

Assessment Title: Multiple Representations of Functions Cards
Unit 5: Modeling and Comparing Functions

Teacher Directions:

1. There are several different ways in which these cards can be used. Complete assessments for *Multiple Representations of Functions Spoons Game* and *Identifying Functions Game* have been provided.

To create decks for *Multiple Representations of Functions Spoons Game*:

- a. Cards #1-52 for Deck 1
- b. Cards #53-104 for Deck 2
- c. For larger groups, all 104 cards can be used as one deck

To create for *Identifying Functions Game*:

- a. Cards #1-13, #66-78, #27-39, #92-104 for Deck 1
- b. Cards #53-65, #14-26, #79-91, #40-52 for Deck 2
- c. Shuffle each group of cards separately before putting them into the decks
- d. NOTE: Be sure to keep each type of representation together and order as follows:
 - a. Equation
 - b. Graph
 - c. Contextual
 - d. Table of Values

2. Another way these cards can be used is to create a sorting activity. Students will be given the following categories:

- a. Linear Equation
- b. Linear Graph
- c. Linear Context
- d. Linear Table of Values
- e. Quadratic Equation
- f. Quadratic Graph
- g. Quadratic Context
- h. Quadratic Table of Values
- i. Exponential Equation
- j. Exponential Graph
- k. Exponential Context
- l. Exponential Table of Values

Students will then sort each card into its corresponding category. Teachers may decide the most appropriate way to arrange the decks for this activity with their students in mind.

Assessment Title: Multiple Representations of Functions Cards
Unit 5: Modeling and Comparing Functions

Answer Key:

- | | | |
|-----------------|-----------------|------------------|
| 1. Linear | 36. Linear | 71. Quadratic |
| 2. Linear | 37. Linear | 72. Exponential |
| 3. Linear | 38. Linear | 73. Exponential |
| 4. Linear | 39. Quadratic | 74. Linear |
| 5. Linear | 40. Exponential | 75. Linear |
| 6. Exponential | 41. Quadratic | 76. Linear |
| 7. Exponential | 42. Exponential | 77. Linear |
| 8. Exponential | 43. Exponential | 78. Linear |
| 9. Quadratic | 44. Quadratic | 79. Quadratic |
| 10. Quadratic | 45. Linear | 80. Quadratic |
| 11. Quadratic | 46. Linear | 81. Linear |
| 12. Exponential | 47. Linear | 82. Linear |
| 13. Quadratic | 48. Exponential | 83. Linear |
| 14. Linear | 49. Linear | 84. Quadratic |
| 15. Linear | 50. Linear | 85. Quadratic |
| 16. Linear | 51. Quadratic | 86. Exponential |
| 17. Linear | 52. Quadratic | 87. Linear |
| 18. Linear | 53. Linear | 88. Linear |
| 19. Exponential | 54. Linear | 89. Exponential |
| 20. Exponential | 55. Linear | 90. Exponential |
| 21. Exponential | 56. Linear | 91. Quadratic |
| 22. Quadratic | 57. Linear | 92. Linear |
| 23. Quadratic | 58. Exponential | 93. Linear |
| 24. Quadratic | 59. Exponential | 94. Exponential |
| 25. Exponential | 60. Quadratic | 95. Exponential |
| 26. Quadratic | 61. Quadratic | 96. Quadratic |
| 27. Linear | 62. Quadratic | 97. Quadratic |
| 28. Linear | 63. Quadratic | 98. Quadratic |
| 29. Exponential | 64. Exponential | 99. Quadratic |
| 30. Exponential | 65. Quadratic | 100. Exponential |
| 31. Exponential | 66. Quadratic | 101. Quadratic |
| 32. Quadratic | 67. Exponential | 102. Linear |
| 33. Quadratic | 68. Quadratic | 103. Linear |
| 34. Quadratic | 69. Quadratic | 104. Linear |
| 35. Exponential | 70. Quadratic | |

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Unit 5: Modeling and Comparing Functions

1

$$y = \frac{1}{3}x + \frac{5}{3}$$

36

Danny bought 5 new baseball trading cards to add to his collection. The next day his dog ate two thirds of his collection. How many cards did Danny start with?

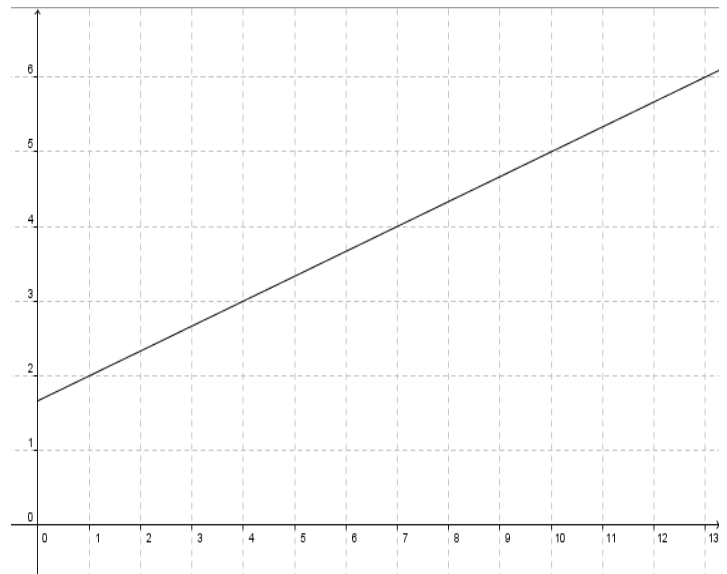
x represents # of trading cards Danny started with

y represents # of trading cards Danny now has

45

x	y
1	2
4	3
7	4
10	5
13	6

14



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Unit 5: Modeling and Comparing Functions

53

$$y = \frac{1}{2}x + 9$$

83

Jose spent half of his allowance going to the movies. He washed the family car and earned 9 dollars. How much money does Jose now have?

