

Algebra HSA Workbook

Prepare yourself
for the HSA

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1. A rectangular rug is $x + 4$ feet wide and $2x +$ feet long. Which expression represents the area of the rug?

- A. $(x + 4) + (2x + 1)$
- B. $(x + 4) \times (2x + 1)$
- C. $2(x + 4) + 2(2x + 1)$
- D. $2(x + 4) \times (2x + 1)$

2. A company bought equipment for $x^2 + 5x$ dollars. One year later the value of the equipment was $x^2 + 2$ dollars. Which expression represents the amount that the equipment value decreased?

- A. $(x^2 + 5x) - (x^2 + 2)$
- B. $(x^2 + 2) - (x^2 - 5x)$
- C. $(x^2 + 5x) \div (x^2 + 2)$
- D. $(x^2 + 2) \times (x^2 + 5x)$

3. The expression $16x^2 + 28x - 36$ represents the perimeter of a square. Which of these expressions represents the length of one side?

- A. $\frac{16x^2 + 28x - 36}{2}$
- B. $(16x^2 + 28x - 36)^2$
- C. $\sqrt{16x^2 + 28x - 36}$
- D. $\frac{16x^2 + 28x - 36}{4}$

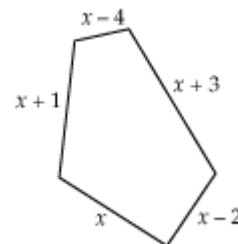
4. In one day, a store sold 300 shirts at 25% off the regular price of x dollars. Which of these expressions represents the total amount, in dollars, that was received for the sale of shirts on that day?

- A. $0.25(x - 300)$
- B. $25(x - 300)$
- C. $300(x - 25)$
- D. $300(x - 0.25x)$

5. A drawing of the swimming pool at Buckwood Camp is shown at right.

Which of these expressions represents the perimeter of the pool?

- A. $x + (x + 1) + (x - 4) + (x + 3) + (x - 2)$
- B. $x - (x + 1) - (x - 4) - (x + 3) - (x - 2)$
- C. $(x)(x)(x)(x)(x) + (1 - 4 + 3 - 2)$
- D. $x(x + 1)(x - 4)(x + 3)(x - 2)$



6. The state sales tax rate in Maryland is 5%. What is the total price of an item that costs x dollars?
- A. $0.05x$
 - B. $x + 0.05$
 - C. $x + 0.05x$
 - D. $0.5x$

7. Barbara has x dollars to spend. Joe has $2x + 3$ dollars to spend. Which of these expressions represents the total amount of money Barbara and Joe have to spend?

- A. $(2x + 3) + x$
- B. $(2x + 3) - x$
- C. $x(2x + 3)$
- D. $(2x + 3) \div x, x \neq 0$

8. A gas and electric bill totals \$324.86. If x represents the charge for electricity, which of these expressions represents the charge for gas?

- A. $\$324.86x$
- B. $\$324.86 + x$
- C. $\$324.86 - x$
- D. $\$324.86 / x$

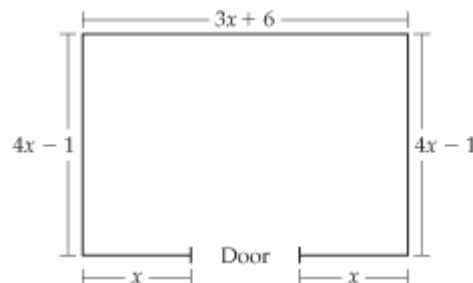
9. At a movie theater, the child ticket price is x dollars and the adult price is \$3.50 more. One evening 41 child tickets were sold and 65 adults tickets were sold. Which of these expressions represents the total ticket sales, in dollars?

- A. $41x + 65(x + 3.50)$
- B. $41x + 65x + 3.50$
- C. $41x + 65(3.50)$
- D. $41 + x + 65 + 3.50$

10. Martha is x years old. Esteban is $x + 7$ years old. Martha's mother is $3x + 5$ years old. Which of these expressions represents how much older Martha's mother is than Esteban?

- A. $(x + 7) - x$
- B. $(3x + 5) - x$
- C. $(x + 7) - (3x + 5)$
- D. $(3x + 5) - (x + 7)$

11. A rectangular room is shown below.



Which expression represents the width of the door?

- A. $(3x+6) - x - x$
- B. $(4x-1) - x - x$
- C. $(4x-1) - (3x + 6)$
- D. $(3x + 6) + (4x - 1) + (4x-1) + x + x$

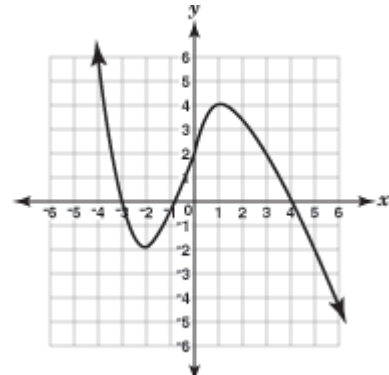
12. Carmen bought n books for a total cost of $13n-5$ dollars. Which expression represents the cost of each book?

- A. $n(13n-5)$
- B. $n + (13n - 5)$
- C. $(13n - 5) \div n; n \neq 0$
- D. $(13n - 5) - n$

13. Look at the function that is graphed to the right.

Which of these represents the number of zeros of this function?

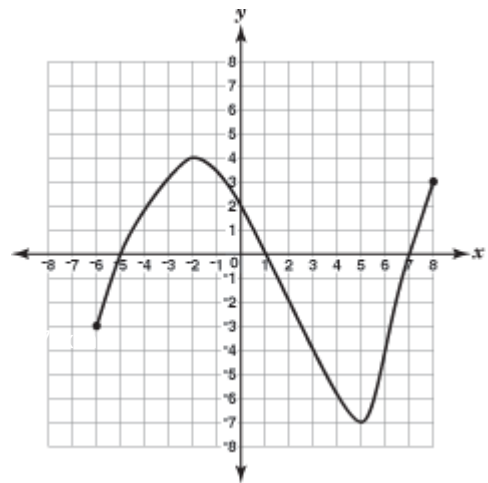
- A. 0
- B. 1
- C. 2
- D. 3



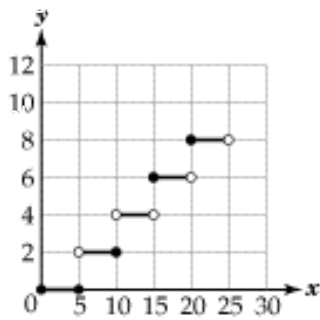
14. Look at the function that is graphed to the right.

What is the range of this function?

- A. $-7 \leq y \leq 4$
- B. $-6 \leq y \leq 8$
- C. $-5 \leq y \leq 7$
- D. $-2 \leq y \leq 5$



15. For the following, enter your answer in the box below.
 Look at the graph below.
 What is the y value when x is 15?

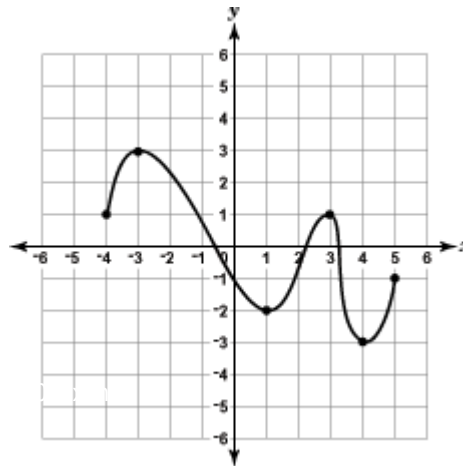


	○	○	○	○
○	○	○	○	○
0	0	0	0	0
1	1	1	1	1
2	2	2	2	2
3	3	3	3	3
4	4	4	4	4
5	5	5	5	5
6	6	6	6	6
7	7	7	7	7
8	8	8	8	8
9	9	9	9	9

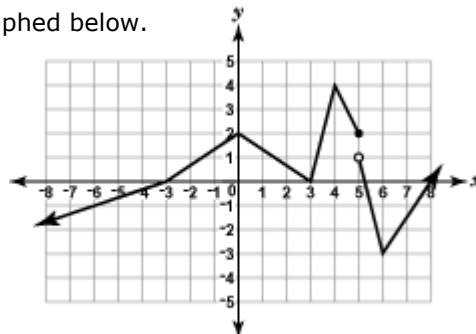
16. Look at the function that is graphed below.

What is the range of this function?

- A. $-4 \leq y \leq 5$
- B. $-3 \leq y \leq 3$
- C. $-2 \leq y \leq 3$
- D. $-4 \leq y \leq -1$



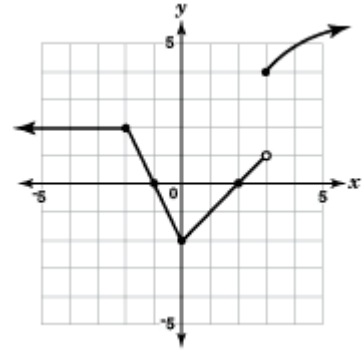
17. Look at the function that is graphed below.



For what value of x is this function not continuous?

- A. 2
- B. 3
- C. 4
- D. 5

18. Look at the graph.



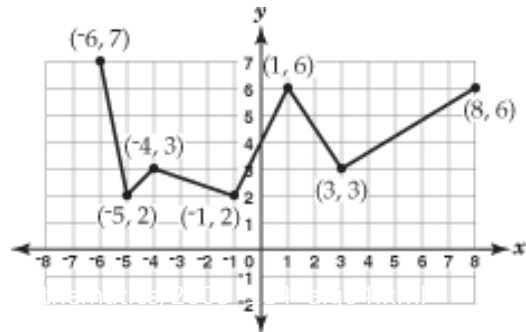
What is the x-value of the point where the graph is not continuous?

- A. -3 B. -2 C. 0 D. 3

19. Look at the function that is graphed.

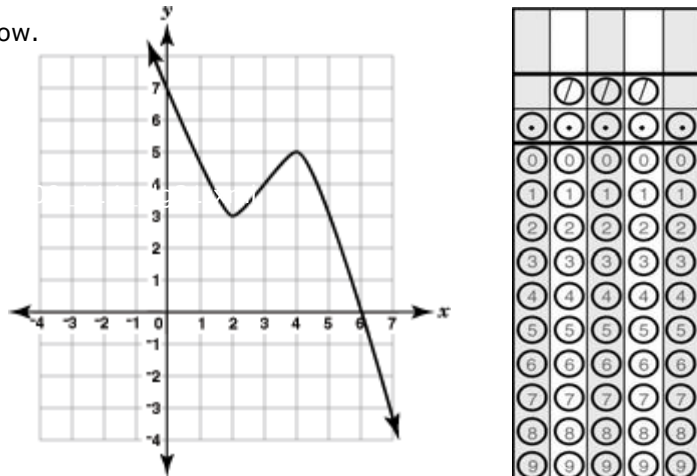
What is the greatest rate of increase of this function?

- A. $\frac{3}{5}$ B. $\frac{3}{2}$
C. 2 D. 5



20. Look at the function that is graphed below.

What is the zero of this function?

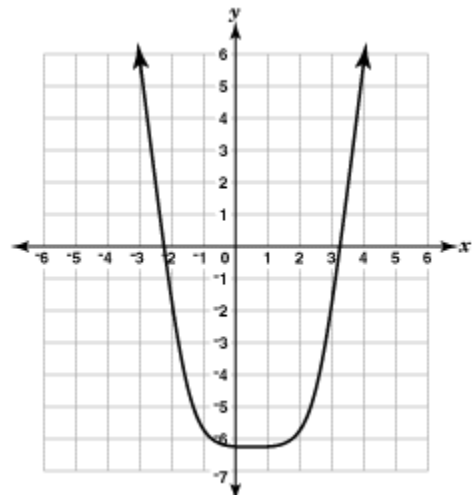


	0	1	2	3
0	0	0	0	0
1	1	1	1	1
2	2	2	2	2
3	3	3	3	3
4	4	4	4	4
5	5	5	5	5
6	6	6	6	6
7	7	7	7	7
8	8	8	8	8
9	9	9	9	9

21. The function $f(x) = x^2 - x - 6$ is graphed on the right.

What are the zeros of this function?

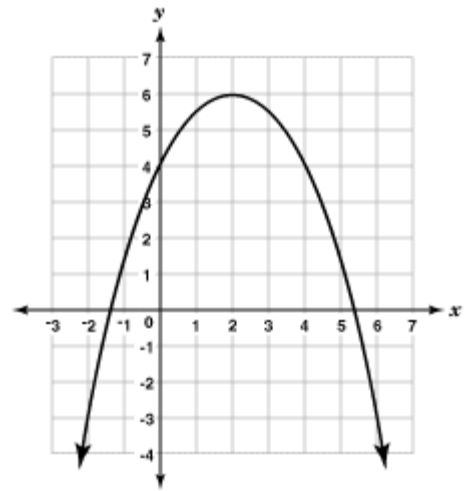
- A. -2 and 3
B. 0 and -6
C. $\frac{1}{2}$ and $-\frac{1}{4}$
D. $-\frac{1}{2}$ and $6\frac{1}{4}$



22. Look at the graph below.

Which of these terms describes the y -coordinate of the point $(2, 6)$?

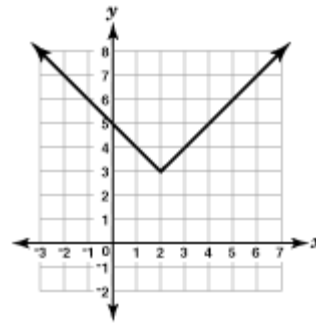
- A. zero
- B. intercept
- C. minimum
- D. maximum



23. Look at the function that is graphed.

Which of these statements about this function is true?

