
5	6
5	4
3	2

d.

x	y
1	6
2	5
3	4
4	3
5	2

____   7.   Which table of values represents this graph?

a.

x	y
9	0
7	2
5	4
3	6
1	8

c.

x	y
0	−9
2	−7
4	−5
6	−3
8	−1

b.
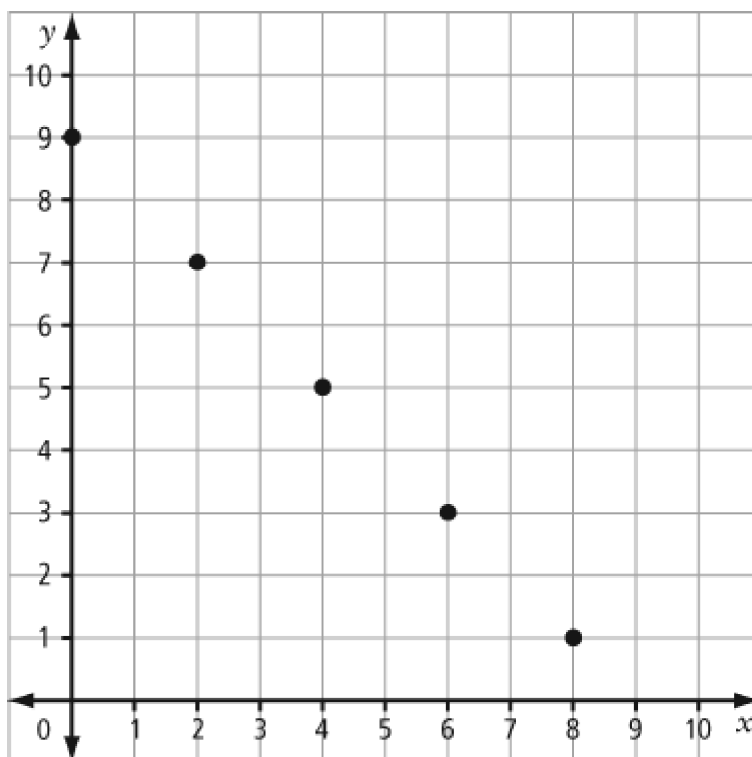
x	y
0	9
2	7
4	5
6	3
8	1

d.

x	y
−9	0
−7	2
−5	4
−3	6
−1	8

_____ 8. What are the coordinates for point C on the graph?
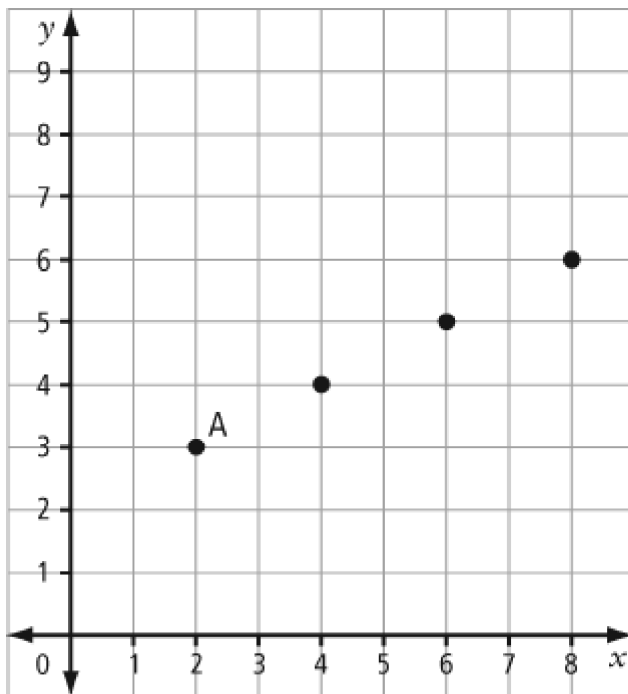

a. (6, 5)   c. (5, –6)
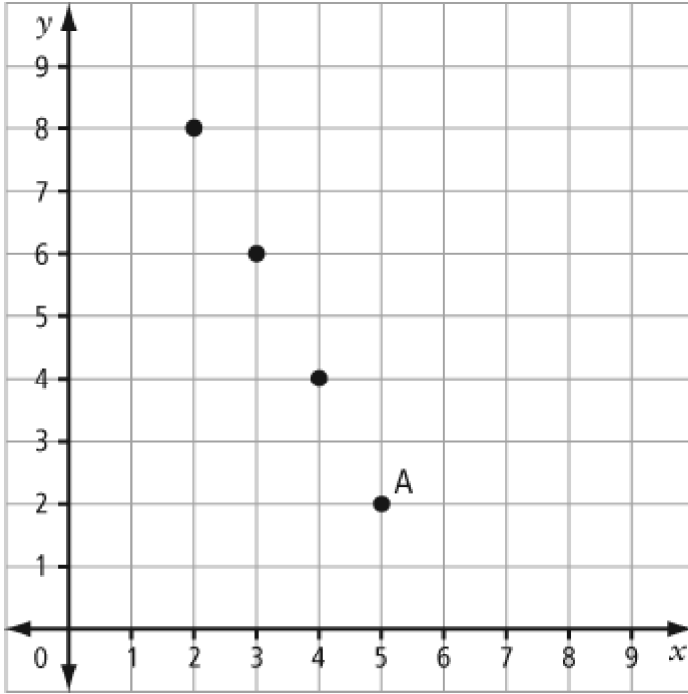b. (5, 6)   d. (–6, 5)
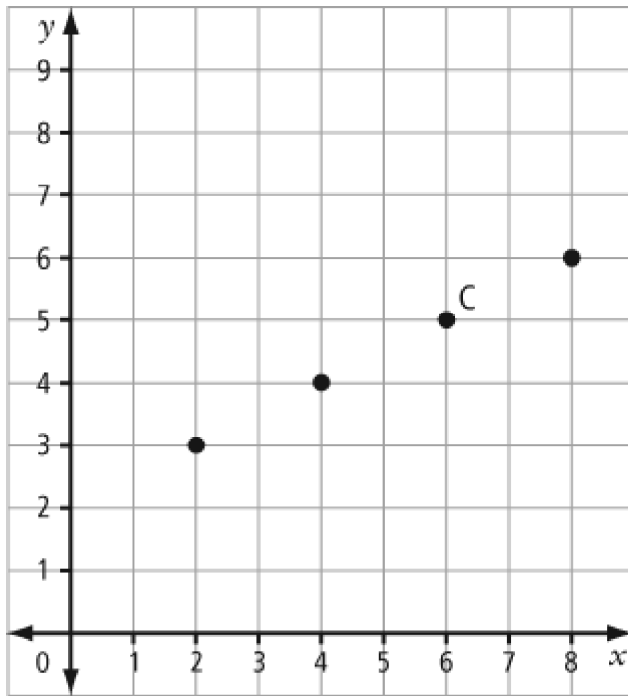
_____ 9. What are the coordinates for point A on the graph?