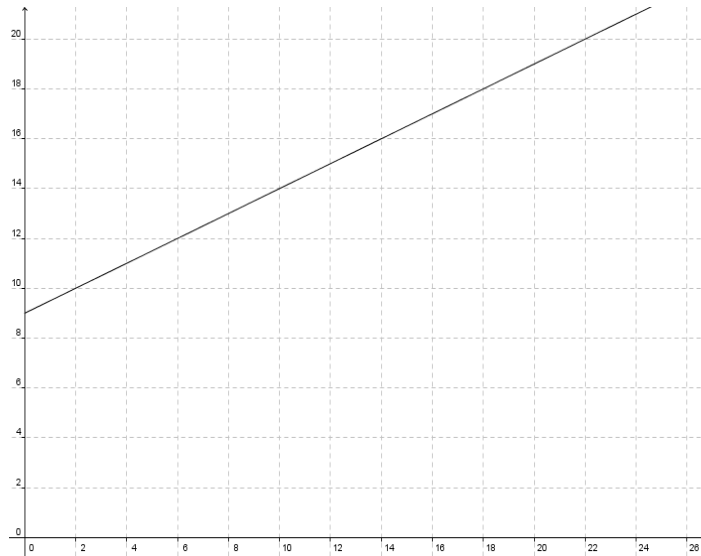
x represents Jose's weekly allowance

y represents amount Jose has now

102

x	y
2.00	10.00
4.00	11.00
5.00	11.50
8.00	13.00
9.50	13.75

78



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Unit 5: Modeling and Comparing Functions

2

$$y = 9x + 5$$

37

On Monday, some students went on a trip to the park. 9 buses were filled, and 5 students traveled in cars. How many students went on the trip?

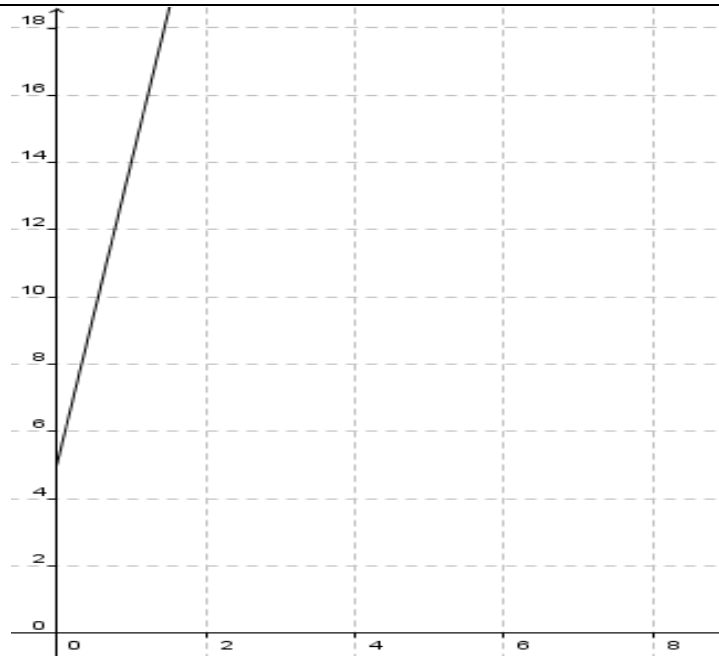
x represents number of students on bus

y represents total number of students that went on the trip

46

x	y
30	275
35	320
40	365
45	410
50	455

15



Assessment Title: Multiple Representations of Functions Cards
Unit 5: Modeling and Comparing Functions

54

$$y = 3x + 3$$

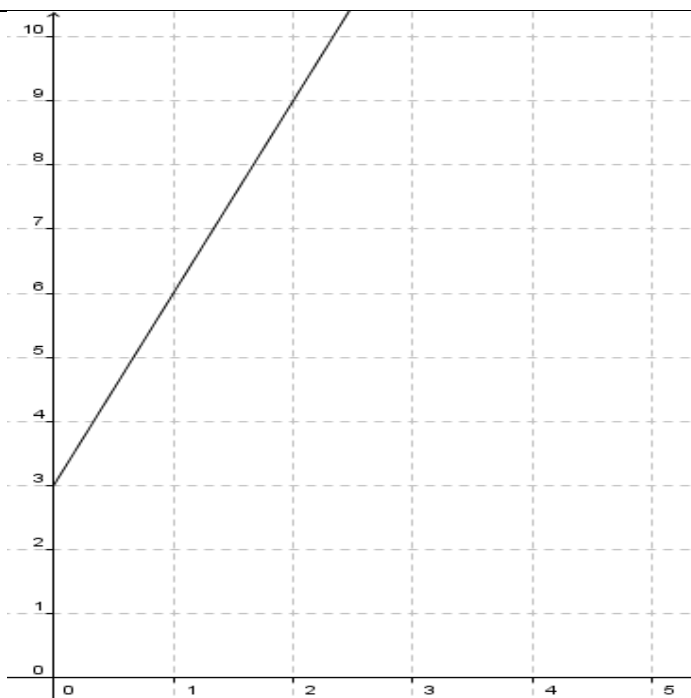
82

The sum of three consecutive numbers is represented by y and the first number is represented by x . What is the sum of the numbers?

103

x	y
3	12
5	18
7	24
9	30
11	36

77



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Unit 5: Modeling and Comparing Functions

3

$$y = 15x + 150$$

38

Oceanside Boat Rentals charges 150 dollars plus 15 dollars an hour for renting a boat. Find the total charges for renting a boat.

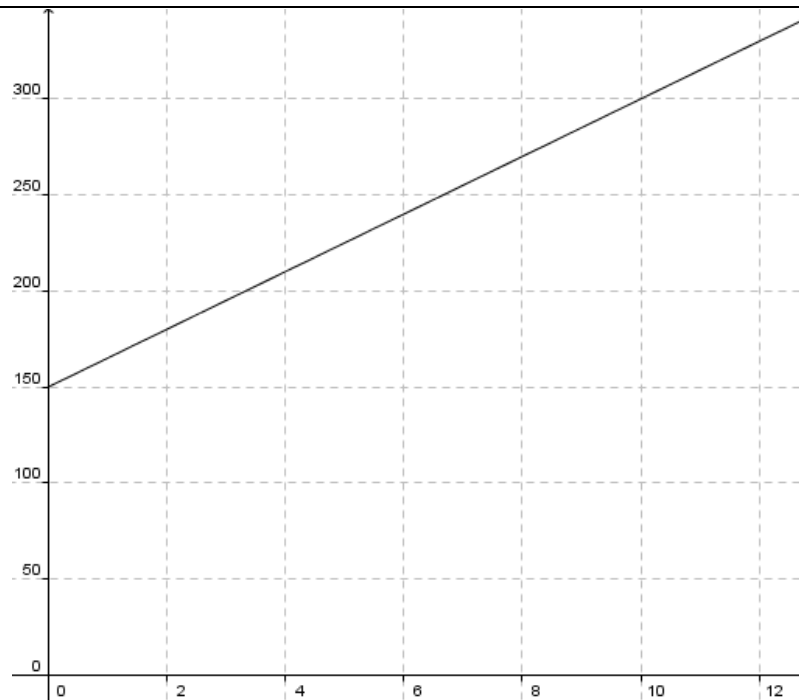
x represents hours rented

y represents total charge for renting a boat

49

x	y
1	165
2	180
3	195
4	210
5	225

16



Assessment Title: Multiple Representations of Functions Cards
Unit 5: Modeling and Comparing Functions

55

$$y = 7x + 2$$

88

Kayla bought a soft drink for 2 dollars and 7 candy bars. How much did she spend?