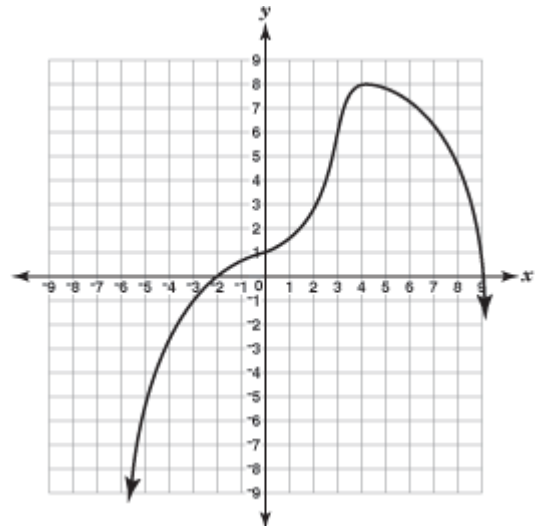
- A. The minimum value is 2.
- B. The minimum value is 3.
- C. The maximum value is 3.
- D. The maximum value is 5.



24. Look at the function that is graphed below.

What is the maximum value of this function?

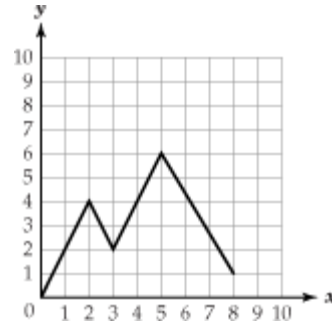
- A. -2
- B. 1
- C. 8
- D. 9



25. Look at the function that is graphed.

What is the domain of this function?

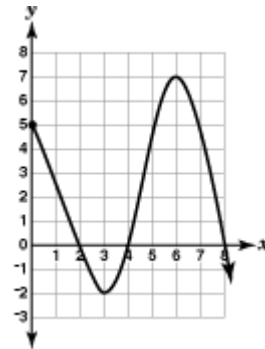
- A. $0 \leq x \leq 5$
- B. $0 \leq x \leq 8$
- C. $0 \leq y \leq 1$
- D. $0 \leq y \leq 6$



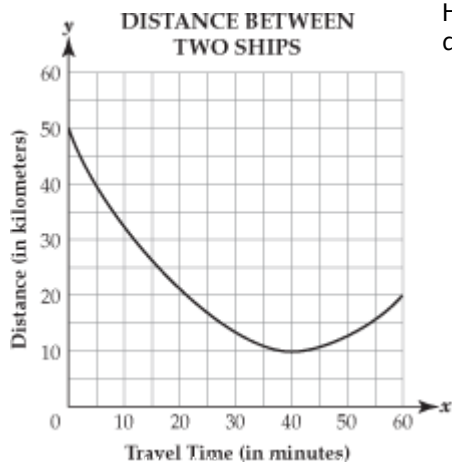
26. Look at the function that is graphed.

What is the maximum value of this function?

- A. 5
- B. 6
- C. 7
- D. 8



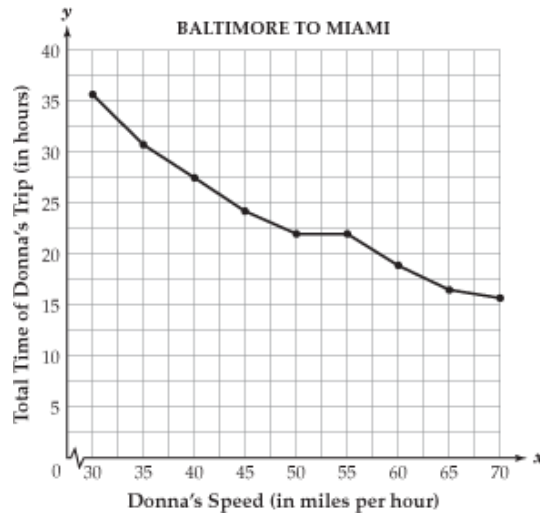
27. Two ships travel in the Chesapeake Bay. The graph below shows the distance between the two ships during the time the ships travel.



How many minutes have the ships traveled when the distance between them is the shortest?

- A. 10 minutes
- B. 20 minutes
- C. 40 minutes
- D. 60 minutes

28. Donna drives from Baltimore to Miami. The total time, in hours, of Donna's trip depends on her speed, in miles per hour. This relationship is shown in the graph below.

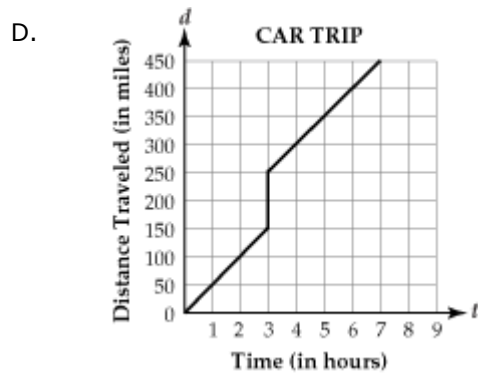
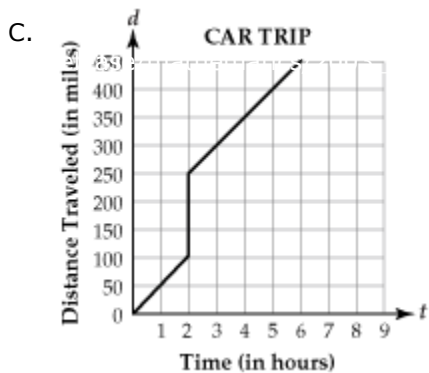
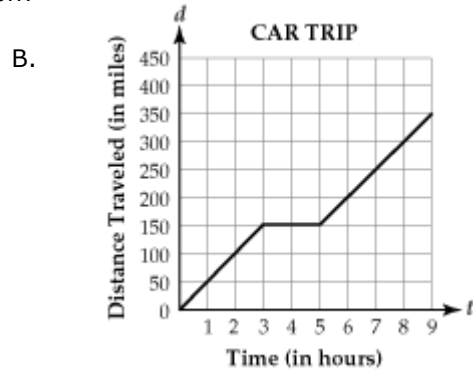
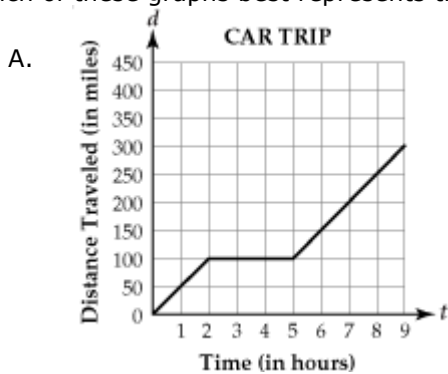


Approximately, how many hours longer does the trip take if Donna drives 55 miles per hour than if she drives 70 miles per hour?

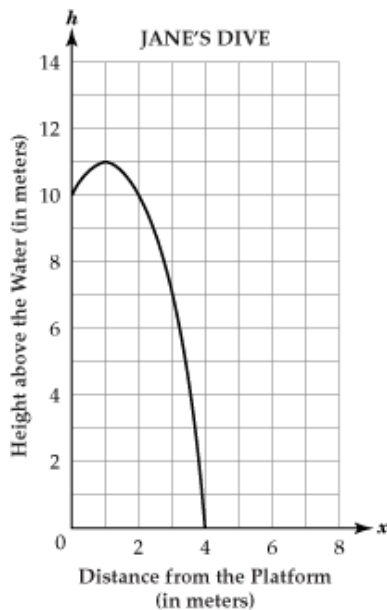
- A. 2
- B. 6
- C. 15
- D. 21

29. A family travels at a constant speed during a road trip. After 3 hours, they stop for 2 hours to eat and rest. They then continue for 4 more hours at the same speed.

Which of these graphs best represents this situation?



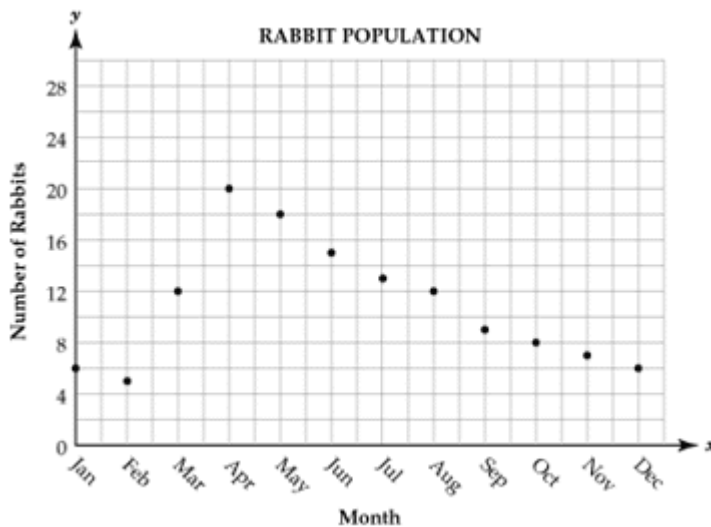
30. Jane dives off a platform into a diving pool. The platform is 10 meters above the water. The graph below shows the relationship between her height above the water and her distance, in meters, from the platform.



How far away from the platform is Jane when she enters the water?

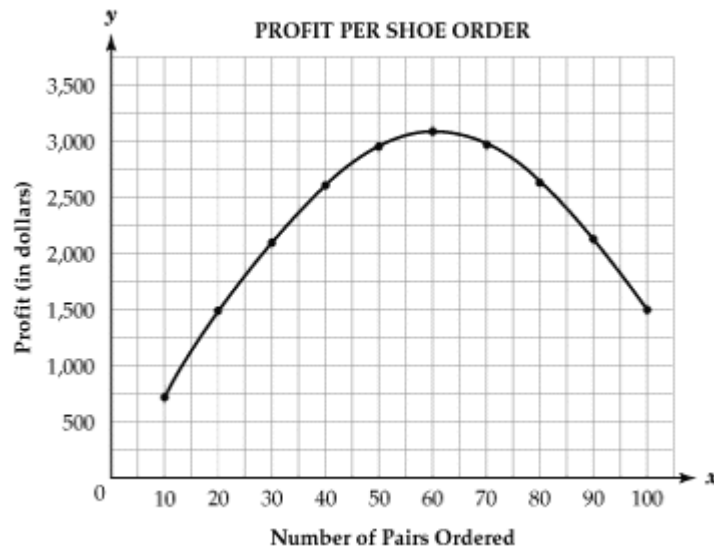
- A. 1 meter B. 4 meters C. 10 meters D. 11 meters

31. The scatter plot below shows the rabbit population in Smith Field during 1998.



What was the minimum rabbit population in Smith Field during 1998?

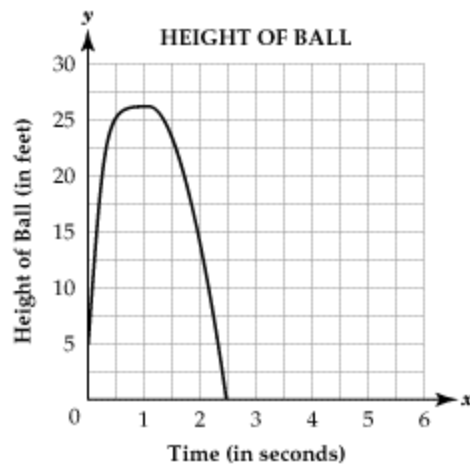
32. The profit that a shoe manufacturer makes is related to the number of pairs of shoes ordered, as shown in the graph below.



How many pairs of shoes must be ordered for the manufacturer to make the greatest profit?

- A. 60
- B. 100
- C. 1,600
- D. 3,100

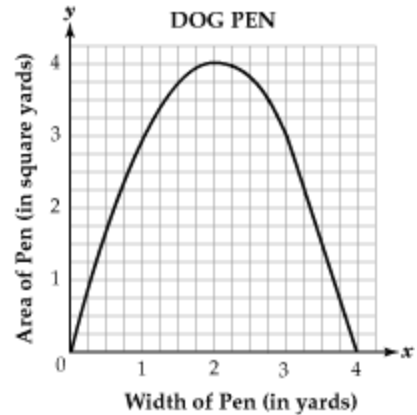
33. Jane threw a ball into the air. The graph below shows the relationship between the number of seconds that the ball was in the air and the height of the ball.



How many seconds after Jane threw the ball did the ball hit the ground?

- A. 1 second
- B. 1.2 seconds
- C. 2.5 seconds
- D. 5 seconds

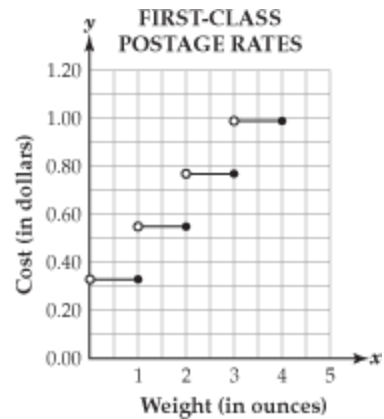
34. Doug makes a rectangular dog pen using 8 yards of fencing. The graph below shows the relationship between the width of the pen and the area of the pen.



In the ordered pair (2, 4), what does the y-coordinate represent?

- A. maximum area of the pen
- B. maximum width of the pen
- C. maximum length of the pen
- D. maximum perimeter of the pen

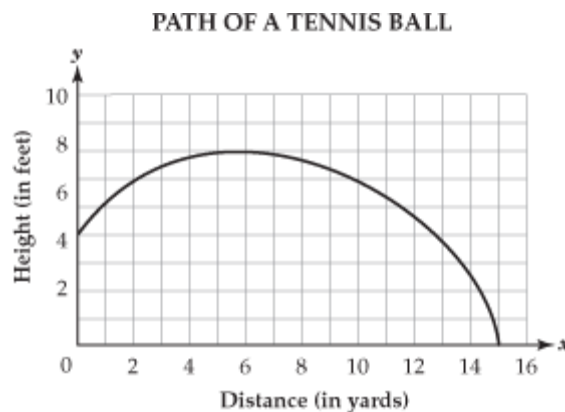
35. In 1999, first-class postage for items that weighed up to one ounce was \$0.33. Each additional ounce (or fraction of an ounce) cost \$0.22 as shown in the graph below.



What was the cost to mail a letter that weighed 2.8 ounces?