a. (3, 2)   c. (–2, 3)
b. (2, 3)   d. (–3, 2)

_____ 10. What are the coordinates for point A on the graph?

a. (2, 8)	c.	(4, 4)
b. (3, 6)	d.	(5, 2)

_____ 11. What are the coordinates for point B on the graph?

a. (2, 8)	c.	(4, 4)
b. (3, 6)	d.	(5, 2)
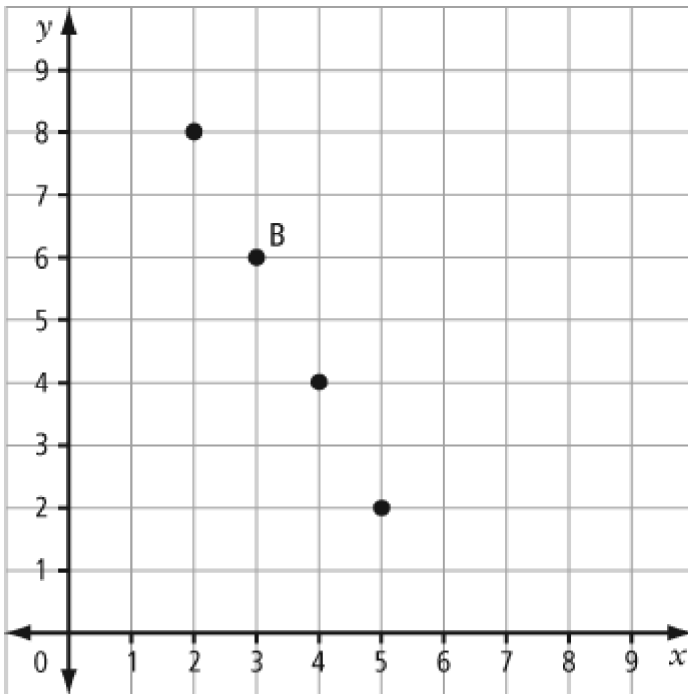
_____ 12. A graph of distance travelled for a car travelling at 95 km/h is shown. What was the distance travelled after
three hours?
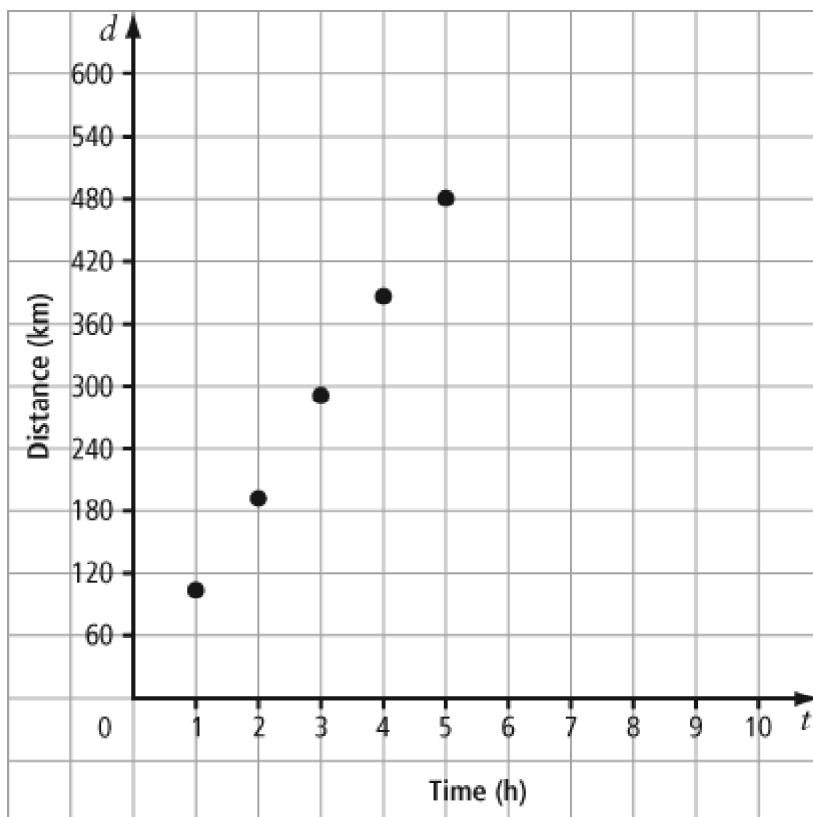
| a. | 95 km | c. | 285 km |
| b. | 190 km | d. | 475 km |

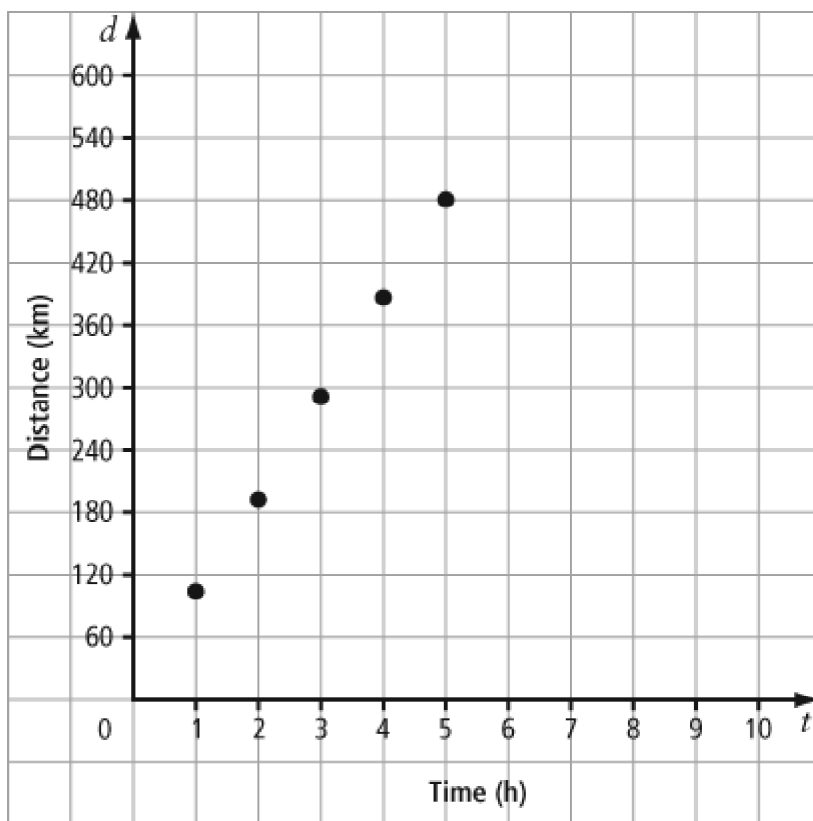_____ 13. A graph of distance travelled for a car travelling at 95 km/h is shown. How long did it take to travel 380 km?