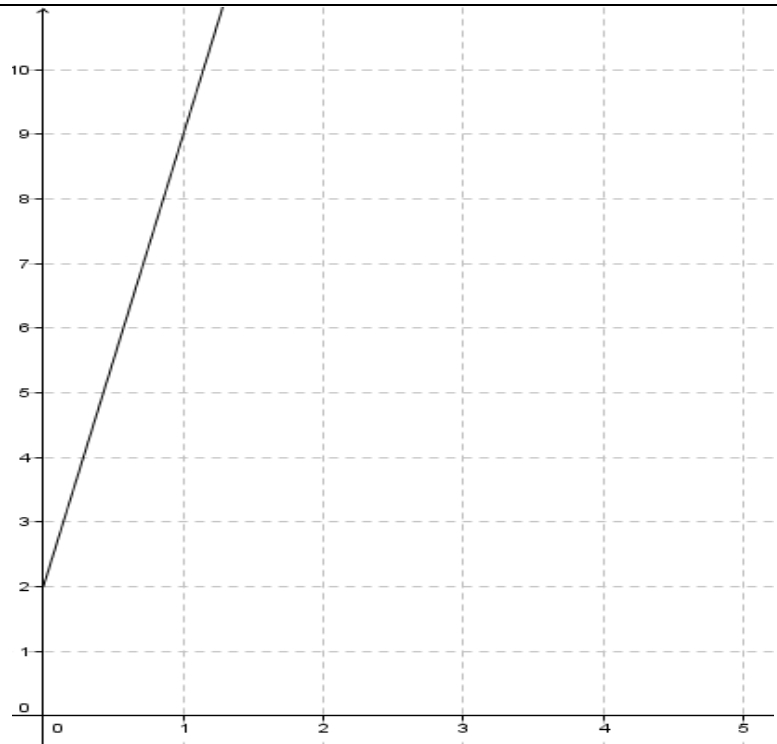
x represents the cost of a candy bar

y represents how much Kayla spent in total

104

x	y
.25	3.75
.50	5.50
.75	7.25
1.00	9.00
1.50	12.50

76



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Unit 5: Modeling and Comparing Functions

4

$$y = \frac{1}{2}x + 7$$

27

Kelly sold half of her comic books and then bought 7 more. How many comic books does she have?

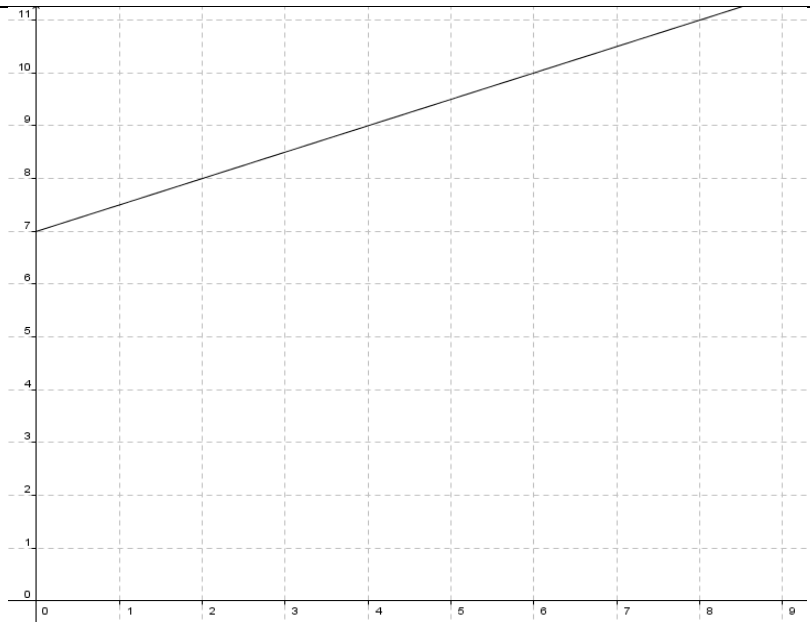
x represents the number of comic books she sold

y represents the number of comic books she now has

47

x	y
10	12
20	17
30	22
40	27
50	32

17



Assessment Title: Multiple Representations of Functions Cards
Unit 5: Modeling and Comparing Functions

56

$$y = 3x + 6.$$

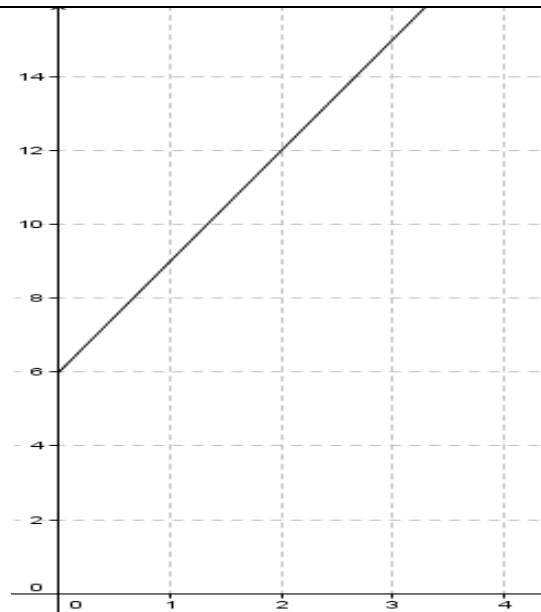
87

Milo is finding the sum of three consecutive even numbers. The first number is represented by x . The sum of the numbers is represented by y . Find the sum of the numbers

92

x	y
2	12
4	18
6	24
8	30
10	36

75



Assessment Title: Multiple Representations of Functions Cards
Unit 5: Modeling and Comparing Functions