- A. \$0.33
- B. \$0.55
- C. \$0.77
- D. \$0.99

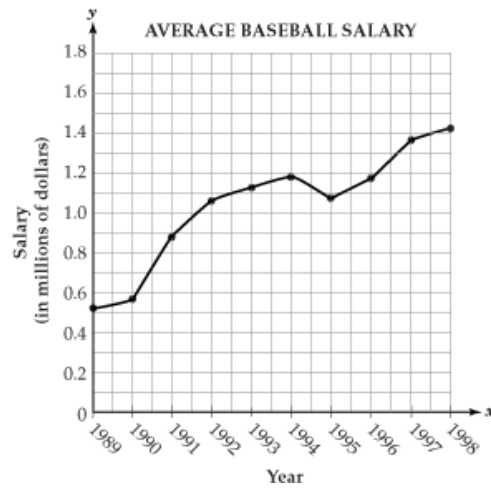
36. The path of a tennis ball follows the curve given in the graph below.



How far does the ball travel horizontally before it hits the ground?

- A. 4 yards
- B. 5 yards
- C. 8 yards
- D. 15 yards

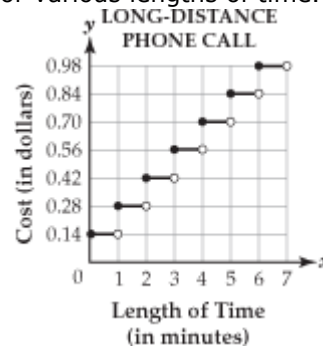
37. The graph below shows the average professional baseball salary from 1989 through 1998.



Based on the graph, between which two years did the average salary have a negative rate of change?

- A. 1989 to 1990
- B. 1992 to 1993
- C. 1993 to 1994
- D. 1994 to 1995

38. The graph below shows the cost of a long-distance telephone call for various lengths of time.



What is the cost of a 5½ - minute long-distance telephone call?

- A. \$0.56
- B. \$0.77
- C. \$0.84
- D. \$0.98

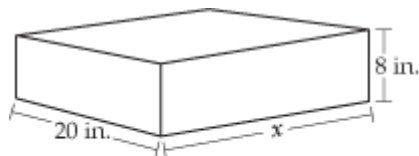
39. Two machines make three different products in three different sizes: small (S), medium (M), and large (L). The matrices below show the number of products each machine makes in one day.

		MACHINE 1			MACHINE 2			
		S	M	L	S	M	L	
Product	1	4	8	0	Product	1	8	3
	2	6	16	10		9	2	6
	3	3	20	6		2	1	12

Which of these matrices represents the number of medium-sized products made by the two machines?

- A.
$$\begin{matrix} & & \text{M} \\ \text{Product} & \begin{bmatrix} 1 & 16 \\ 2 & 18 \\ 3 & 21 \end{bmatrix} \end{matrix}$$
- B.
$$\begin{matrix} & & \text{M} \\ \text{Product} & \begin{bmatrix} 1 & 64 \\ 2 & 32 \\ 3 & 20 \end{bmatrix} \end{matrix}$$
- C.
$$\begin{matrix} & & \text{M} \\ \text{Product} & \begin{bmatrix} 1 & 15 \\ 2 & 18 \\ 3 & 16 \end{bmatrix} \end{matrix}$$
- D.
$$\begin{matrix} & & \text{M} \\ \text{Product} & \begin{bmatrix} 1 & 16 \\ 2 & 32 \\ 3 & 40 \end{bmatrix} \end{matrix}$$

40. The rectangular solid below has a volume of 5,600 cubic inches, a width of 20 inches, and a height of 8 inches.



Note: The figure is not drawn to scale.

What is the length (x) of the rectangular solid?

- A. 20 inches
- B. 35 inches
- C. 200 inches
- D. 280 inches

41. The Class of 1998 sold class shirts in the styles and sizes shown in the matrix below. The Class of 1999 ordered twice the amount of shirts that were sold in 1998.

		CLASS OF 1998 SHIRTS		
		Medium	Large	Extra-Large
Short Sleeve	12	30	37	
Long Sleeve	7	11	23	

What was the total number of extra-large shirts that were ordered by the Class of 1999?

- A. 46
- B. 60
- C. 74
- D. 120

42. The formula below can be used to find the distance (d) traveled by an object, where v represents the initial velocity of the object, t represents the time, in seconds, and a represents the acceleration, in meters per second squared.

$$d = vt + \frac{1}{2}at^2$$

A bicycle traveling at a velocity of 4.5 meters per second accelerates down a hill at a constant rate of 0.4 meters per second squared for 12 seconds. What is the distance, in meters, that the bicycle travels?

43. The Jaguar Soccer Club is joining the Tiger Soccer Club to create a new county soccer program. The enrollment in each of the clubs is shown below.

JAGUAR SOCCER CLUB				
Ages				
	5-7	8-9	10-11	12-14
Boys	58	52	57	48
Girls	37	40	32	28

TIGER SOCCER CLUB				
Ages				
	5-7	8-9	10-11	12-14
Boys	62	60	57	51
Girls	40	41	39	30

What will be the total number of girls in the new county program?

- A. 137
- B. 150
- C. 287
- D. 445

44. While on a business trip to France, Bob felt ill. The hotel manager gave him a thermometer which measured his temperature in degrees Celsius. The thermometer read 38°C . The formula below is used to convert temperatures in degrees Celsius (C) to degrees Fahrenheit (F).

$$F = \frac{9}{5}C + 32$$

What is Bob's temperature in degrees Fahrenheit? Round the answer to the nearest whole number.

- A. 99°F
- B. 100°F
- C. 101°F
- D. 102°F

45. Each day the local music store completes a starting and ending inventory of all cassettes and CDs. The matrices below show the inventory for jazz and rock music on a given day.

STARTING INVENTORY		ENDING INVENTORY			
	Jazz	Rock		Jazz	Rock
Cassettes	129	251	Cassettes	107	225
CDs	214	185	CDs	182	164

Which of these categories showed the largest change from the start of the day to the end of the day?

- A. Jazz cassettes
- B. Rock cassettes
- C. Jazz CDs
- D. Rock CDs

46. The matrices below compare teen consumption of milk and soda in 1978 and 1996.

TEEN CONSUMPTION OF MILK AND SODA
(in ounces per day)

	1978			1996	
	Boys	Girls		Boys	Girls
Milk	16	9	Milk	9	7
Soda	7	6	Soda	20	12

Which of these matrices shows the change in consumption from 1978 to 1996?

A.

	Boys	Girls
Milk	-11	-5
Soda	9	3

B.

	Boys	Girls
Milk	-7	-2
Soda	13	6

C.

	Boys	Girls
Milk	2	7
Soda	8	1

D.

	Boys	Girls
Milk	25	16
Soda	27	18

47. The formula for the height of a falling object is shown below, where h is the height of the object in meters, t is the time in seconds, and k is the height, in meters, from which the object began its fall.

$$h = -4.9t^2 + k$$

If a rock is dropped from a building that is 150 meters tall, what is the height of the rock 4 seconds after it was dropped?

- A. 71.6 meters
- B. 78.4 meters
- C. 130.4 meters
- D. 145.1 meters

48. The matrix below shows the sales, in thousands of dollars, for three different stores over a period of two years.

	SALES		
	Store A	Store B	Store C
Year 1	110	250	400
Year 2	150	300	350

Each store's profit is 3% of its sales. What is the profit, in thousands of dollars, for Store B in Year 2?

49. The matrix below shows the annual salaries, in dollars, for 3 different jobs based on the employee's level of education.

	EDUCATION LEVEL	
	High School Diploma	College Degree
Secretary (Sec)	\$22,000	\$26,000
Customer Service Representative (CSR)	\$25,500	\$28,000
Manager (Mgr)	\$31,000	\$34,800

If each employee's salary increased by 5%, which of these matrices represents the new salaries?

A.	HS	College	B.	HS	College	C.	HS	College	D.	HS	College
Sec	\$1,100	\$1,300	Sec	\$11,000	\$13,000	Sec	\$23,100	\$27,300	Sec	\$33,000	\$39,000
CSR	\$1,275	\$1,400	CSR	\$12,750	\$14,000	CSR	\$26,775	\$29,400	CSR	\$38,250	\$42,000
Mgr	\$1,550	\$1,740	Mgr	\$15,500	\$17,400	Mgr	\$32,550	\$36,540	Mgr	\$46,500	\$52,200

50. Sue's doctor must decide how much medicine she needs for each dosage. The dosage (d), in milligrams, depends on Sue's body mass (m), in kilograms. The formula below is used to calculate the dosage of her medicine.

$$d = 0.1m^2 + 5m$$

What is the dosage needed, in milligrams, if Sue's body mass is 70 kilograms?

51. At the end of each day, Bob's Balloon Shop counts how many balloons they have in the store. The results of their Monday and Tuesday counts are shown in the matrices below. The shop received no new balloons on either day.

	MONDAY'S COUNT				TUESDAY'S COUNT		
	Plain	Helium	Water		Plain	Helium	Water
Red	38	68	14	Red	24	61	11
Yellow	32	39	21	Yellow	30	28	16
Blue	41	47	16	Blue	29	32	14
White	31	39	23	White	21	29	21

How many helium balloons did they sell on Tuesday?

- A. 7 B. 12 C. 38 D. 43

52. The formula to approximate the height (h) of a male, in inches, is shown below, where t is the length of the tibia bone, in inches.

$$h = 2.4t + 32.2$$

Paul's height is 69.4 inches. What is the approximate length, in inches, of Paul's tibia bone?

53. The matrices below show what drinks high school and college students prefer during the winter and the summer.

	DRINK PREFERENCE			
	Winter		Summer	
	High School	College	High School	College
Milk	408	200	405	200
Soda	650	560	808	708
Coffee	200	700	56	500

How many high school and college students prefer milk in winter and summer?

54. The matrix below shows the supplies that are needed to build two different model trucks.

	SUPPLIES NEEDED TO BUILD A MODEL			
	Wheels	Sheets of Plastic	Cans of Paint	Bottles of Glue
Dump Truck	4	10	1	2
Fire Truck	8	22	2	3

How many sheets of plastic are needed to build 17 fire trucks?

- A. 170
 B. 374
 C. 544
 D. 595

55. The matrices below show where Willings High School students went after graduating in the years 1998 to 2000. These students either went to work (W), to a technical college (T), or to a university (U).

		1998		1999		2000	
		Female	Male	Female	Male	Female	Male
W	$\begin{bmatrix} 110 & 135 \end{bmatrix}$			W	$\begin{bmatrix} 90 & 125 \end{bmatrix}$	W	$\begin{bmatrix} 85 & 125 \end{bmatrix}$
T	$\begin{bmatrix} 80 & 160 \end{bmatrix}$			T	$\begin{bmatrix} 125 & 175 \end{bmatrix}$	T	$\begin{bmatrix} 130 & 200 \end{bmatrix}$
U	$\begin{bmatrix} 205 & 214 \end{bmatrix}$			U	$\begin{bmatrix} 220 & 220 \end{bmatrix}$	U	$\begin{bmatrix} 240 & 220 \end{bmatrix}$

What is the total number of females who went to a university?

56. The formula below can be used to find the actual air temperature (t) when the wind speed is 20 miles per hour.

$$t = \frac{2}{3}w + 26$$

(w = wind-chill temperature)

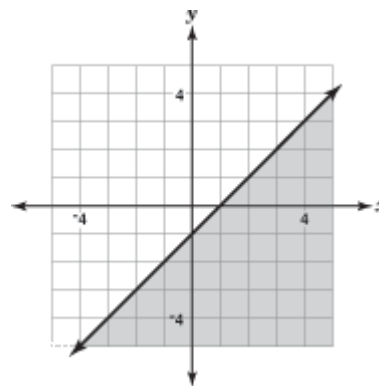
What is the actual air temperature if the wind-chill temperature is -12° ?

- A. -57°
- B. -21°
- C. 18°
- D. 41°

57. Bruce bought 4 candy bars and 3 decks of cards. The candy bars cost \$1.35 each. Bruce spent no more than \$12.00. Which of these inequalities best represents the cost (c) for one deck of cards?

- A. $c \leq \$2.20$
- B. $c > \$2.20$
- C. $c \leq \$3.55$
- D. $c > \$3.55$

58. Look at the graph below.



Which of these inequalities best describes this graph?

- A. $y \geq x - 1$
- B. $y \leq x - 1$
- C. $y > x - 1$
- D. $y < x - 1$

59. Manuel has budgeted \$80 a day to rent a truck. The rental company charges \$35 a day plus \$0.25 per mile. Which of these inequalities represents the number of miles (m) Manuel can drive in one day and stay within his budget?

- A. $m \leq 180$
- B. $m \geq 180$
- C. $m \leq 460$
- D. $m \geq 460$

60. Margaret is recording songs from CDs onto a cassette tape. She has already recorded 21 minutes onto her 60-minute tape. How many complete 5-minute songs will fit on the unrecorded part of the tape?

- A. 4
- B. 7
- C. 8
- D. 16

61. A week long soccer camp needs at least \$72,000 in order to pay expenses. The camp receives \$250 per person for day campers and \$400 for full-time campers. Which of these combinations would be enough to pay expenses?

- A. 78 day campers and 152 full-time campers
- B. 104 day campers and 114 full-time campers
- C. 117 day campers and 79 full-time campers
- D. 200 day campers and 29 full-time campers

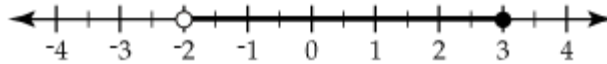
62. A company makes a standard model flashlight (s) and a deluxe model flashlight (d). The company makes a \$3 profit on each standard model and a \$4 profit on each deluxe model. The company wants to make a profit of at least \$320. Which of these inequalities represents this situation?

- A. $3s + 4d \leq 320$
- B. $3s + 4d \geq 320$
- C. $4s + 3d \leq 320$
- D. $4s + 3d \geq 320$

63. David sells both daylight and underwater cameras. For each daylight camera he sells, he makes \$2, and for each underwater camera he sells, he loses \$1. Let d represent the number of daylight cameras and u represent the number of underwater cameras sold. Which of these inequalities must be true for David to make money selling these cameras?