a. 2 h	c. 4 h
b. 3 h	d. 5 h

Paula measures the heights of stacked blocks and records the results on the graph.

_____ 14. What is the height of the blocks at point A?
- a.   24 cm
- b.   28 cm
- c.   32 cm
- d.   36 cm

_____ 15. What is the height of the blocks at point B?
- a.   16 cm
- b.   28 cm
- c.   32 cm
- d.   36 cm

_____ 16. How many blocks does point A represent?
- a.   3
- b.   4
- c.   5
- d.   6

_____ 17. What are the coordinates of point A?
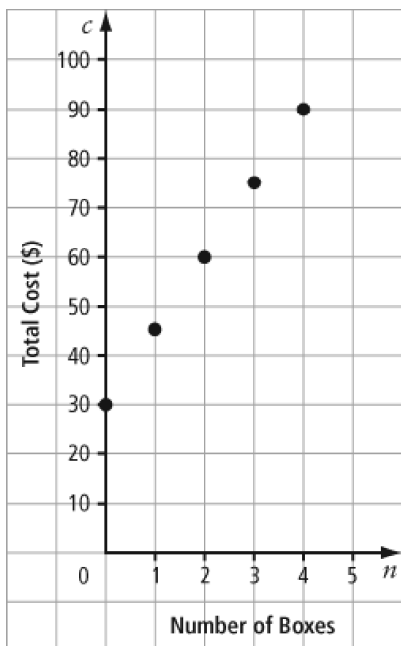- a.   (3, 24)
- b.   (4, 32)
- c.   (5, 40)
- d.   (6, 48)

The cost to purchase boxes of tickets is shown in the table below. The set fee to design the tickets is $30.

Number of Boxes, n	Total Cost, c ($)
0	30
1	45
2	60
3	75
4	90

____ 18. Which graph represents the ordered pairs in this table?

a.

Number of Boxes

c.

Number of Boxes

b.

Number of Boxes

d.

Number of Boxes
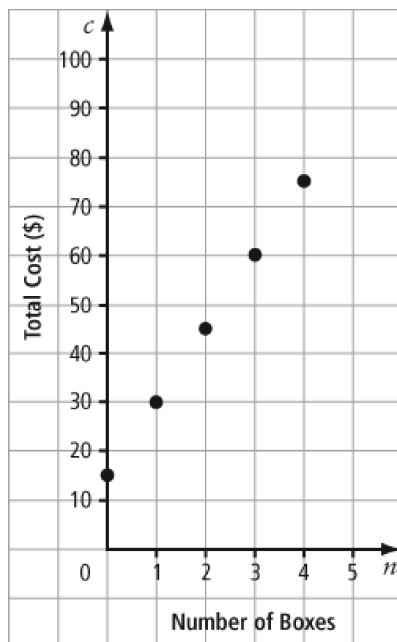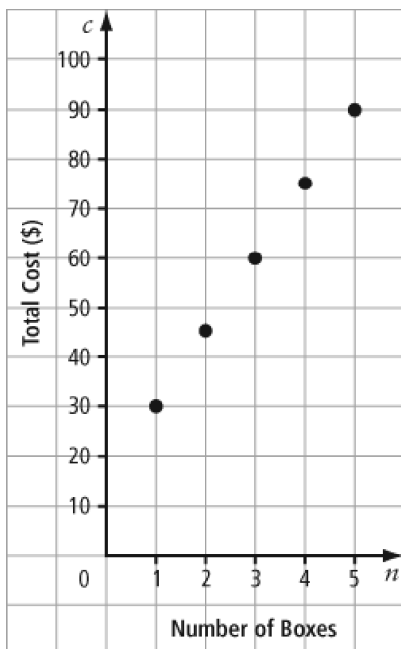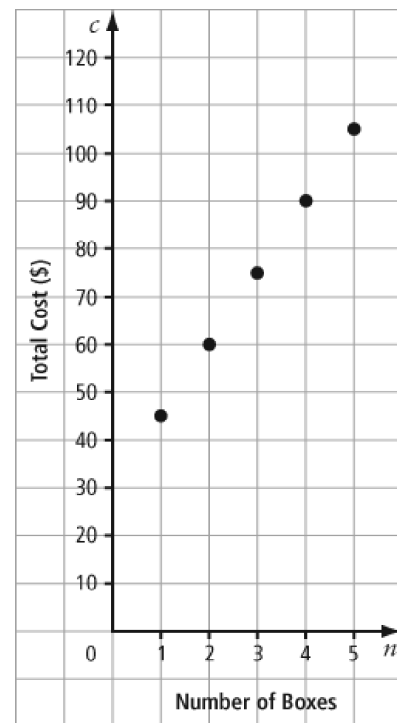
_____ 19. Which is the cost increase for each additional box?

a.	$5	c.	$15
b.	$10	d.	$30

It costs $25 to design a T-shirt. The total cost of up to six T-shirts is shown in the table below.

Number of T-shirts, n	Total Cost, c ($)
0	25
1	31
2	37
3	43
4	49
5	55
6	61

_____ 20. Which graph represents the ordered pairs in this table?

a.

c.

b.

d.