5

$$y = 2x + 2$$

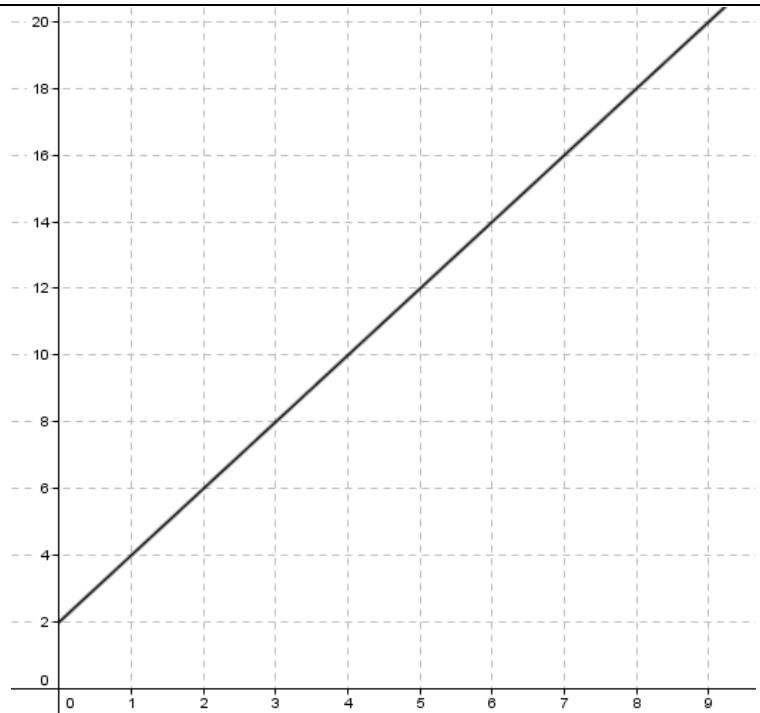
28

Kent finds the sum of two consecutive odd numbers. The first number is represented by x . The sum of the numbers is represented by y . What is the smallest of the three numbers?

50

x	y
2	6
4	10
6	14
8	18
10	22

18



Assessment Title: Multiple Representations of Functions Cards
Unit 5: Modeling and Comparing Functions

57

$$y = 82 - 9x$$

81

Carlota had 82 dollars to spend on 9 equally priced books. After buying the books how much money did she have left?

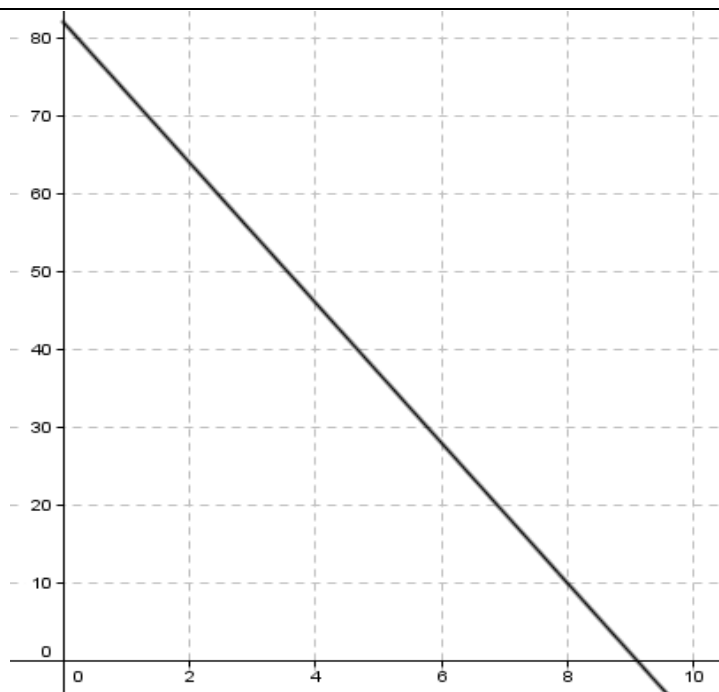
x represents the cost per book she bought

y represents the amount of money she had left

93

x	y
1	73
2	64
3	55
4	46
5	37

74



Assessment Title: Multiple Representations of Functions Cards
Unit 5: Modeling and Comparing Functions

6

$$y = 600 \left(1 + \frac{0.05}{4}\right)^{4x}$$

29

Ivan decided to invest his \$600 tax refund rather than spending it. He found a bank that would pay him 5% interest, compounded quarterly. If he deposits the entire \$600 and does not deposit or withdraw any other amount, how much money is in the account?

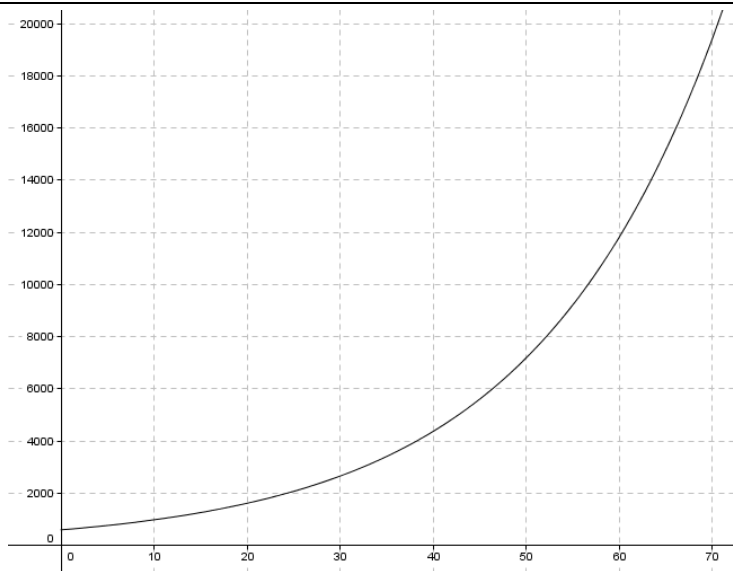
x represents the number of years the money is invested

y represents the amount he has in the account

48

x	y
1	630.57
2	662.69
3	696.45
4	731.93
5	769.22

19



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Unit 5: Modeling and Comparing Functions

58

$$y = 300 \left(\frac{1}{2} \right)^{\frac{x}{5720}}$$

89

The half-life of carbon-14 is known to be 5720 years. Doctor Who has 300 grams of carbon-14 in his experimental laboratory. If untouched, how many of the 300 grams will remain?