- A. $2d + u < 0$
- B. $2d + u > 0$
- C. $2d - u < 0$
- D. $2d - u > 0$

64. Look at the graph below.



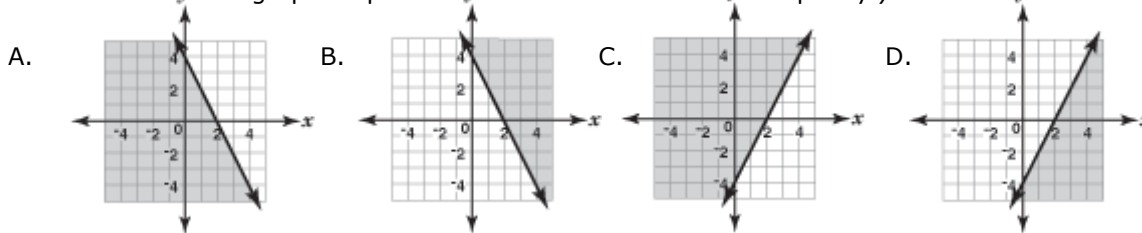
Which of these inequalities has the solution set that is shown in the graph?

- A. $-2 \leq x \leq 3$
- B. $-2 < x < 3$
- C. $-2 \leq x < 3$
- D. $-2 < x \leq 3$

65. When a snack bar opens, the cash register contains at least 50 dollars in \$1 and \$5 bills. Which of these inequalities represents this situation, where x is the number of \$1 bills and y is the number of \$5 bills?

- A. $x - 5y > 50$
- B. $x - 5y < 50$
- C. $x + 5y \geq 50$
- D. $x + 5y \leq 50$

66. Which of these graphs represents the solution set of the inequality $y \leq -2x + 4$?

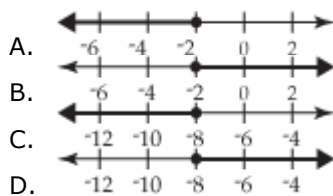


67. A school store sells pens for \$1.29 each and notebooks for \$2.25 each. Paul bought p pens and n notebooks. He spent less than \$10. Which of these inequalities represents this situation?

- A. $2.25p - 1.29n < 10$
- B. $1.29p - 2.25n < 10$
- C. $2.25p + 1.29n < 10$
- D. $1.29p + 2.25n < 10$

68. Look at the inequality: $12 - 4x \leq 20$

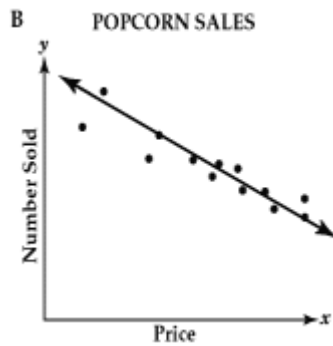
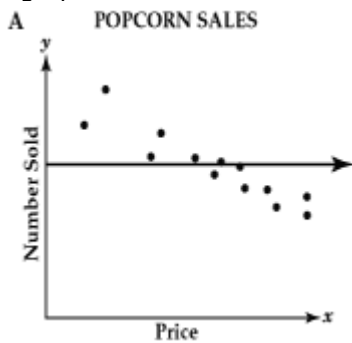
Which of these shows the solution to this inequality?



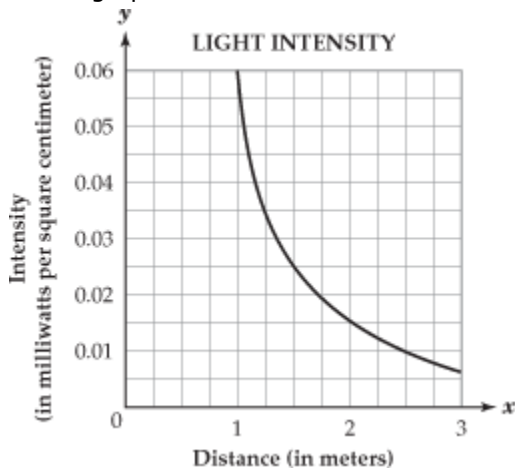
69. The scatter plot below shows the relationship between the number of bags of popcorn that are sold and the price per bag.



Which of these graphs shows the line of best fit?



70. The graph below models the relationship between light intensity and the distance from a light source.



Which of these is the best estimate of the intensity, in milliwatts per square centimeter, of light 2 meters from the source?

- A. 0.015
- B. 0.181
- C. 1.520
- D. 1.720

71. The table below shows the consumption of bottled water per person for the years 1980 through 1995.

CONSUMPTION OF BOTTLED WATER PER PERSON

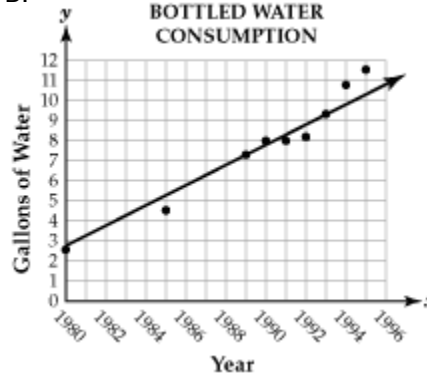
Year	1980	1985	1989	1990	1991	1992	1993	1994	1995
Water Consumption (in gallons)	2.4	4.5	7.4	8.0	8.0	8.2	9.4	10.7	11.6

Which of these lines best models the data?

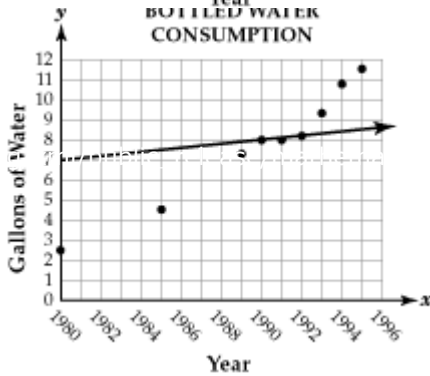
A.



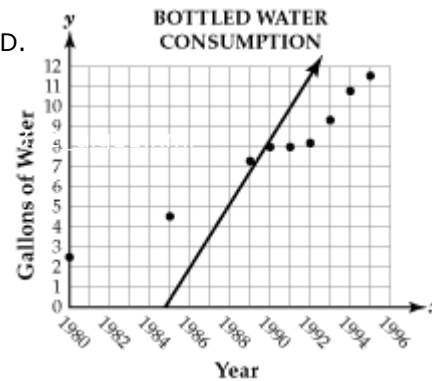
B.



C.



D.

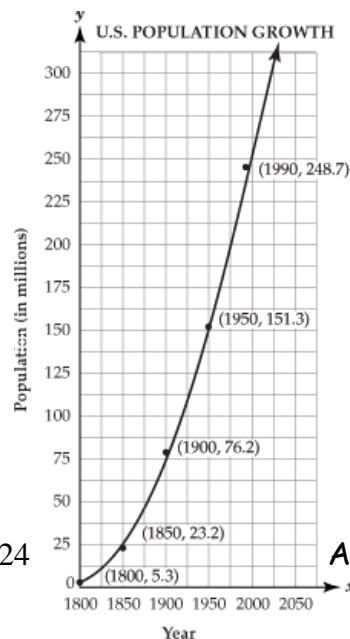


72. The graph below shows the population growth for the United States since 1800. A curve of best fit has been drawn.

According to the curve of best fit,

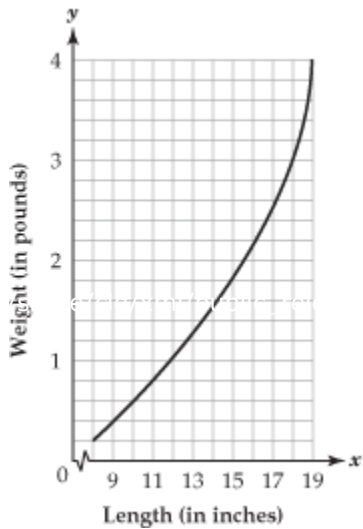
in what year will the population be 300 million?

- A. 2000
- B. 2024
- C. 2031
- D. 2050



73. The graph below relates the length and weight of fish found in Lake Opinicon.

FISH FROM LAKE OPINICON

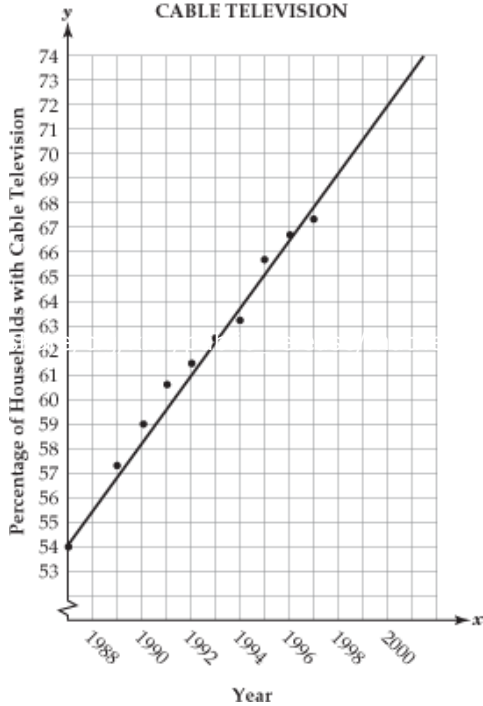


Using the curve of best fit, what would be the expected weight of a fish that is 14.5 inches long?

- A. 1.5 pounds
- B. 1.7 pounds
- C. 1.8 pounds
- D. 1.9 pounds

74. The graph below shows the percentage of television-owning households with cable television. The line of best fit is drawn.

HOUSEHOLDS WITH CABLE TELEVISION



Using the line of best fit, what percentage of television-owning households can be expected to have cable television in the year 2000?

- A. 69%
- B. 71%
- C. 72%
- D. 73%

75. The rental rates at Snappy Car Rental are \$30 per day plus \$0.25 per mile for each mile driven. Joe rented a car for one day and drove 300 miles. What is the total amount Joe paid to rent the car?

- A. \$30 B. \$75 C. \$105 D. \$300

76. Which of these equations represents a line with an x-intercept of -3 and a y-intercept of 4?

- A. $y = -\frac{3}{4}x - 3$ B. $y = \frac{3}{4}x - 3$ C. $y = -\frac{4}{3}x + 4$ D. $y = \frac{4}{3}x + 4$

77. Dominic rents a car for a trip. He pays \$300 plus \$0.20 per mile. Dominic has \$750 to spend on the car rental. What is the maximum number of miles Dominic can drive?

78. The sign shown below is posted at a parking garage.



What is the cost, in dollars, for parking 7 hours?

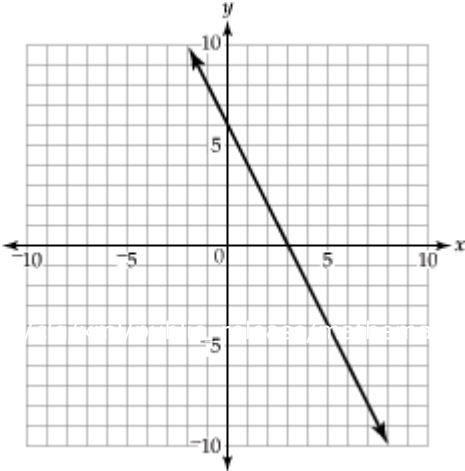
79. Debi and some students from her geometry class went outside to measure their shadows. Debi measured Sean's and Karyn's shadows and recorded the information in the table below.

SHADOW MEASUREMENTS

Name	Height (x)	Shadow Length (y)
Sean	159 cm	106 cm
Karyn	167 cm	112 cm

Debi plotted this data on a coordinate grid. What is the slope of the line containing these two points?

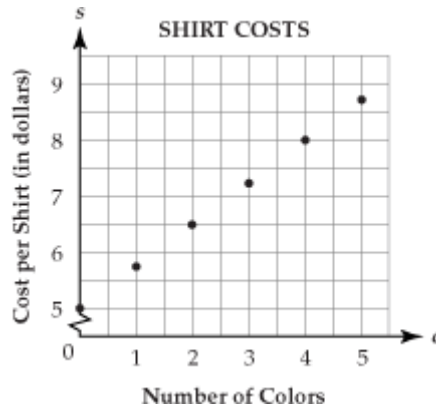
80. Look at the line that is graphed below.



Which of these equations describes this line?

- A. $y = -2x + 6$
- B. $y = -\frac{1}{2}x + 6$
- C. $y = \frac{1}{2}x + 6$
- D. $y = 2x + 6$

81. Tees for Teens is a store that sells shirts. The graph below represents the total cost per shirt based on the number of colors in the design.



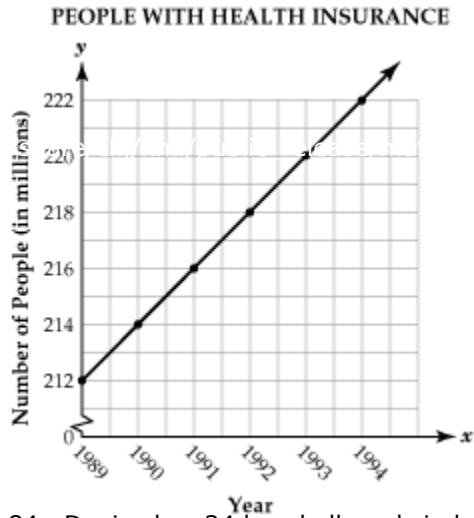
Which of these equations represents the relationship between the cost per shirt (s) and the number of colors (c)?

- A. $s = 0.75c + 5$
- B. $s = 1.5c + 5$
- C. $s = 5c + 0.75$
- D. $s = 5c + 3$

82. Lydia has \$200 in her bank account at the beginning of the year. Each month, she deposits \$40 into her account. She does not withdraw any money from her account, and the account pays no interest. Which of these equations could Lydia use to find the total amount (T) in her bank account at the end of m months?

- A. $T = 40m$
- B. $T = 240m$
- C. $T = 200m + 40$
- D. $T = 40m + 200$

83. The graph below shows a linear model of the number of people in the United States who have private or government health insurance.