_____ 21. What is the cost per T-shirt without including the design fee?

a. $1   c. $15
b. $6   d. $25
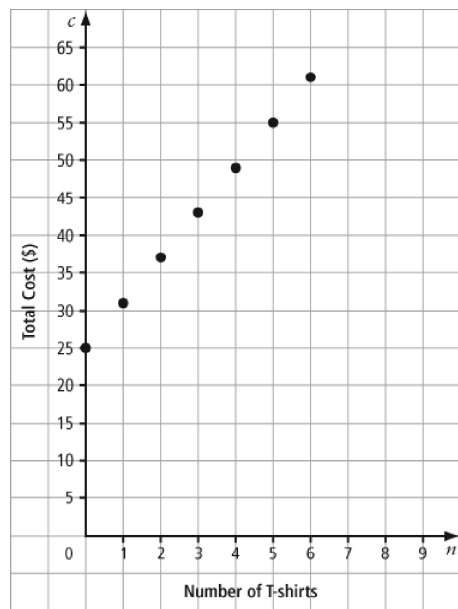
Sanjay buys caps for the basketball team. He pays the designer a $15 set-up fee. The cost for up to five bags of caps is shown.

Number of Bags, n	Total Cost, c ($)
0	15
1	30
2	45
3	60
4	75
5	90

_____ 22. Which graph represents the ordered pairs in this table?

a.
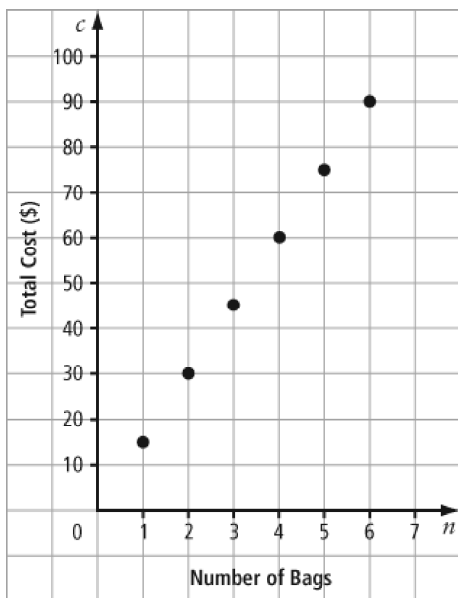

c.
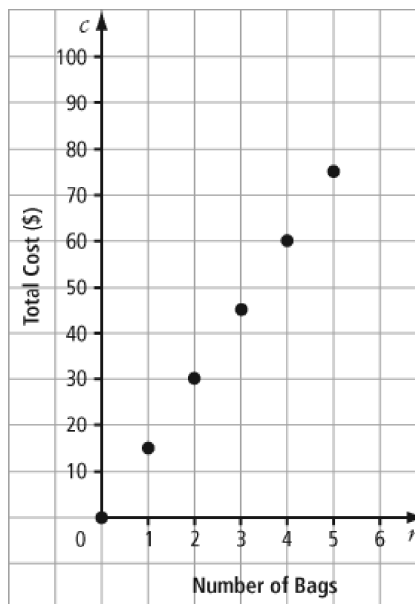
b.
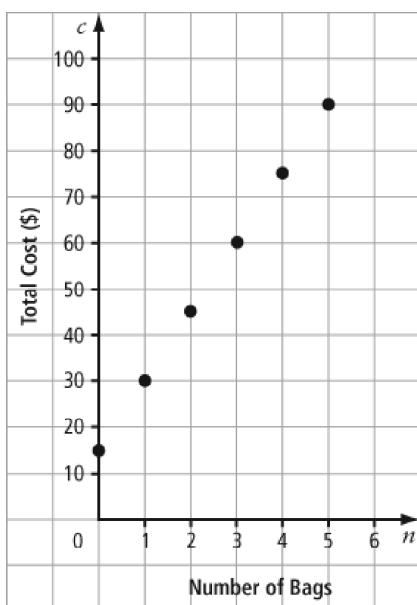
d.
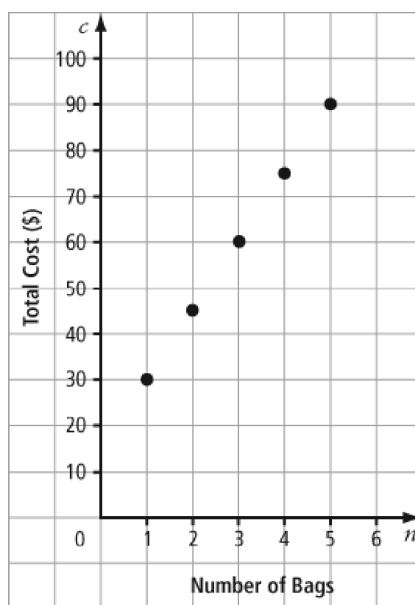
_____ 23. What is the cost increase for each additional bag of caps?
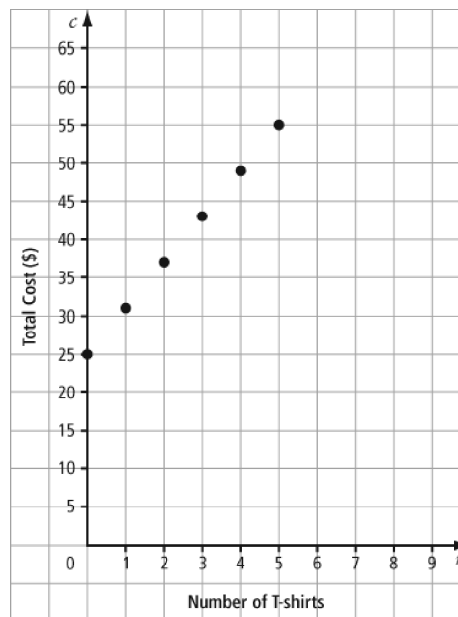   a. $5   c. $15
   b. $10   d. $30

_____ 24. There are five caps in each bag. What is the price per cap if you purchase 2 bags?
   a. $1.50   c. $10.00
   b. $4.50   d. $15.00

_____ 25. Esteban deposited $1 into his bank account on the first day. The next day he deposited $2; on the third day he deposited $4. What ordered pair will be in the next cell of the table?

Day	1	2	3	
Amount ($)	1	2	4	

a. (4, 5)
b. (4, 6)

c. (4, 7)
d. (4, 8)

_____ 26. David works at a hot dog stand. He earns $40 per day, plus $0.30 for every hot dog he sells. His earnings are shown in the table below. How much would he make if he sold 30 hot dogs in one day?