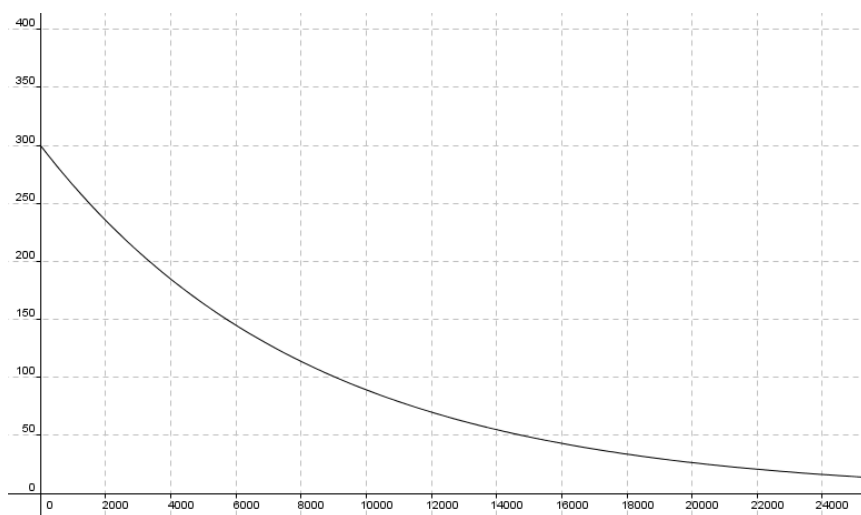
x is the amount of time

y is the number of grams remaining

94

x	y
100	296.39
200	292.82
300	289.29
400	285.81
500	282.36

73



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7

$$y = 2^x$$

30

Your sister tells you a secret. You see no harm in telling two friends. After this second "passing" of the secret, 4 people now know the secret (your sister, you and two friends). If each of these friends now tells two new people, after the third "passing" of the secret, eight people will know. If this pattern of spreading the secret continues, how many people will know the secret?

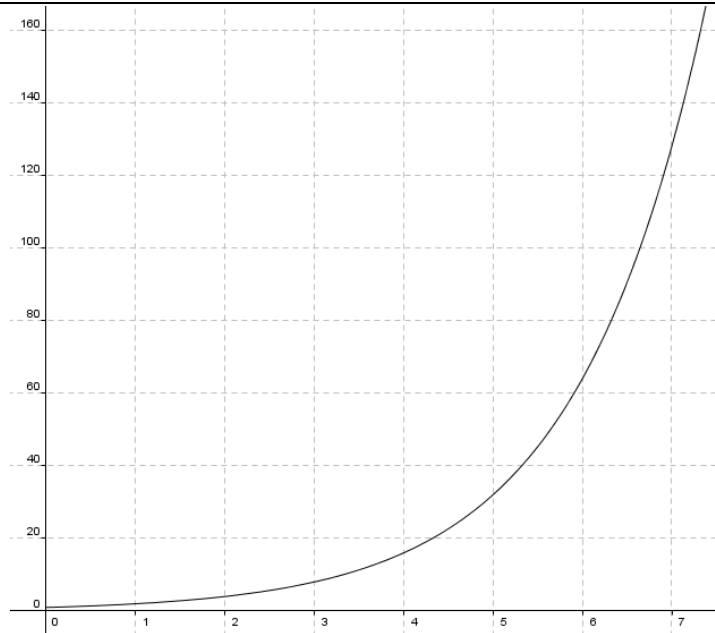
x represents the number of times the secret was passed

y represents the number of people that know the secret

43

x	y
1	2
2	4
3	8
4	16
5	32

20



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59

$$y = 100 \left(\frac{1}{2} \right)^{\frac{x}{138}}$$

86

The radioactive element polonium-210 has a half-life of 138 days. If you have 100 micrograms of polonium-210, how much polonium will remain over time?

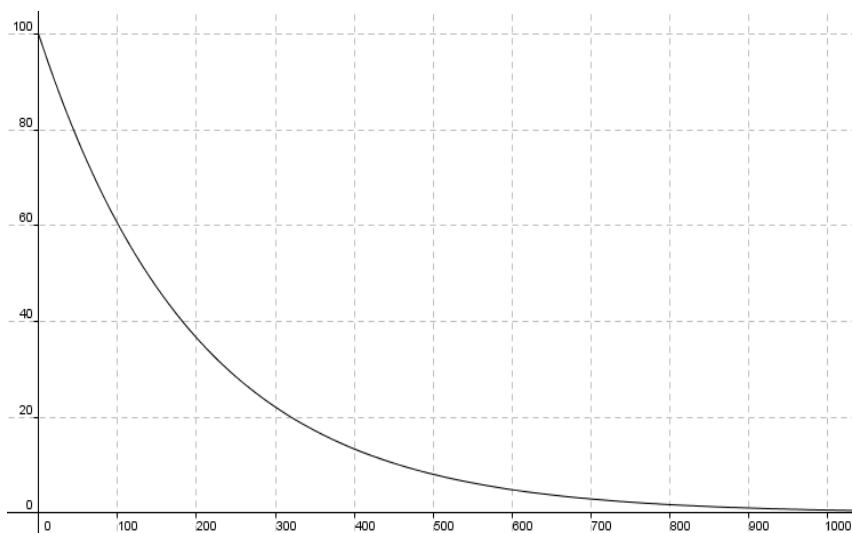
x represents the amount of time

y represents the amount of polonium remaining

95

x	y
10	95.101
20	90.442
30	86.012
40	81.798
50	77.791

72



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8

$$y = 80(1 - .035)^x$$

31

The number of wolves in the wild in the northern section of the Cataragas county is decreasing at the rate of 3.5% per year. Your environmental studies class has counted 80 wolves in the area. If this rate continues, how many wolves will remain?

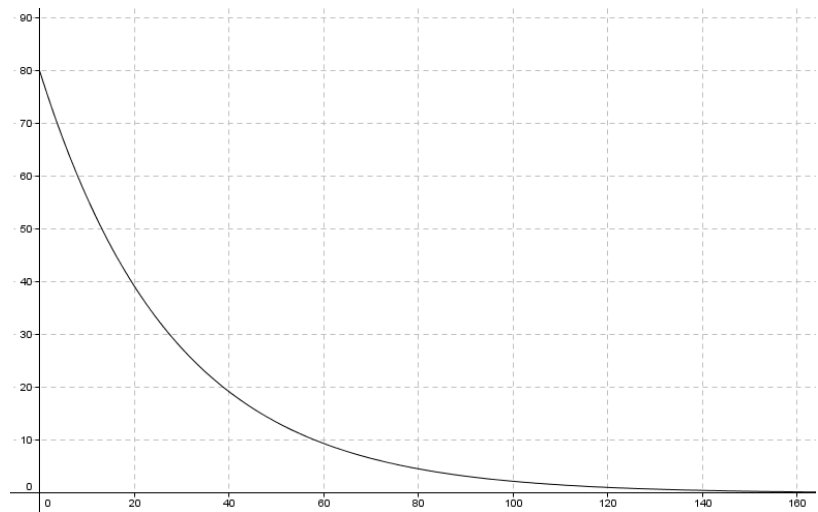
x represents time

y represents number of wolves remaining

42

x	y
1	77.2
2	74.498
3	71.891
4	69.374
5	66.946

21



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60

$$y = (5 + x)(6 + x)$$

80

Tabitha's rectangular garden is 5 meters long and 6 meters wide. She wishes to increase the area of his garden by increasing its length and width by the same amount. Find the number of meters by which each dimension must be increased to obtain a larger area.