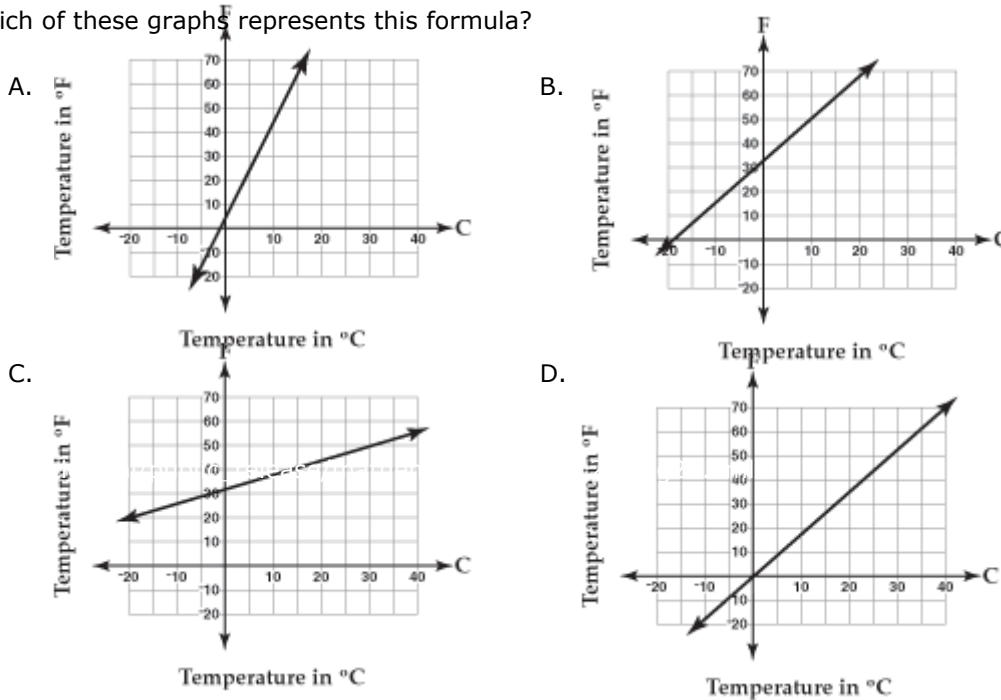
What is the slope, in millions of people per year, of this linear model?

84. Denise has 24 baseball cards in her collection. She collects 9 baseball cards per month. In how many months will she have a total of 150 baseball cards in her collection?

85. Carlos uses the formula below to change Celsius temperatures (C) into Fahrenheit temperatures (F).

$$F = 9C/5 + 32$$

Which of these graphs represents this formula?



86. The number of people (n) who will attend a dance depends on the admission price (p), in dollars. This relationship is represented by the equation shown below.

$$n = 800 - 50p$$

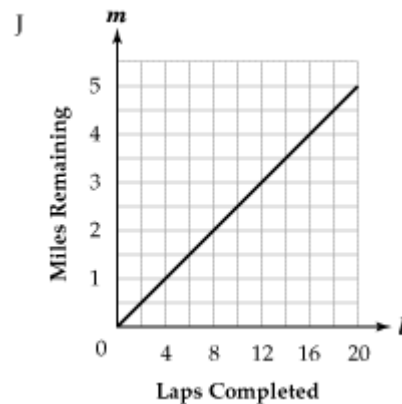
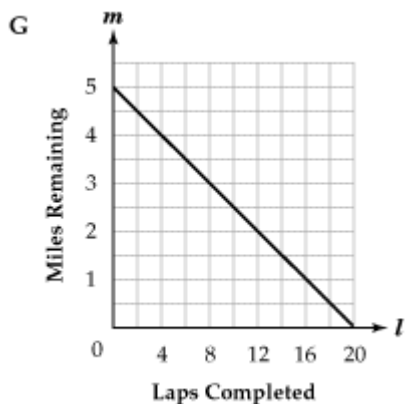
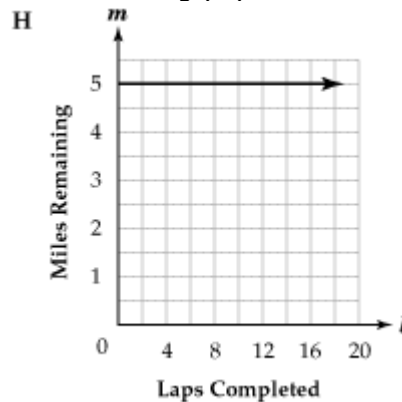
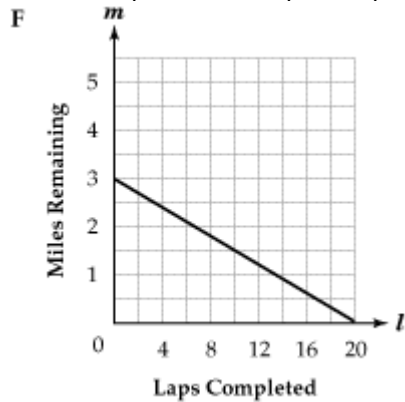
Which of these is a correct interpretation of the slope of this equation?

- A. 50 people will attend if the admission price is free
- B. 50 fewer people will attend for every dollar the admission price increases
- C. 800 people will attend if the admission price is free
- D. 800 fewer people will attend for every dollar the admission price increases

87. The total bill for repairing Steve's television was \$125. The repair shop charged \$25 an hour for labor plus \$19 for parts. How many hours of labor did it take to repair Steve's television? Round the answer to the nearest tenth of an hour.

- A. 4.2 hours
- B. 5.0 hours
- C. 5.3 hours
- D. 7.9 hours

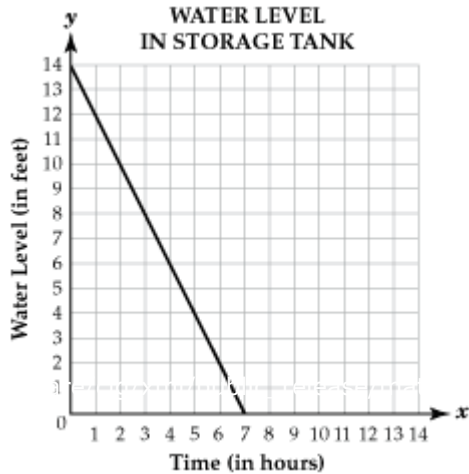
88. Courtney wants to run a total of 5 miles around a $\frac{1}{4}$ -mile track. Which of these graphs represents the relationship between laps completed (l) and miles remaining (m)?



89. A parachutist is 500 feet above the ground. After she opens her parachute, she falls at a constant rate of 5 feet per second. Which of these equations gives her height (h) above the ground in terms of seconds (t)?

- A. $h = 5 - 500t$ B. $h = 500 - 5t$ C. $h = -500 + 5t$ D. $h = 5 + 500t$

90. The water level in a storage tank is 14 feet. Water is released at a constant rate until the tank is empty. The graph below shows the water level (y) in the tank, as a function of time (x).



Which of these equations represents the relationship between time and the water level?

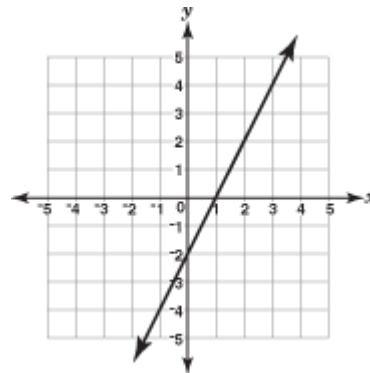
- A. $y = -2x + 14$
 B. $y = -2x - 14$
 C. $y = 2x + 14$
 D. $y = 2x - 14$

91. Julie is a member of a swim club. The swim club charges a monthly fee of \$15 plus \$0.50 per hour to use the pool. Julie spent \$35 in August to use the pool. How many hours did Julie use the pool in August?

92. Look at the graph below.

What is the slope of the line?

- A. -2
 B. $-\frac{1}{2}$
 C. $\frac{1}{2}$
 D. 2



93. Alexis has \$345 in her savings account and will deposit \$15 each week. Alexis will not withdraw any money from her savings account. After how many weeks will she have \$1,035?

94. Art's swimming pool contains 20,000 gallons of water. He drains the pool at a rate of 5 gallons per minute. Which of these equations represents the number of gallons of water (g) remaining in the pool after m minutes?

- A. $g = 20,000 - 5m$
- B. $g = 20,000 + 5m$
- C. $g = 20,000 / 5m$
- D. $g = 5m / 20,000$

95. The depth of a lake is 26 meters. Melting snow causes the lake to rise 0.05 meters each day. At the end of 8 days, what will be the depth, in meters, of the lake?

96. The table below shows a relationship between x and y

x	0	1	2	3	4	5
y	1	2	5	10	?	?

What are the next two values for y ?

- A. 11 and 13
- B. 15 and 22
- C. 16 and 25
- D. 17 and 26

97. The diagram below shows a floor tile that is moved in different positions.



Which of these describes the movement of the tile?

- A. flipped vertically
- B. flipped horizontally
- C. turned clockwise 90°
- D. turned counterclockwise 90°

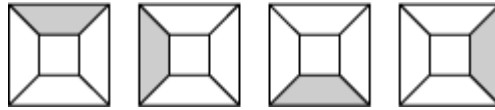
98. Look at the pattern below.

$$2x + 4, 2x + 1, 2x - 2, \dots$$

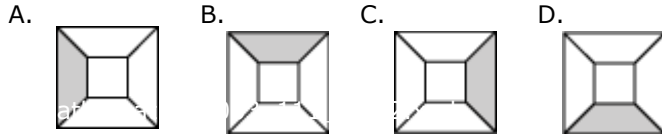
If the pattern continues, what will be the seventh term?

- A. $2x + 11$
- B. $2x - 11$
- C. $2x + 14$
- D. $2x - 14$

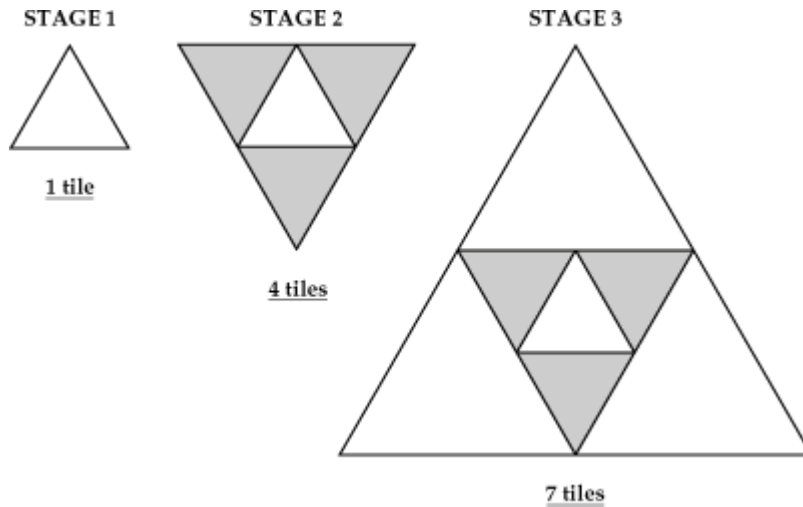
99. The first four tiles in a pattern are shown below.



If the pattern continues, what will be the ninth tile in the pattern?



100. A design starts with one equilateral, triangular tile. A tile of the same shape is added to each side. The first three stages with number of tiles used are shown below.



If this pattern continues, how many triangular tiles will be used in the pattern at stage 8 ?

101. Look at the pattern below.

12, 36, 108, 324, ...

If this pattern continues, what will be the next term?

- A. 540 B. 648 C. 972 D. 1,296

102. The table below shows the total number of people served in a cafeteria.

PEOPLE SERVED IN A CAFETERIA

Time	Total Number of People Served
12:00	25
12:10	55
12:20	85
12:30	115

If the pattern continues, what will be the total number of people served by 1:00?

- A. 145 B. 175 C. 205 D. 235

103. Look at the pattern below.

$$\frac{16}{4}, \frac{21}{4}, \frac{26}{4}, \frac{31}{4}, \frac{36}{4}, \frac{41}{4}, \dots$$

If the pattern continues, what will be the tenth term?

104. The table below shows a relationship between x and y .

x	0	1	2	3	4	?
y	-1	0	3	8	15	?

If the pattern continues, what are the next values for x and y ?

- A. $x = 5, y = 20$ B. $x = 5, y = 22$ C. $x = 5, y = 24$ D. $x = 5, y = 35$

105. The table below shows Joe's weekly pay based on the number of pairs of shoes he sells.

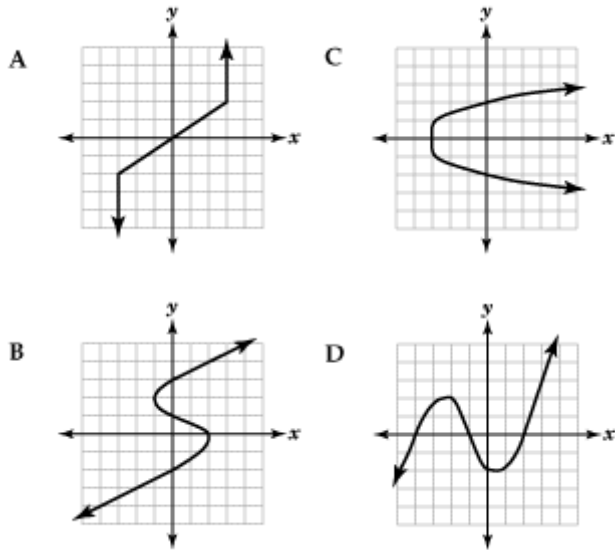
JOE'S WEEKLY SHOE SALES

Numbers of Pairs Sold	Weekly Pay (in dollars)
10	560
20	620
30	680

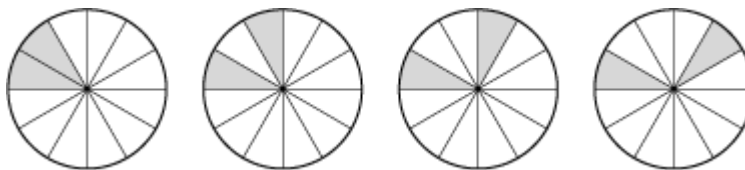
If he sells 50 pairs of shoes a week, what is Joe's weekly pay?

- A. \$740 B. \$800 C. \$1,300 D. \$2,800

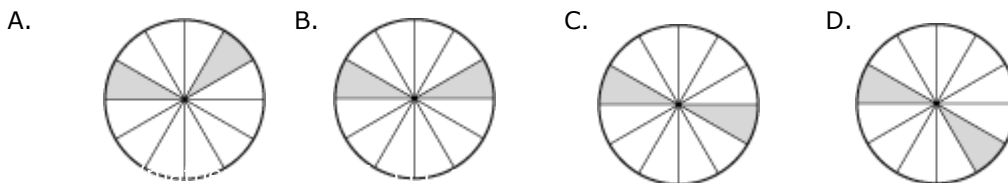
106. Which of these graphs shows a functional relationship?