Number of Hot Dogs Sold Per Day	David's Earnings ($)
0	40
10	43
20	46
30	
40	

a. $47
b. $48

c. $49
d. $50

_____ 27. David works at a hot dog stand. He earns $40 per day, plus $0.30 for every hot dog he sells. His earnings are shown in the table below. How much would he make if he sold 60 hot dogs in one day?

Number of Hot Dogs Sold Per Day	David's Earnings ($)
0	40
10	43
20	46
30	
40	

a. $49
b. $52

c. $58
d. $61

_____ 28.   Which of the following tables of values represents a linear relationship?

a.

x	y
−1	−1
1	3
3	7
5	11
7	15

c.

x	y
−1	−1
1	0
3	3
5	8
7	15

b.

x	y
−1	1
1	1
3	9
5	25
7	49

d.

x	y
−1	−1
1	5
3	11
5	17
7	14

____ 29. Which of the following tables of values does *not* represent a linear relationship?

a.

x	y
2	5
4	9
6	13
8	17
10	21

c.

x	y
3	7
6	16
9	25
12	34
15	43

b.

x	y
−1	1
1	1
3	9
5	25
7	49

d.

x	y
1.5	1
3.5	5
5.5	9
7.5	13
9.5	17

____ 30. The height of a stack of recycling bins can be described as 12 cm plus 3 cm for each bin in the stack. Which of the following tables of values represents this description?

a.

Number of Bins	Total Height (cm)
1	12
2	15
3	18
4	21
5	24

c.

Number of Bins	Total Height (cm)
0	12
1	15
2	18
3	21
4	24

b.

Number of Bins	Total Height (cm)
1	3
2	15
3	27
4	39
5	51

d.

Number of Bins	Total Height (cm)
0	3
1	15
2	27
3	39
4	51

_____ 31. Ted was given this set of ordered pairs: (7, 12), (8, 15), (9, 18), (10, 21). As the *x*-coordinate increases by one, what happens to the *y*-coordinate?
    a.   It does not change.
    b.   It decreases by three.
    c.   It increases by two.
    d.   It increases by three.

_____ 32. Ted was given this set of ordered pairs: (7, 21), (8, 18), (9, 15), (10, 12). As the *y*-coordinate decreases by three, what happens to the *x*-coordinate?
    a.   It does not change.
    b.   It decreases by one.
    c.   It increases by one.
    d.   It increases by two.

_____ 33. Mike counted the number of shots on goal he had during his time on the ice. Here is the pattern for four games:

Hockey Game	Number of Shots on Goal
1	1
2	3
3	5
4	7

If this pattern were to continue, how many shots on goal would he have in game 8?

    a.   15
    b.   18
    c.   25
    d.   27

_____ 34. Jessica has been cutting lawns to make money for a new MP3 player. Here is a table showing the total number of lawns she has cut at the end of each day.

Day	Number of Lawns
1	6
2	12
3	18
4	24

If the above pattern continues, on what day will Jessica have cut 210 lawns?
    a.   42
    b.   30
    c.   35
    d.   33

_____ 35. The value of the *n*th term in the sequence 0, 1, 2, 3, 4, 5, 6, … is
    a. $n + 1$
    b. $n - 1$
    c. $n \times 1$
    d. $1 - n$

_____ 36. Esteban deposited $1 into his bank account on the first day. The next day he deposited $2; on the third day he deposited $4. The table shows the amounts of the first 10 deposits. How much will he have in his account after 12 days?

Day	1	2	3	4	5	6	7	8	9	10
Amount ($)	1	2	4	8	16	32	64	128	256	512

a. $1023
b. $2047
c. $4095
d. $8191

_____ 37. Robert buys jellybeans from a vending machine. What value is missing from the chart?

Number of Dimes	1	2	3	4	5	6	7	8
Number of Jellybeans	6	12	18	☐	30	36	42	48

a. 22
b. 24
c. 26
d. 28

_____ 38. Which table of values is best represented by the linear relation $y = 3x + 4$?

a.

x	y
1	7
2	10
3	13
4	16
5	19

c.

x	y
3	5
6	14
9	23
12	32
15	41

b.

x	y
1	−1
2	2
3	5
4	8
5	11

d.

x	y
7	1
10	2
13	3
16	4
19	5

_____ 39. Which table of values is best represented by the linear relation $y = 3x - 4$?

a.

x	y
1	7
2	10
3	13
4	16
5	19

c.

x	y
2	10
4	16
6	22
8	28
10	34

b.

x	y
1	−1
2	2
3	5
4	8
5	11

d.

x	y
7	1
10	2
13	3
16	4
19	5

_____ 40. Which table of values is best represented by the linear relation $y = 3x - 4$?

a.

x	y
1	7
2	10
3	13
4	16
5	19

c.

x	y
3	5
6	14
9	23
12	32
15	41

b.

x	y
2	10
4	16
6	22
8	28
10	34

d.

x	y
7	1
10	2
13	3
16	4
19	5

_____   41.   Which graph is best represented by the linear relation $y = 2x + 3$?

a.

c.

b.

d.

_____ 42. Which graph is best represented by the linear relation $y = 2x + 4$?
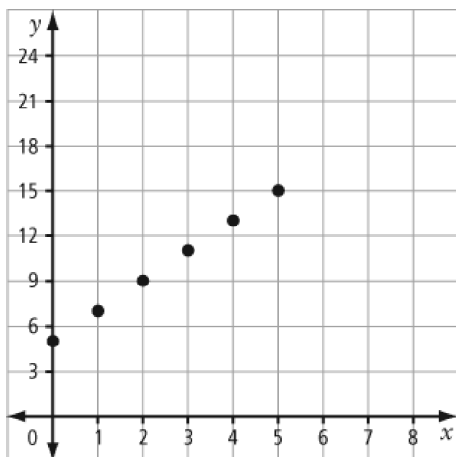
a.

c.