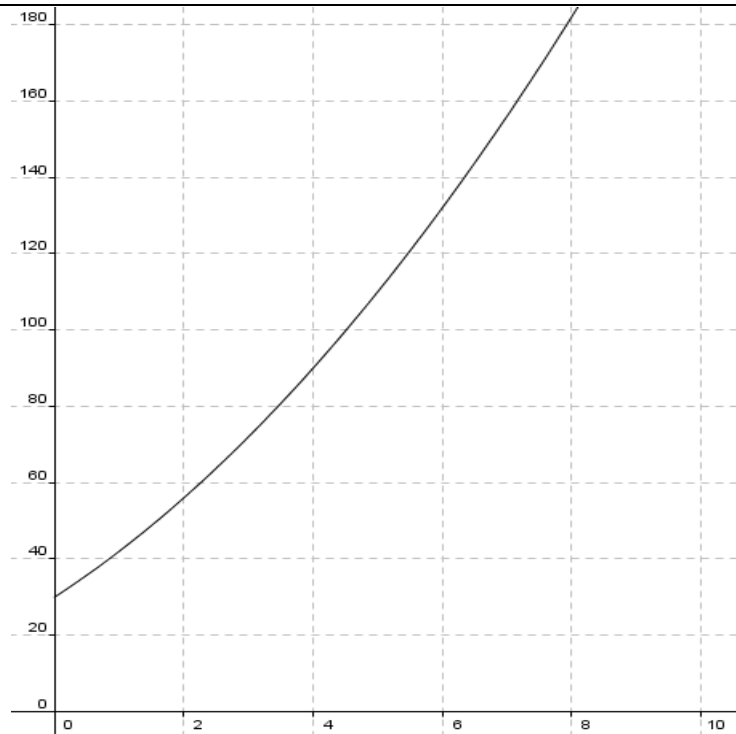
x represents the increase in dimensions

y represents the area

96

x	y
1	42
2	56
3	72
4	90
5	110

71



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Unit 5: Modeling and Comparing Functions

9

$$y = \frac{x(x-5)}{2}$$

32

The altitude of a triangle is 5 less than its base. Find the area of the triangle.

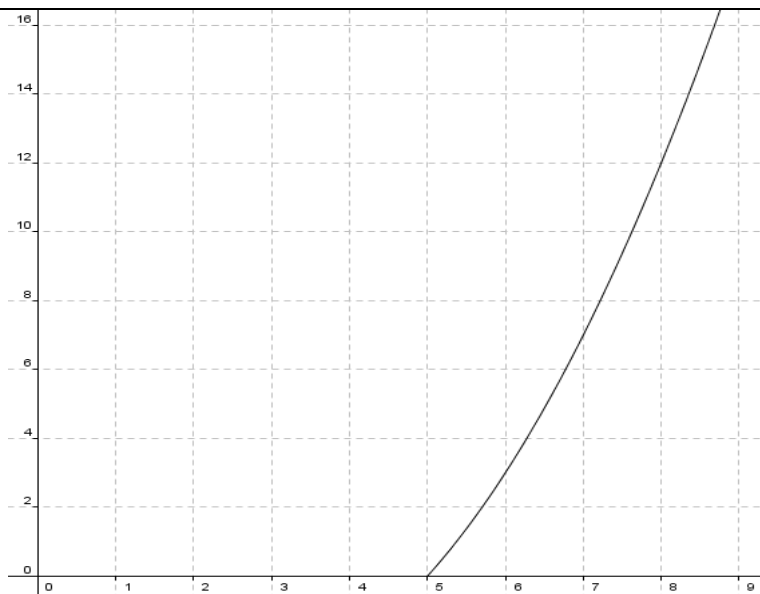
x represents the length of the base of the triangle

y represents the area of the triangle

51

x	y
6	3
7	7
8	12
9	18
10	25

22



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Unit 5: Modeling and Comparing Functions

61

$$y = (x + 2)(x - 2)$$

85

If the measure of one side of a square is increased by 2 centimeters and the measure of the adjacent side is decreased by 2 centimeters, find the area of the resulting rectangle.

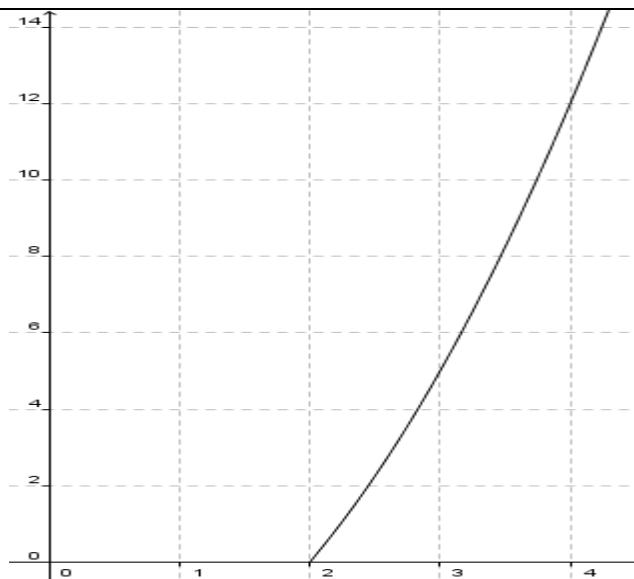
x represents the length of the side of the square

y represents the area of the resulting rectangle

97

x	y
3	5
4	12
5	21
6	32
7	45

70



Assessment Title: Multiple Representations of Functions Cards
Unit 5: Modeling and Comparing Functions

10

$$y = \frac{(x + 3 + x - 5)x}{2}$$

33

In a trapezoid, the larger base is 3 more than the height, the smaller base is 5 less than the height. Find the area of the trapezoid.