107. Look at the pattern below.



If this pattern continues, what will be the next figure?



108. Look at the pattern: 21, 19.8, 18.6, 17.4, 16.2, ...

If this pattern continues, what will be the tenth term?

109. Look at the pattern below.

0, 3, 8, 15, 24, ...

If the pattern continues, what will be the 8th term?

- A. 35 B. 48 C. 63 D. 80

110. The table below shows the number of tulips that are in bloom in Tara's garden at the end of each day.

TULIPS IN BLOOM IN TARA'S GARDEN	
End of Day	Number of Tulips
1	1
2	4
3	7
4	10
5	13

If this pattern continues, how many tulips will be in bloom at the end of day 8?

- A. 16 B. 19 C. 22 D. 25

111. Cory is a baseball pitcher. Cory's pitching speed increases by 2 miles per hour every 5 weeks of practice. Which of these graphs shows the relationship between the number of weeks of practice and Cory's pitching speed?

A.



B.



C.



D.



112. A fish tank empties at a constant rate. The table below shows the volume of water left in the fish tank after each minute.

FISH TANK VOLUME

Minutes (t)	Volume (v)
0	630
1	622
2	614
3	606
4	598

Which of these equations describes the volume of water in the tank as a function of time?

- A. $v = -8t + 622$ B. $v = -8t + 630$ C. $v = 8t + 622$ D. $v = 8t + 63$

113. Look at the equation below.

$$y = x^2 + 6$$

Which of these tables represents solutions for this equation?

F

x	-1	0	1	2
y	49	36	49	64

G

x	-1	0	1	2
y	7	6	7	10

H

x	-1	0	1	2
y	5	6	7	10

J

x	-1	0	1	2
y	25	6	49	64

114. Wind makes the air feel colder than the actual temperature. This is called wind chill. The table below shows the effect that a 20-mile-per-hour wind has on the actual air temperature.

WIND-CHILL EFFECT OF 20-MILE-PER-HOUR WIND

Actual Temperature (t)	Wind-Chill Temperature (w)
45°F	25°F
25°F	-3°F
5°F	-31°F

Which of these equations represents the relationship between the actual temperature (t) and the wind-chill temperature (w)?

- A. $w = 0.714t - 7$ B. $w = 0.714t + 7$ C. $w = 1.4t - 38$ D. $w = 1.4t + 38$

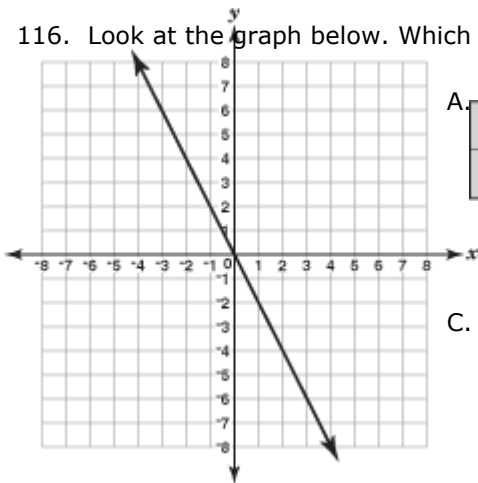
115. The table below shows a relationship between x and y .

x	y
-4	-2
0	0
4	2
8	4

Which of these equations represents this relationship?

- A. $y = x^2$
 B. $y = 2x$
 C. $y = \frac{1}{2}x$
 D. $y = x - 2$

116. Look at the graph below. Which of these tables corresponds to the line that is graphed?



A.

x	-3	-1	1	3
y	6	2	-2	-6

B.

x	-3	-1	1	3
y	6	-2	2	-6

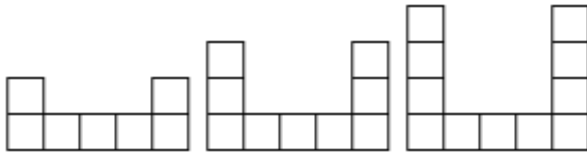
C.

x	2	0	-2	-6
y	-4	0	-4	3

D.

x	-2	0	2	6
y	-4	0	4	3

117. Tommy used building blocks to create the designs below.



Design 1

Design 2

Design 3

The table below shows the number of blocks in each design.

DESIGN TABLE

Design Number (d)	1	2	3
Number of Blocks in Design (b)	7	9	11

Which of these equations shows the relationship between the design number (d) and the number of blocks (b) in the design?

- A. $b = d + 6$ B. $b = 2d + 5$ C. $b = 3d + 2$ D. $b = 4d + 3$

118. A library is trying to decrease the number of overdue books by increasing the fines. They plan to charge \$0.25 for the first day a book is late and \$0.10 for each additional day. Which of these tables represents the fines for the first five days a book is late?

A. LIBRARY FINES

Days Late	Fine
1	\$0.10
2	\$0.20
3	\$0.30
4	\$0.40
5	\$0.50

B.

LIBRARY FINES

Days Late	Fine
1	\$0.10
2	\$0.35
3	\$0.60
4	\$0.85
5	\$1.10

C.

LIBRARY FINES

Days Late	Fine
1	\$0.25
2	\$0.35
3	\$0.45
4	\$0.55
5	\$0.65

D.

LIBRARY FINES

Days Late	Fine
1	\$0.25
2	\$0.45
3	\$0.55
4	\$0.65
5	\$0.75

119. The table below shows a relationship between x and y .

x	y
1	1
3	-3
6	-9
8	-13

Which of these equations represents this relationship?

- A. $y = 2x - 1$
 B. $y = 2x - 2$
 C. $y = -2x + 3$
 D. $y = -2x - 1$

120. Harry works cleaning houses. He charges \$15 per hour plus a \$10 travel fee to clean each house. Which of these tables shows the total amount (c) charged, in dollars, to clean a house for h hours?

A.

HARRY'S CHARGES

Hours Spent Cleaning (h)	Amount Charged (c)
3	\$45
5	\$65
7	\$85
9	\$105

B.

HARRY'S CHARGES

Hours Spent Cleaning (h)	Amount Charged (c)
3	\$45
5	\$75
7	\$105
9	\$135

C.

HARRY'S CHARGES

Hours Spent Cleaning (h)	Amount Charged (c)
3	\$55
5	\$85
7	\$115
9	\$145

D.

HARRY'S CHARGES

Hours Spent Cleaning (h)	Amount Charged (c)
3	\$75
5	\$125
7	\$175
9	\$225

121. The table below shows a relationship between x and y .

x	y
1	1
2	8
3	15
4	22
5	29
6	36

Which of these equations represents this relationship?

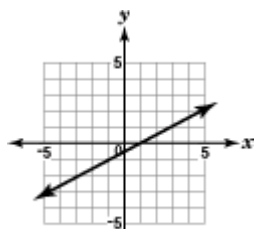
- A. $y = 6x + 7$
- B. $y = 6x - 7$
- C. $y = 7x + 6$
- D. $y = 7x - 6$

122. The table below shows a linear relationship between x and y .

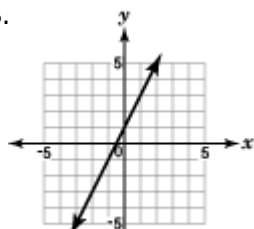
x	-2	-1	0	1	2
y	5	3	1	-1	-3

Which of these graphs shows this relationship?

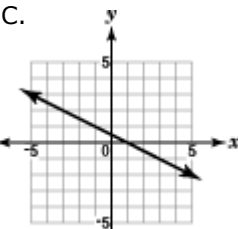
A.



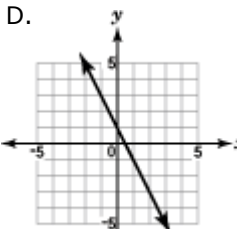
B.



C.



D.



123. The table below shows a relationship between x and y .

x	y
1	5
2	7
3	9
4	11

Which of these equations represents this relationship?

- A. $y = -2x + 7$
- B. $y = 2x + 3$
- C. $y = 3x + 2$
- D. $y = 7x - 2$

124. Steve is a member of the baseball team. He averages 2 hits for every 5 times at bat. Steve might get a hit his next time at bat. Which of these methods could not be used to simulate this situation?

- A. Flip a fair coin once. Let heads represent a hit and let tails represent not getting a hit.
- B. Use a random number generator. Let 1 and 5 represent a hit and let 2, 3, and 4 represent not getting a hit.
- C. Spin a spinner with 10 equally-sized sections. Let 4 sections represent getting a hit and let 6 sections represent not getting a hit.
- D. Draw a marble from a bag that contains 8 red and 12 blue marbles. Let a red marble represent getting a hit and let a blue marble represent not getting a hit.

125. A teacher conducts a random survey to determine how many students use the school library on a regular basis. Which of these methods would provide the teacher with a simple random sample?

- A. Choose every 3rd student that enters the library on Monday.
- B. Select 50 students from the list of students who have perfect attendance.
- C. Choose the name of every 10th student in her grade book until 30 names are selected.
- D. Number every student in the school and then generate random numbers to select 50 students.

126. Inés wants to conduct a survey to determine how many customers see the advertisement for her store. Which of these methods provides Inés with the most representative sample of her customers?

- A. Survey customers who live near her store.
- B. Survey customers who shop at her store on weekends.
- C. Survey customers who shop at her store early in the morning.
- D. Survey customers who shop at her store at different times throughout the week.

127. A spinner has spaces labeled X, Y, and Z. The spinner was spun 20 times. The results are shown in the table below.

RESULTS OF SPINNER EXPERIMENT

Letter	Number of Times Spinner Landed on Letter
X	4
Y	3
Z	13

According to this data, what is the experimental probability that the spinner will land on Y?

- A. $\frac{3}{20}$
- B. $\frac{4}{20}$
- C. $\frac{13}{20}$
- D. $\frac{17}{20}$

128. Mrs. Penner has 7 keys for her school on her key ring. All of the keys are different but look alike. One of these keys is for the bathroom and two are for her classroom. If she picks one key at random, what is the probability that the key is not for the bathroom or her classroom?

129. Hank tosses 4 coins at the same time. He repeats this action 10 times. The results are shown below, where H represents heads and T represents tails.

HHTT TTHT HHHH THTH HHTT
 HTHT TTHT HTHH HTTH HTHH

Based on this data, what is the probability that at least one out of the group of 4 coins tossed will land with tails up?

130. Pedro designed a board game with a spinner that is divided into 4 equal sections: 1, 2, 3, and "Lose a Turn." He wanted to determine how many times a player would spin "Lose a Turn" in 10 spins. He conducted a simulation where one trial consisted of 10 spins. The table below shows his results for 50 trials.

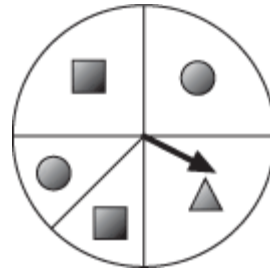
SIMULATION RESULTS

Number of "Lose a Turn" Spins	Frequency
0	5
1	12
2	11
3	15
4	4
5	2
6	0
7	1
8	0
9	0
10	0

Based on the simulation, what is the probability that a player will spin "Lose a Turn" 3 or more times in 10 spins?

- A. $\frac{7}{50}$
- B. $\frac{15}{50}$
- C. $\frac{22}{50}$
- D. $\frac{43}{50}$

131. The Game Land Company developed a new trivia game. The spinner below is used to determine what kind of question is asked. The spinner is divided into 4 equal sections. One of the sections is divided in half.



What is the probability that a circle question is asked?

132. A company manufactures CD players. The quality control department checks 600 CD players and discovers that 12 of them are defective. What is the probability that a CD player is not defective?

- A. 0.12 B. 0.50 C. 0.72 D. 0.98

133. The table below shows information about the students in Ms. Murphy's algebra class.

STUDENTS WHO RIDE THE BUS

	Male	Female
Rides the Bus	6	8
Does Not Ride the Bus	9	5

What is the probability that a randomly selected male student does not ride the bus to school?

- A. $\frac{9}{28}$
 B. $\frac{9}{14}$
 C. $\frac{15}{28}$
 D. $\frac{9}{14}$

134. A recent survey of Americans who work outside the home found that 10% take public transportation, 80% drive to work, and 10% use other forms of transportation.

Meghan used a random number generator to simulate the various methods that a group of five people may use to get to work. For her simulation, Meghan assigned digits to the various methods of transportation as shown in the table below.

TRANSPORTATION SIMULATION

Random Digit	Type of Transportation
0	public
1 through 8	drive
9	other

She ran the simulation 10 times, and the results are shown below.

69969 80939 49510 73686 62625
 19598 31305 40702 62385 67996

Based on Meghan's simulation, what is the probability that all 5 people in the group drive to work?

135. In a simulation designed to represent families with two children, two coins are tossed to model the gender of each child. The results of 50 trials are shown in the table below.

GENDER SIMULATION

First Child	Second Child	Frequency
boy	boy	15
boy	girl	14
girl	boy	8
girl	girl	13

Based on the results in the table, what is the probability that a family with two children have at least one boy?

- A. 0.30
- B. 0.44
- C. 0.58
- D. 0.74

136. The words "mathematics" and "algebra" are written on cards with one letter on each card. If one card is drawn at random, what is the probability that the card will have an "a" on it?

- A. $\frac{2}{9}$
- B. $\frac{2}{11}$
- C. $\frac{1}{12}$
- D. $\frac{4}{19}$

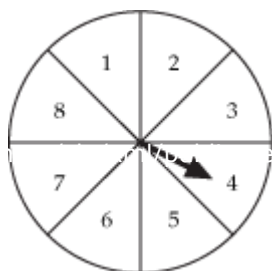
137. Valerie surveyed 50 people about their choice of pizza crusts. Her results are shown in the table below.

FAVORITE PIZZA CRUSTS

	Thin Crust	Thick Crust
Teens	18	7
Adults	14	11

If an adult is selected at random, what is the probability that the adult prefers thin crust?

138. The spinner below is divided into 8 equal sections.



If the arrow lands on a number, what is the probability that it will land on a 1 or a 4 ?