b.
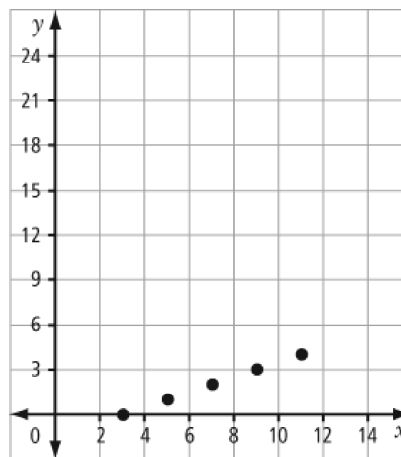

d.
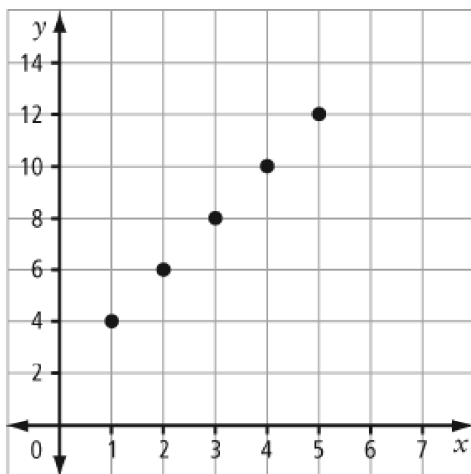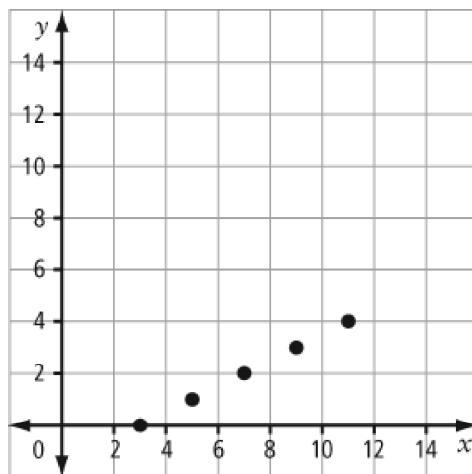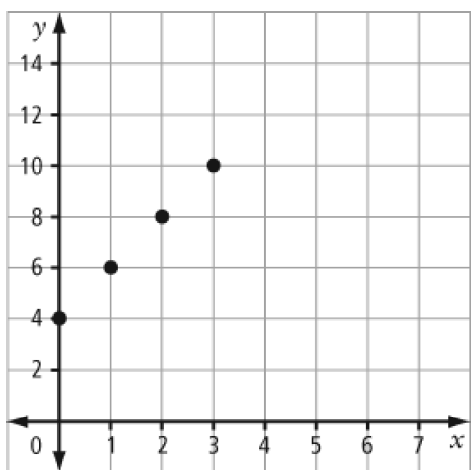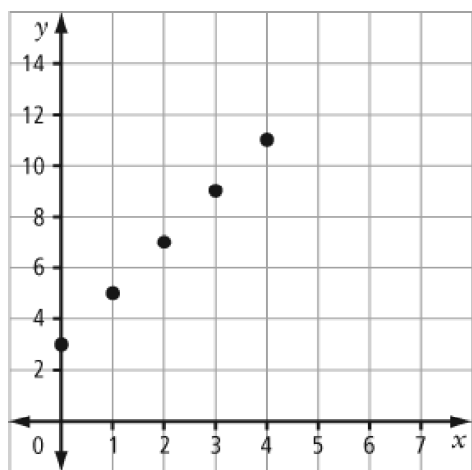
_____ 43. Which graph is best represented by the linear relation $y = 2x + 5$?
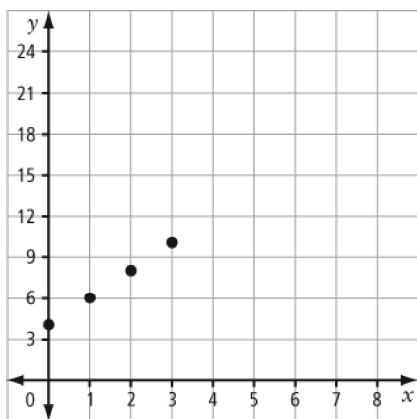
a.
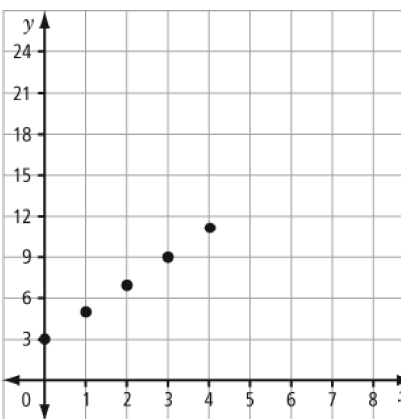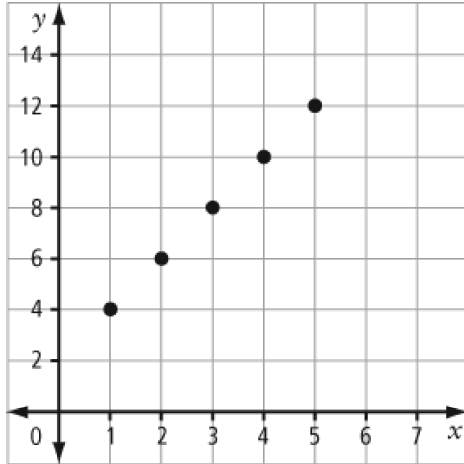

c.
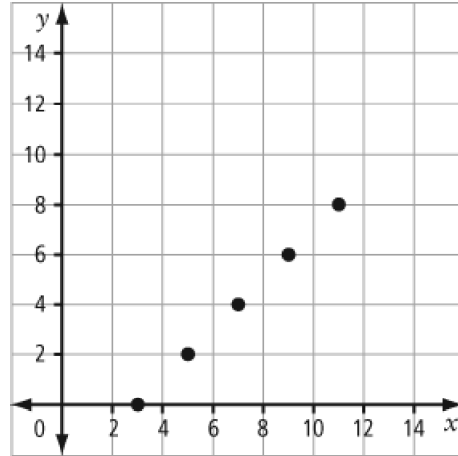

b.

d.