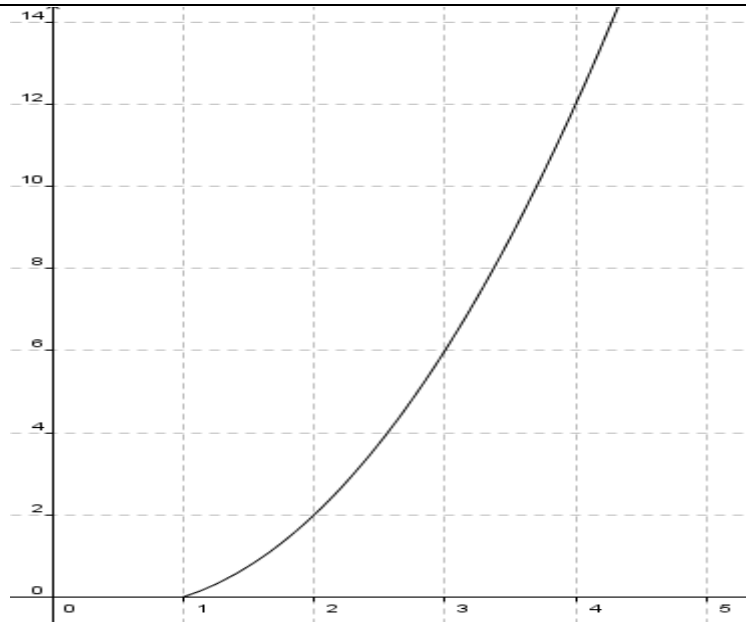
x represents the height of the trapezoid

y represents the area of the trapezoid

41

x	y
2	2
3	6
4	12
5	20

23



Assessment Title: Multiple Representations of Functions Cards
Unit 5: Modeling and Comparing Functions

62

$$y = (3x)(x + 2.5)$$

84

If the length of one side of a square is tripled and the length of an adjacent side is increased by 2.5, find the area of the resulting rectangle.

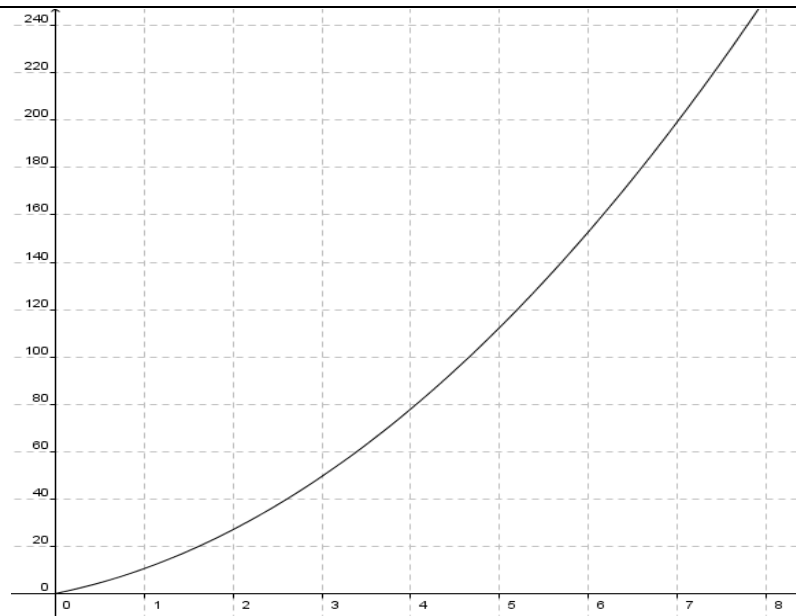
x represents side length of the square

y represents area of resulting rectangle

98

x	y
1	10.5
2	27
3	49.5
4	78
5	112.5

69



Assessment Title: Multiple Representations of Functions Cards
Unit 5: Modeling and Comparing Functions

11

$$y = -x^2 + 160$$

34

Tommy shot a cannon from the top of a 160 ft cliff. Find the height of the cannon ball.

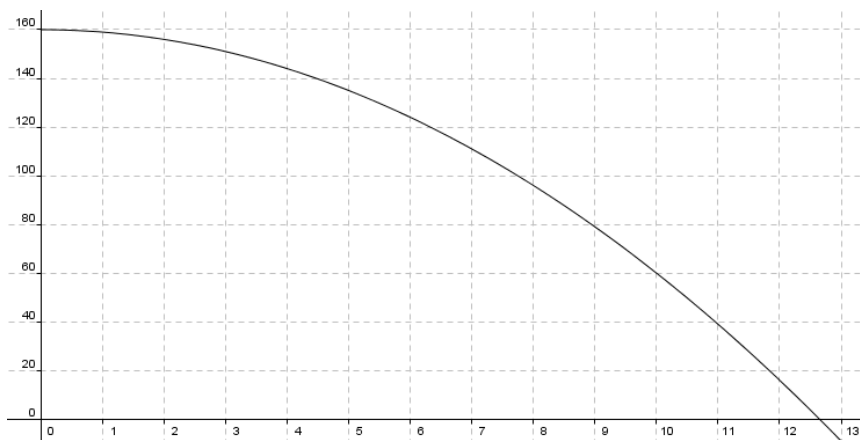
x represents time

y represents the height of the cannon ball

52

x	Y
0	160
1	159
2	156
3	151
4	144

24



Assessment Title: Multiple Representations of Functions Cards
Unit 5: Modeling and Comparing Functions

63

$$y = -x^2 + 22$$

79

Melika tossed an egg from her apartment window at a height of 22 feet.
Find the height of the egg for a given time.