139. A bag contains 5 red apples, 7 yellow apples, and 8 green apples. Brett picks an apple from the bag without looking. What is the probability that Brett will pick a green apple?

140. The senior class sold school spirit items. The table below shows the number of items sold on the first day of a two-day sale.

**SCHOOL SPIRIT ITEMS
SOLD ON THE FIRST DAY**

Item	Number Sold
T-shirt	15
Frisbee	14
Hat	22
Pen	23
Ribbon	16

Based on sales from the first day, what is the probability that the first person on the second day of the sale will buy a hat?

141. Customers at Harvey's Store can win appliances at the grand opening. The table below shows the type and the number of appliances.

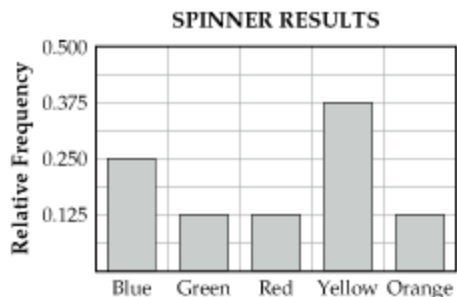
**APPLIANCES
CUSTOMERS CAN WIN**

Type	Number
Blender	6
Iron	5
Toaster	4
TV	1

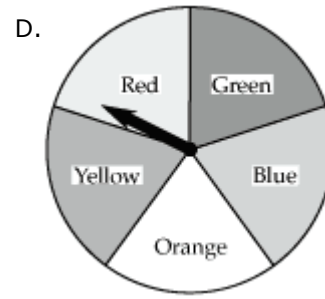
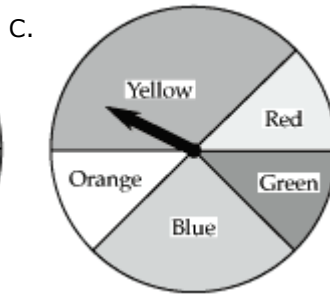
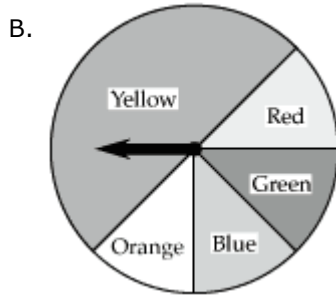
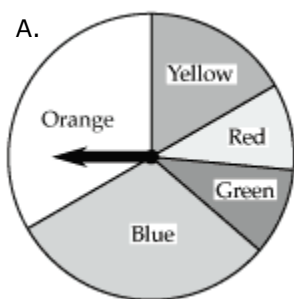
Toby is the first customer to win an appliance. What is the probability that Toby will win an iron or a toaster?

- A. $\frac{4}{16}$
- B. $\frac{5}{16}$
- C. $\frac{9}{16}$
- D. $\frac{11}{16}$

142. The bar graph below shows the results of spinning a spinner 1,000 times. The spinner has 5 colored sections.



Which of these spinners most likely produced the above bar graph?



143. Judy asked 140 students at her high school their opinion of the school mascot. The survey results are shown below.

SURVEY RESULTS

	Male	Female
Likes Mascot	47	43
Does Not Like Mascot	8	15
No Opinion	15	12

If a female student is selected at random, what is the probability that she likes the mascot?

144. A reporter surveyed 300 randomly selected people of all ages about their opinion of a new song. The results are shown in the table below.

SURVEY RESULTS

Age Group	Liked It	Did Not Like It	No Opinion
Younger than 25	55	30	15
25-46	50	30	20
Older than 46	32	60	8

What is the probability that a person who had no opinion of the new song was older than 46?

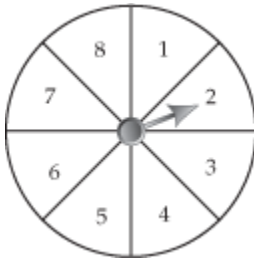
145. Paloma conducts a survey to determine the type of candy that students prefer. The survey results are shown in the table below.

SURVEY RESULTS

Type of Candy	Number of Students
Chocolate Chews	21
Fruit Bursts	15
Mint Cremes	23
Peanut Buddies	16

Based on the survey results, what is the probability that a randomly selected student prefers Fruit Bursts?

146. The spinner below has 8 equal sections.



What is the probability of spinning a number less than 3?

- A. $\frac{1}{4}$
- B. $\frac{3}{4}$
- C. $\frac{1}{8}$
- D. $\frac{3}{8}$

147. A quality control engineer for the Have Fun Toys Company tested 800 video game cartridges and found 3 defective cartridges. The company plans to produce 500,000 video game cartridges this year. Based on the findings, how many video game cartridges can be expected to be defective?

- A. 16
- B. 20
- C. 1,875
- D. 2,000

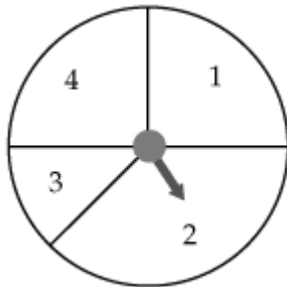
148. Sue is scheduled to take a biology test at school today. To perform well on the test, she knows it is best to eat a breakfast with a high ratio of carbohydrates to serving size.

Food	Serving Size (in grams)	Carbohydrates (in grams)
Bagel	68	38
Milkshake	283	60
Raisins	145	115
Wheat cereal	25	23

Which of these foods has the highest ratio of carbohydrates to serving size?

- A. Bagel
- B. Milkshake
- C. Raisins
- D. Wheat cereal

149. The spinner shown below is spun 20 times. The results of the spins are shown below.



1 2 1 4 3
 2 1 2 2 2
 4 4 2 3 1
 2 4 1 4 2

Based on these results, how many times would 2 be expected to appear in 60 spins?

- A. 8
- B. 15
- C. 24
- D. 28

150. Karen spun a spinner 50 times and recorded her results in the table below. The spinner had five numbered sections.

RESULTS OF 50 SPINS

Section	Frequency
1	13
2	8
3	10
4	12
5	7

Based on the results in the table, how many times should Karen expect the spinner to land on section 3 or 4 if she spins the spinner 300 times?

- A. 60
- B. 72
- C. 108
- D. 132

151. A student at West High School conducted a random survey of 200 tenth-grade students to determine their favorite season. The survey results are shown in the table below.

TENTH-GRADE STUDENTS' FAVORITE SEASON

Season	Number of Students
Winter	42
Spring	64
Summer	52
Fall	42

There are 500 tenth-grade students in the school. Based on the survey results, how many of these tenth-grade students would be expected to choose Spring as their favorite season?

- A. 105
- B. 125
- C. 130
- D. 160

152. A television producer wants to broadcast a new program for young children. The table below shows information on the average daily television viewing time for two age groups of children.

AVERAGE DAILY TELEVISION VIEWING TIME (BY TIME PERIOD)

Age Group (years)	7 to 10 a.m.	10 a.m. to 1 p.m.	1 to 4 p.m.	4 to 7 p.m.	7 to 10 p.m.
2-5	1 hr 13 min	45 min	17 min	43 min	10 min
6-11	3 min	5 min	3 min	35 min	55 min

Based on the data in the table, which time period would be the best choice for the new television program for 2- to 5-year-olds?

- A. 7 to 10 a.m.
- B. 10 a.m. to 1 p.m.
- C. 4 to 7 p.m.
- D. 7 to 10 p.m.

153. Mr. Shin wants to order notebooks for the school store. Notebooks come in four colors: red, blue, green, and black. He randomly surveyed 50 students to determine which color notebook they would buy. The table below shows the results.

NOTEBOOK COLOR VOTES

Color	Red	Blue	Green	Black
Number of Votes	16	22	5	7

Mr. Shin will order 400 notebooks. How many blue notebooks should he order?

- A. 22
- B. 88
- C. 176
- D. 200

154. The mayor of a town conducted an opinion survey of 90 randomly selected voters. The mayor wants to determine if a new shopping mall should be built in town. The survey results are shown in the table below.

OPINION SURVEY RESULTS

Want a New Mall	60
Do Not Want a New Mall	20
No Opinion	10

There are 1,440 voters in the town. How many voters would be expected to want the new shopping mall built?

- A. 160 B. 320 C. 860 D. 960

155. One hundred randomly selected students from Western High School were surveyed to determine whether they would like school to start one hour later. Of the students surveyed, 58 favored the change. Western High School has 1,200 students. According to the survey results, which of these is a reasonable prediction of the total number of students who would favor this change?

- A. 42 B. 58 C. 504 D. 696

156. A quality-control expert for a key manufacturer examined the keys produced by a particular machine. The table below shows the number of defective keys found in the 8 groups of 100 keys he examined.

GROUPS OF 100 KEYS EXAMINED

Group Number	1	2	3	4	5	6	7	8
Number of Defective Keys	7	2	4	5	7	8	1	0

How many defective keys would be expected in a group of 5,000 keys? Round the answer to the nearest whole number.

- A. 150 B. 170 C. 213 D. 243

157. The table below shows the possible scores for a game and the number of times each score occurred.

GAME SCORES

Score	Frequency
10	9
8	11
7	6
5	7
0	7

Using the information in the table, predict how many times a score of "7" would occur in 100 tries.

- A. 12
B. 15
C. 18
D. 22

158. Each year Ms. Fong, a physics teacher, has her students build bridges out of toothpicks. Last year Ms. Fong recorded the number of toothpicks that 20 of her students used. Her list is shown below.

NUMBER OF TOOTHPICKS USED BY EACH STUDENT

157	200	150	175	130
160	172	157	142	135
144	157	162	140	131
121	136	132	158	141

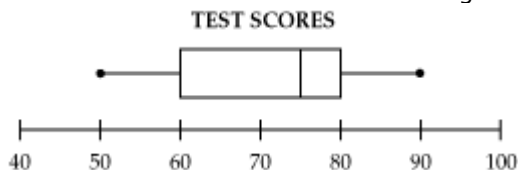
Ms. Fong will use the mode of this data set to determine the number of toothpicks needed for each student this year. How many toothpicks will be needed for each student?

- A. 147 B. 150 C. 157 D. 200

159. A businesswoman calculates that the median cost of her five business trips last month was \$600. Which of these statements is correct?

- A. She spent a total of \$3,000 on business trips last month.
- B. She spent \$600 on most of the business trips last month.
- C. She spent \$600 or more on at least half of the business trips last month.
- D. She spent \$600 more on her most expensive business trip than she did on her least expensive trip.

160. The box-and-whisker plot below summarizes the test scores of an algebra class.



Based on the box-and-whisker plot, which of these must be true?

- A. The median score is 70.
- B. The lower quartile score is 50.
- C. Half of the scores are between 60 and 75.
- D. The interquartile range is half of the range.

161. The growing season is defined as the average number of days between the last frost in the spring and the first frost of the fall. The table below shows the average growing season for nine major U.S. cities.

AVERAGE GROWING SEASON (IN DAYS)

279	198	165
271	193	156
262	192	156

If the circled number 156 is changed to 256, how would the mean, median, and mode of this data change?

- A. increase mean, median, and mode
- B. decrease mean, median, and mode
- C. increase mean, median, eliminate mode
- D. increase mean and mode, decrease median

162. While studying a school's top 10 college entrance exam scores, a guidance counselor found the mean score to be 1,472. In looking at the calculations, the counselor realized he had made a mistake. One of the student's scores was 10 points greater than the counselor used in his calculations. What is the correct mean score?

- A. 1,462
- B. 1,472
- C. 1,473
- D. 1,482

163. Four teachers gave a test to their classes. A summary of the test results is shown below.

TEST RESULTS

Teacher	Minimum Score	Q1	Median	Q3	Maximum Score
Mrs. Lee	52	73	83	89	95
Mr. Green	54	75	79	89	93
Mrs. Smith	73	78	84	93	96
Mr. Wang	42	83	91	96	100

Which teacher's class has the widest spread in the middle 50% of the test scores?

- A. Mrs. Lee
- B. Mr. Green
- C. Mrs. Smith
- D. Mr. Wang

164. The table below shows the average daily temperatures, in degrees Fahrenheit ($^{\circ}\text{F}$), for four selected cities. The average daily temperatures are given for the months of January and July.

AVERAGE DAILY TEMPERATURES (IN $^{\circ}\text{F}$)

City	January	July
Baltimore	40.0	87.0
Mexico City	70.3	73.8
Tokyo	49.1	83.8
Toronto	27.5	80.2

According to the information in the table, which city experiences the greatest range of temperatures between January and July?

- A. Baltimore
- B. Mexico City
- C. Tokyo
- D. Toronto

165. The table below shows the percentages of high school students who took a college entrance examination in

1997 in 7 states.

STUDENTS WHO TOOK A COLLEGE ENTRANCE EXAM

State	Percentage
California	45
West Virginia	46
Alaska	48
Maryland	64
New Jersey	69
Pennsylvania	72
Massachusetts	80

Which of these states' percentages is at the third quartile?

- A. Maryland
- B. Massachusetts
- C. New Jersey
- D. Pennsylvania

166. The table below shows the number of points scored by the winner of the men's ski jumping competition during the Olympics from 1980 to 1994.

MEN'S SKI JUMPING

Year	Points
1980	266.3
1984	215.2
1988	230.5
1992	222.8
1994	282.0
1998	?

After the 1998 Olympics, the mean number of points scored by all winners since 1980 was 241.9. Which of these might have been the winning number of points in 1998?

- A. 217.5
- B. 234.6
- C. 243.1
- D. 248.4

167. Paul earned scores of 76, 78, and 86 on his first three science tests. What score does he need on his fourth test to earn a mean score of 82?

- A. 78
- B. 80
- C. 84
- D. 88

168. A credit card company investigates any purchase that is larger than the third quartile of a customer's last 12 purchases. Mike's last 12 purchases are shown below.

\$6.98	\$15.92	\$31.84	\$39.55
\$7.56	\$19.47	\$36.64	\$40.03
\$14.95	\$26.34	\$38.25	\$42.47

What is the largest purchase Mike could make next without having his purchase investigated?

- A. \$26.25
- B. \$28.84
- C. \$38.75
- D. \$43.25

169. An athletic director asked 4 groups of students, "What is the most that you would pay for an athletic event?" The responses are shown below.