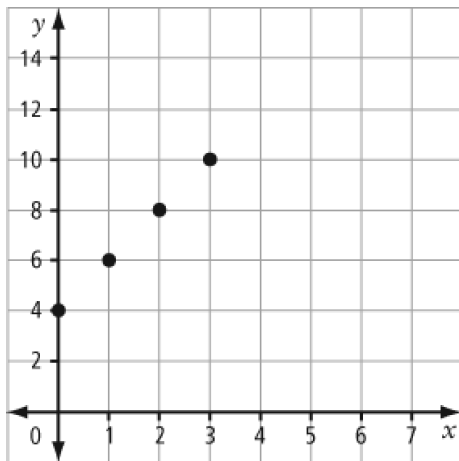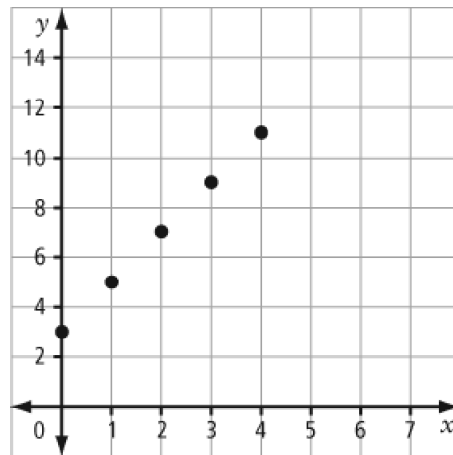____ 44. Which graph is best represented by the linear relation $y = x - 3$?

a.

c.

b.

d.

____ 45. What is the missing value in this chart?

x	2	5	8	11	☐	17	20	23
y	2	11	20	29	38	47	56	65

a. 12   c. 14
b. 13   d. 15

____ 46. The following chart shows distance over time. What linear relation represents these data?

Time (hours)	1	2	3	4	5	6	7	8
Distance (km)	90	180	270	360	450	540	630	720

a. $d = 90(t)$ c. $d = t + 90$
b. $d = 180(t) - 90$ d. $d = 90(t) + 90$

_____ 47. The following chart shows distance over time. What is the missing distance?

Time (hours)	1	2	3	4	5	6	7	8
Distance (km)	90	180	270	360	450	▢	630	720

a. 470   c. 570
b. 540   d. 610

_____ 48. Which graph is best described by the linear relation $y = -x + 3$?

a.

c.
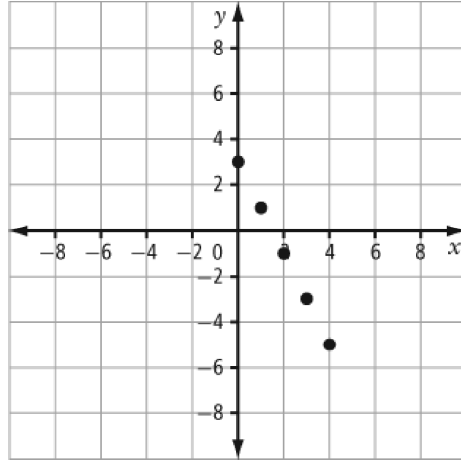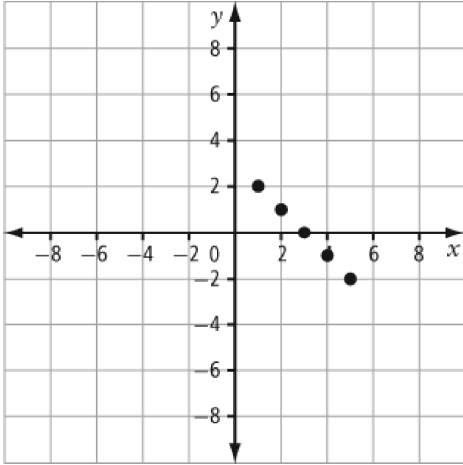
b.

d.

_____ 49. Which graph is best described by the linear relation $y = -2x - 3$?

a.
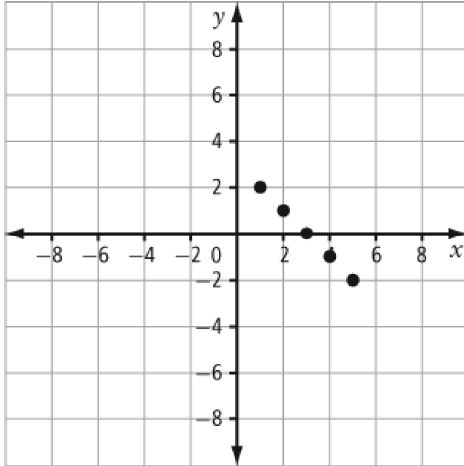
c.
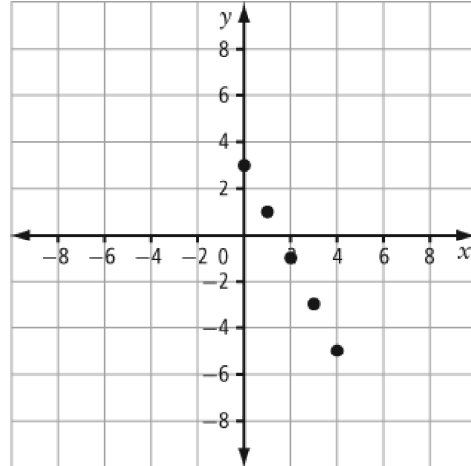
b.
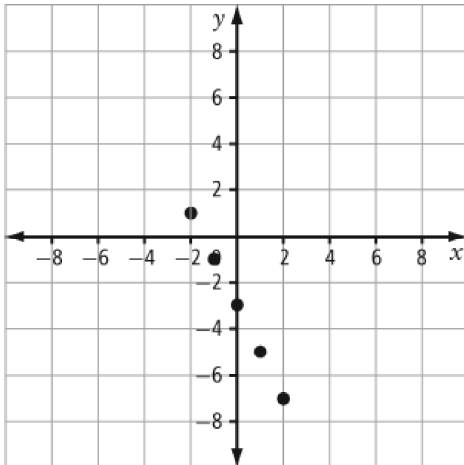
d.
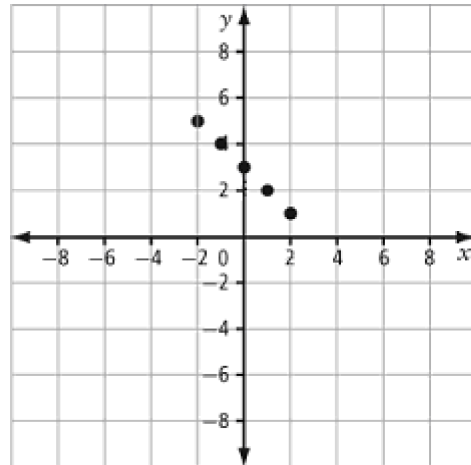
_____ 50. Esteban deposited $1 into his bank acount on the first day. The next day he deposited $2; on the third day he deposited $4. The table below sh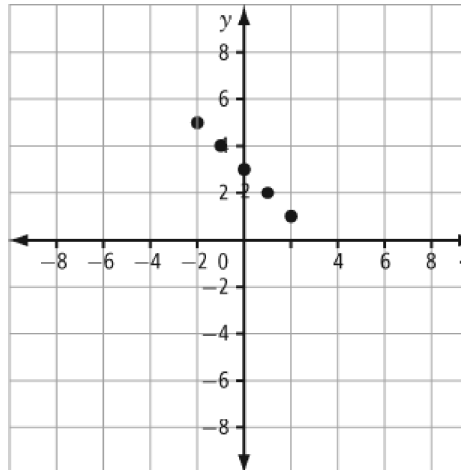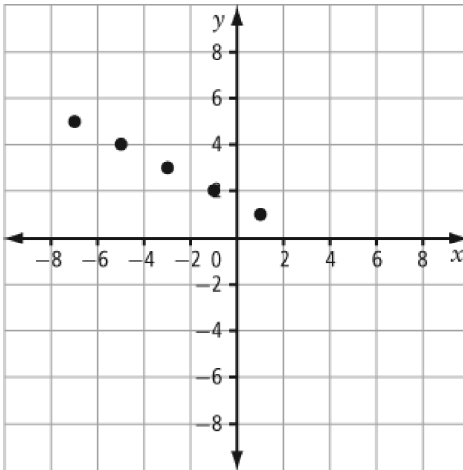ows the total amounts in the account after the first 10 deposits. What pattern do these totals show compared to the amount of money deposited in the account on that day?