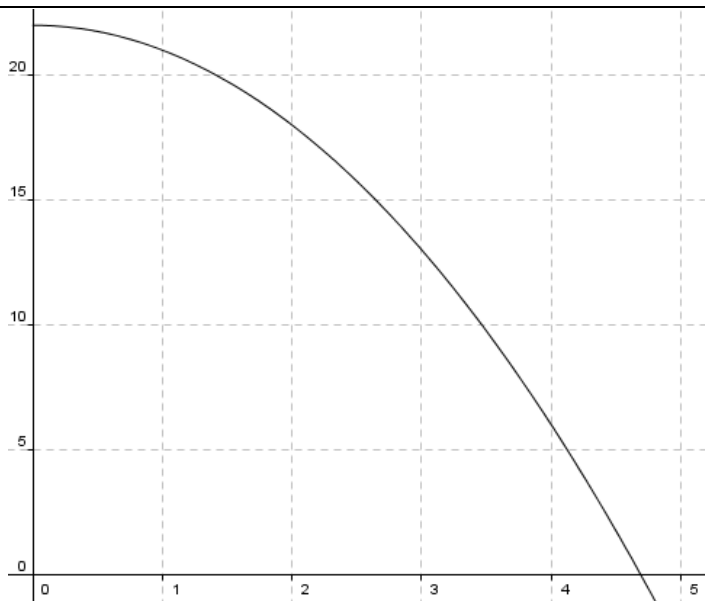
x represents time

y represents height of egg

99

x	y
0	21
1.5	19.75
2	18
2.5	15.75
3	13

68



Assessment Title: Multiple Representations of Functions Cards
Unit 5: Modeling and Comparing Functions

12

$$y = 100(1 + .04)^x$$

35

In efforts to increase the bee population in Illinois, Helen began her hobby of beekeeping with an initial population of 100 bees. Her bee population is growing at a rate of 4% each year. Find the total number of bees she has.

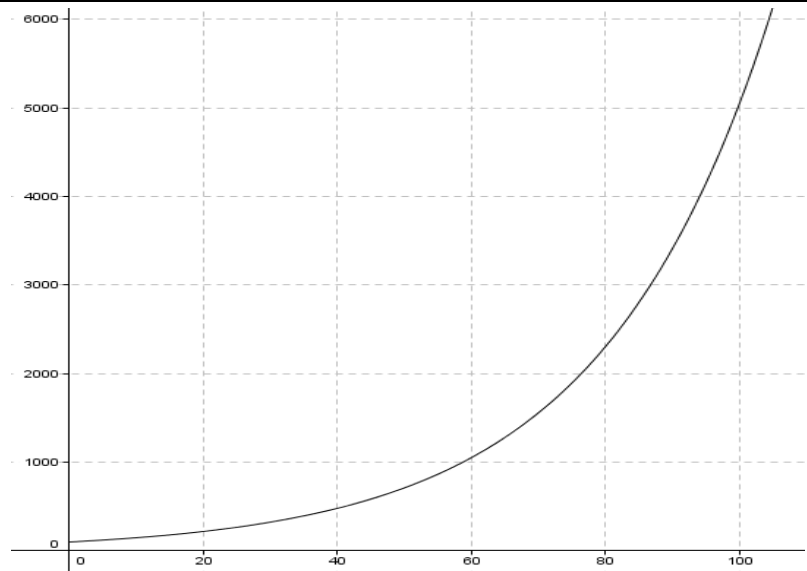
x represents time in years

y represents number of bees

40

x	y
1	104
2	108
3	112
4	117
5	122

25



Assessment Title: Multiple Representations of Functions Cards
Unit 5: Modeling and Comparing Functions

64

$$y = 8,000(1 + .03)^x$$

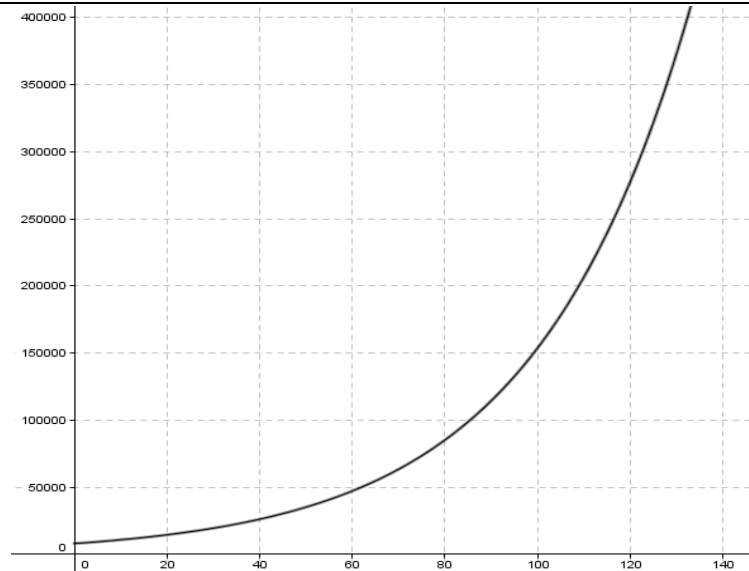
90

A university's tuition started at \$8,000 per year and has since risen 3% each year. Find the university's tuition for a given year past starting if x represents time in years from starting tuition and y represents the tuition.

100

x	y
1	8,240
2	8,487.20
3	8,741.80
4	9,004.10
5	9,274.20

67



Assessment Title: Multiple Representations of Functions Cards
Unit 5: Modeling and Comparing Functions

13

$$y = x(x + 1)$$

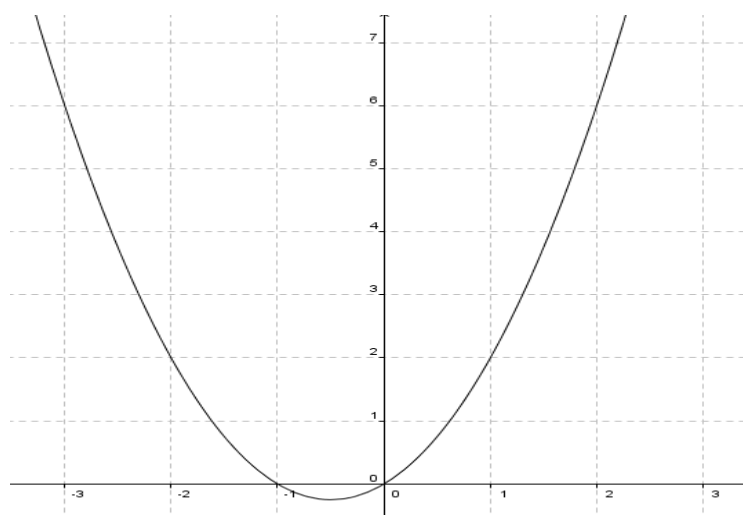
39

Find the product of two consecutive numbers if x represents the smaller number and y represents the product.

44

x	y
-2	2
-1	0
0	0
1	2
2	6

26



Assessment Title: Multiple Representations of Functions Cards
Unit 5: Modeling and Comparing Functions

65

$$y = x(x - 7)$$

91

Cadence is 7 years younger than her brother. Find the product of Cadence's age and her brother age.

x represents her brother's age

y represents the product of Cadence's age and her brother's age

101

x	y
8	8
9	18
10	30
11	44
12	60

66