AMOUNT STUDENTS WOULD PAY FOR ATHLETIC EVENT

Group 1	Group 2	Group 3	Group 4
\$5.00	\$4.00	\$4.00	\$4.00
\$4.00	\$3.00	\$5.00	\$3.00
\$3.00	\$2.00	\$1.00	\$3.00
\$3.00	\$5.00	\$2.00	\$3.00
\$2.00	\$2.00	\$3.00	\$4.00

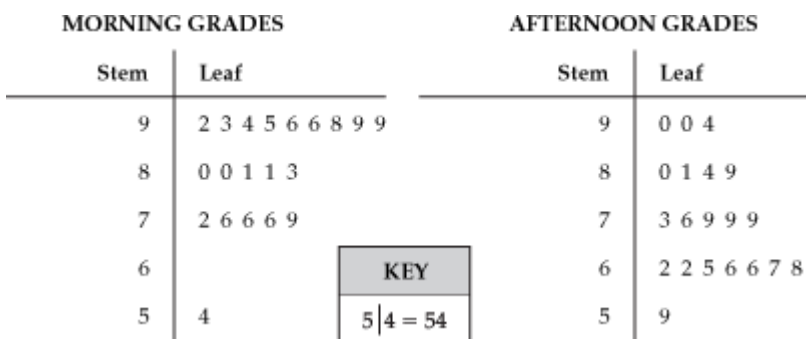
Which group's answers showed the least variability?

- A. Group 1 B. Group 2
C. Group 3 D. Group 4

170. Christine has a mean score of 18 points per game in her first four basketball games of the season. How many points must she score in her next game to raise her mean score to 20 points per game?

- A. 20 B. 22 C. 25 D. 28

171. The student government wants to determine if students get better grades in morning or afternoon classes. They randomly surveyed 20 students that take math class in the morning and 20 students that take math class in the afternoon. The survey results are shown in the stem-and-leaf plots below.



- What is the median for the morning_class?

172. Look at the bowling scores in the table below.

WEEKLY BOWLING SCORES										
Week	1	2	3	4	5	6	7	8	9	10
Score	123	154	117	121	163	135	111	132	109	149

Which of these is the range of the bowling scores?

- A. 10 B. 26 C. 34 D. 54

173. The table below lists the names most frequently given to boys born in Hollister City during the year 2000.

NAMES MOST FREQUENTLY GIVEN TO BOYS IN HOLLISTER CITY IN 2000

Rank	Name	Number
1	Michael	21
2	Jacob	19
3	Timothy	17
4	José	15
5	Calvin	13

Mary concludes that 20% of the boys born in Hollister City during 2000 were named Timothy. Why is Mary's conclusion incorrect?

- A. Mary did not consider the top five names for girls.
- B. Mary did not consider the entire population of the United States.
- C. Mary did not consider the names most frequently given to boys in other years.
- D. Mary did not consider that there were other names given to boys born in the year 2000.

174. Ms. Madison, a dance teacher, wants to know if students would go to an after-school dance. According to simple random sampling principles, which of these is the best method to survey students about the dance?

- A. Ask 50 girls to complete a survey.
- B. Ask 50 students who attended the last dance.
- C. Ask 50 randomly selected students from her classes.
- D. Ask 50 randomly selected students from the school.

175. Wendy asked 40 students on the school football team if they have ever injured themselves playing sports. Fifteen football team members responded "Yes." Wendy concluded that 375 of the 1,000 students in her school have injured themselves playing sports. Which of these explains why her conclusion is invalid?

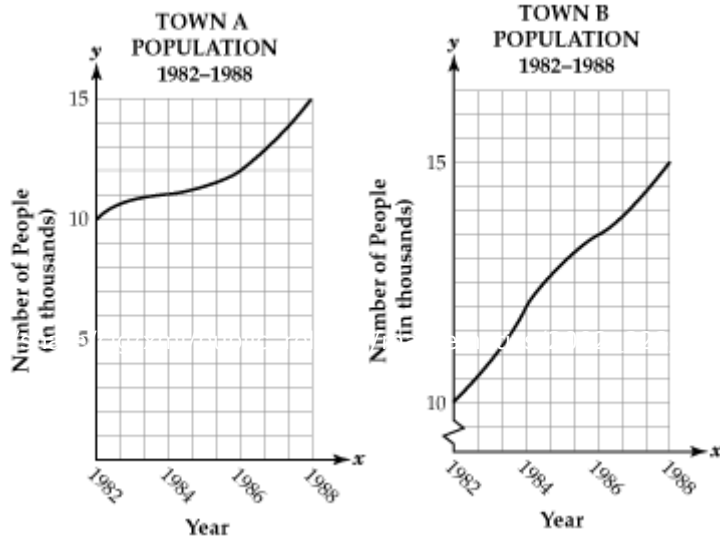
- A. computation is incorrect
- B. sample size is too large
- C. sample is biased
- D. sample is random

176. Monique found that 90% of the students in her computer applications class have computers at home. She then predicted that since there are 800 students in her school, about 720 of them have computers in their homes. Which of these best describes the reason that her prediction is not valid?

- A. use of opinion to influence a prediction
- B. incorrect arithmetic computation
- C. inappropriate use of mean
- D. biased sampling

177. The graphs below show the number of residents in Town A and Town B from the years 1982 to 1988. The two

towns have comparable populations. The mayor of Town B uses the graphs to claim that there was a larger increase in the number of residents in Town B than in Town A from the years 1982 to 1988.



According to the information given, which of these explains why the graphs are misleading?

- A. The time periods are different.
- B. The types of data are different.
- C. The vertical scales are different.
- D. The population of the towns are different.

178. Martin and Anna buy books at a sale. Martin buys 3 hardcover books and 4 paperback books for \$6.50. Anna buys 2 hardcover books and 6 paperback books for \$6.00. What is the cost, in dollars, of each hardcover book?

179. Sam needs to rent a van for a school field trip. Van Company A charges a one-time fee of \$250 plus \$10 for each mile driven. Van Company B charges a one-time fee of \$150 plus \$12 for each mile driven. Let x represent the number of miles driven. Let y represent the total cost, in dollars, to rent the van. Which system of equations models this situation?

- A. $y = 250 - 10x$
 $y = 150 - 12x$
- B. $y = 10x - 250$
 $y = 12x - 150$
- C. $y = 250x + 10$
 $y = 150x + 12$
- D. $y = 10x + 250$
 $y = 12x + 150$

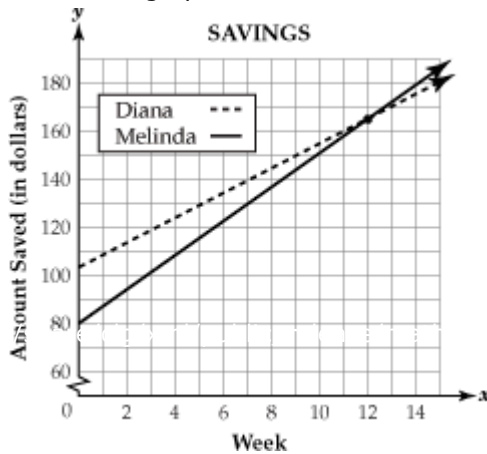
180. The graph below compares the income and expenses involved in the production and sales of

tennis shoes at a shoe factory.



How many pairs of tennis shoes must be sold for income and expenses to be equal?

181. The graph below shows the amount of money Diana and Melinda each saved during their summer vacation.



Which of these statements can be concluded from the graph?

- A. Diana will always have more money than Melinda.
- B. Diana will never have more money than Melinda.
- C. The amount of Melinda's savings becomes greater than Diana's after 12 weeks.
- D. The amount of Diana's savings becomes greater than Melinda's after 12 weeks.

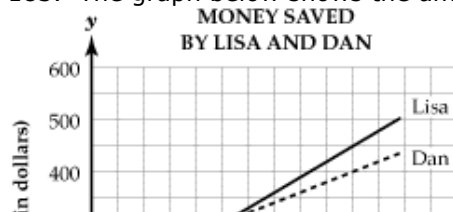
182. A telephone company offers customers two payment plans for monthly service.

Plan A costs \$5 per month plus \$0.10 per minute for calls.

Plan B costs \$8 per month plus \$0.07 per minute for calls.

- How many minutes of calls would it take for Plan A and Plan B to cost the same?

183. The graph below shows the amounts of money that Lisa and Dan saved during the summer.



How much money did they each have when their savings were equal?

- A. \$200
- B. \$300
- C. \$500
- D. \$600

184. The Sanchez family is planning a trip to an amusement park. The park has two ticket plans. Plan A offers a weekend pass for \$12 plus \$0.50 per ride. Plan B is \$1.25 for each ride.

Let x represent the number of rides each person will ride and y represent the cost per person, in dollars. Which of these systems of equations could be used to choose a ticket plan?

- A. $y = 0.50x + 12$
 $y = 1.25x$
- B. $y = 12x + 0.50$
 $y = x + 1.25$
- C. $y = 0.50x$
 $y = 1.25x$
- D. $y = x + 12$
 $y = x + 1.25$

185. Kareem is going to Florida. The cost for two different vacation packages is shown below.

FLORIDA VACATION PACKAGES

Package	A	B
Roundtrip Airfare Cost	\$150	\$210
Hotel Cost (per night)	\$55	\$40

How many nights would Kareem need to stay in a hotel to pay the same amount for either vacation package?

186. Mary graphed the system of equations below.

$$y = \frac{3}{2}x + \frac{7}{2}$$

$$y = -\frac{2}{3}x + \frac{7}{3}$$

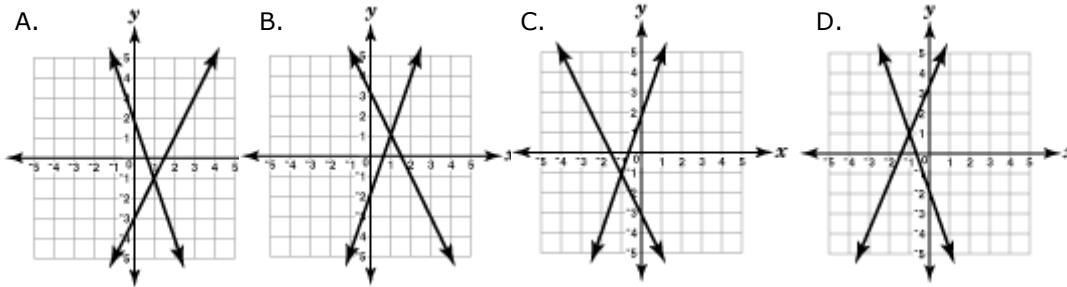
Which of these best describes the relationship between the two lines?

- A. They have no point in common.
- B. They have one point in common.
- B. They have two points in common.
- D. They have infinite points in common.

187. Look at the system of equations below.

$y = -3x + 2$ Which of these graphs represents this system of equations?

$y = 2x - 3$



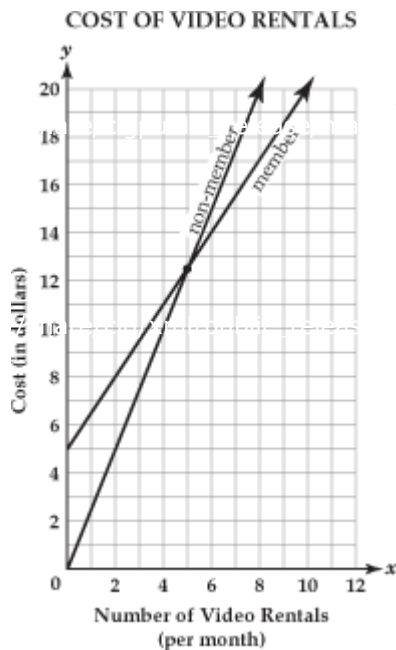
188. Look at the system of equations below.

$y = 3x - 2$
 $2y = 6x - 4$

Which of these describes this system?

- A. two parallel lines
- B. two equations of the same line
- C. two lines that intersect only at (1, 1)
- D. two lines that intersect only at (-1, -1)

189. The graph below shows the cost of video rentals for members and non-members of a video club.



According to the graph, which of these statements is true?

- A. members pay less for 4 movies
- B. non-members pay less for 5 movies
- C. non-members pay less for 6 movies
- D. members pay less for 8 movies

190. Monique bought 2 hot dogs and 1 large soda. She spent \$7. Scott bought 4 hot dogs and 1 large soda. He spent a total of \$12. What is the cost of each hot dog?

191. There are 26 students in an algebra class. The number of girls in the class is one less than twice the number of boys. How many boys are in the class?

192. A park ranger spent \$208 to buy 12 trees. Redwood trees cost \$24 each and spruce trees cost \$16 each. How many of each tree did the park ranger buy?

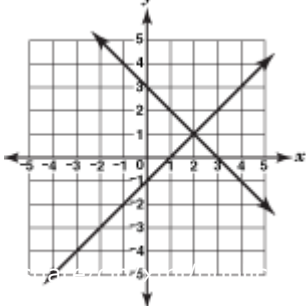
- A. 10 redwoods and 2 spruce
- B. 9 redwoods and 3 spruce
- C. 3 redwoods and 9 spruce
- D. 2 redwoods and 10 spruce

193. Information about fees for two health clubs is shown in the table below.

HEALTH CLUB PLANS		
	Initial Membership Fee	Monthly Fee
Arnold's Gym	\$200	\$25
Better Body Club	\$100	\$45

For what number of months is the total cost the same for both health clubs?

194. Look at the graph below.



Which of these statements describes the relationship between the two lines?

- A. They intersect at the point (2, 1).
- B. They intersect at the point (1, 2).
- C. They intersect at the point (1, 0).
- D. They intersect at the point (0, 3).

195. Russ worked a total of 135 hours during the month of July. He earned \$3,600. Russ earned \$25 per hour each weekday that he worked. He earned \$40 per hour each Saturday that he worked. Let x represent the number of weekday hours worked and y represent the number of Saturday hours worked. Which system of equations represents this situation?

- A. $x + y = 135$
 $25x + 40y = 3,600$
- B. $x + y = 135$
 $40x + 25y = 3,600$
- C. $x + y = 3,600$
 $25x + 40y = 135$
- D. $x + y = 3,600$
 $40x + 25y = 135$