Day	1	2	3	4	5	6	7	8	9	10
Total Amount in the Account ($)	1	3	7	15	31	63	127	255	511	1023

a. The totals are double the day's deposit.
b. The totals are $1 less than double the day's deposit.
c. The totals are more than double the day's deposit.
d. The totals are half the day's deposit.

____ 51. Esteban deposited $1 into his bank account on the first day. The next day he deposited $2; on the third day he deposited $4. The table shows the amounts of the first 10 deposits. Which ordered pair is the next entry in the table?

| Day	1	2	3	4	5	6	7	8	9	10
Total Amount in the Account ($)	1	2	4	8	16	32	64	128	256	512

a. (11, 513)   c. (11, 1024)
b. (11, 988)   d. (11, 1210)

Completion
Complete each statement.

  Write your answer in the space provided.

52. Andy was given these coordinates: (2, 5), (3, 10), (4, 15), (5, 20). He determined that this is a
   _____ relation.

53. Complete Hussein's statement about the following coordinates: (0, 4), (1, 8), (2, 12), (3, 16). "Whenever the
   x-value increases by one, the y-value increases by _____."

54. A linear relation has this set of (x, y) ordered pairs: (3, 0), (4, 1), (5, 2), (6, 3). An equation showing the
   relationship between the variable is _____.

55. The vertical axis on a grid is called the _____.

56. The first number in an ordered pair is called the _____.

57. A _____ is a chart showing two sets of related numbers.

58. A pattern made by a set of points that lie in a straight line is called a(n) _____.

59. A(n) _____ is a mathematical statement with two expressions of equal value that are
   separated by an equal sign.

60. A(n) _____ is a pattern formed by two sets of numbers.

61. In the expression $2x + 3$, the variable is _____.

Matching

Match the correct term to each of the following definitions. A term may be used more than once or not at all.

a. equation
b. expression
c. formula
d. linear relation

e. relationship
f. table of values
g. variable

_____ 62. any single number or variable, or combination of operations involving numbers and variables, such as $2x + 4$

_____ 63. a mathematical statement that represents the relationship between specific quantities, such as $A = l \times w$

_____ 64. a chart showing two sets of related numbers

_____ 65. a letter, such as b, that represents an unknown quantity

_____ 66. a pattern made by a set of points that lie in a straight line

Match the point on the relation with the corresponding coordinates.

a. A
b. B
c. C

d. D
e. E
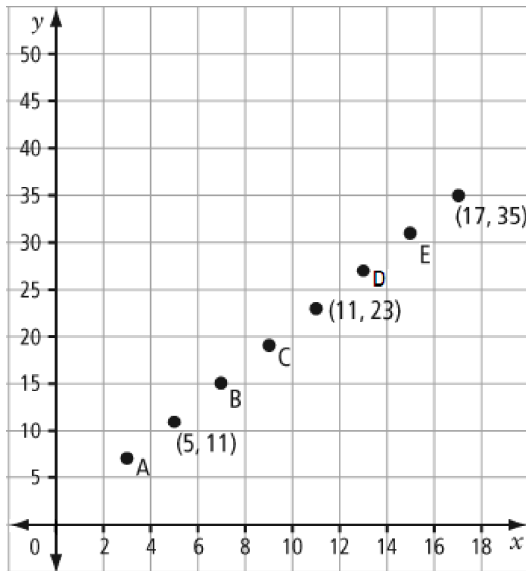
_____ 67. (13, 27)

_____ 68. (7, 15)

_____ 69. (3, 7)

_____ 70. (15, 31)

_____ 71. (9, 19)

Linear Relations Review
Answer Section

MULTIPLE CHOICE

    1. A
    2. B
    3. C
    4. A
    5. C
    6. D
    7. B
    8. A
    9. B
  10. D
  11. B
  12. C
  13. C
  14. C
  15. A
  16. B
  17. B
  18. A
  19. C
  20. D
  21. B
  22. B
  23. C
  24. B
  25. D
  26. C
  27. C
  28. A
  29. B
  30. C
  31. D
  32. C
  33. A
  34. C
  35. B
  36. C
  37. B
  38. A
  39. B

40. C
41. D
42. B
43. A
44. C
45. C
46. A
47. B
48. A
49. B
50. B
51. C

COMPLETION

52. linear
53. four
54. $y = x - 3$
55. y-axis
56. x-coordinate
57. table of values
58. linear relation
59. equation
60. relationship
61. x

MATCHING

62. B
63. C
64. F
65. G
66. D

67. D
68. B
69. A
70. E
71. C