Multiple Choice

1. Andrew has two jobs in sales. He earns a commission of 4% on sales at a clothing store and 5% commission on sales at a shoe store. Last week Andrew earned $700. What equation describes this situation?
   A. $4c + 0.5s = 700$
   B. $40c + 50s = 700$
   C. $0.04c + 0.05s = 700$
   D. $5s + 4c = 700$

2. The solution to $-2x - 4 = 2$ is:
   A. $x = 0$
   B. $x = -3$
   C. $x = 2$
   D. $x = 4$

3. The next step in the solution of $-x - 28 = 3x$ could be:
   A. $2x - 28 = 0$
   B. $-28 = 2x$
   C. $-x - 28 = 0$
   D. $-28 = 4x$

4. Daniel builds rocking chairs and tables in his shop. It takes him 4 h to build a rocking chair and 7 h to build a table. Last week he worked 50 h. What equation expresses the number of tables he made in terms of the number of rocking chairs?
   A. $t = \dfrac{50 - 4r}{7}$
   B. $r = \dfrac{50 - 7t}{4}$
   C. $50 - 4r = 7t$
   D. $4r + 7t = 50$

5. Which of the following is true for the graph of $3x + 4y = 24$?
   A. The slope is -3.
   B. The x-intercept is 8.
   C. The y-intercept is 8.
   D. $(3, 2)$ is a point on the graph.

6. Which equation will let you solve $12 - 3y = 5x$ for y?
   A. $-3y = 5x - 12$
   B. $y = \dfrac{12 - 5x}{-3}$
   C. $y = 5x + 4$
   D. $y = \dfrac{12 - 5x}{3}$

7. Which equation represents a line with slope -4 and a y-intercept of 3?
   A. $x = -4y + 3$
   B. $y = -4x + 3$
   C. $x - 4y + 3 = 0$
   D. $-4x + y + 3 = 0$

8. The slope m and y-intercept b of the line $4x + 3y + 1 = 0$ are:
   A. $m = -4, b = 1$
   B. $m = -\dfrac{4}{3}, b = -\dfrac{1}{3}$
   C. $m = \dfrac{4}{3}, b = \dfrac{1}{3}$
   D. $m = \dfrac{3}{4}, b = -1$

9. The slope of the line that passes through $(5, -3)$ and $(-2, -1)$ is:
   A. $\dfrac{2}{7}$
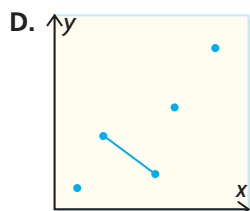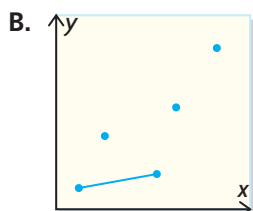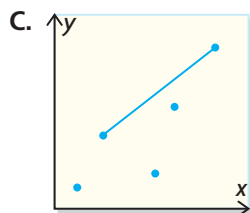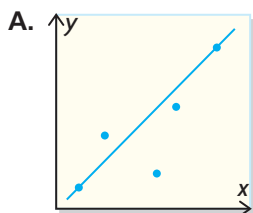   B. $-\dfrac{2}{7}$
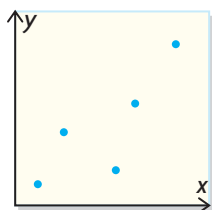   C. $\dfrac{7}{2}$
   D. $-\dfrac{7}{2}$

10. Which ordered pair is a solution to the pair of equations $3m + 2n = 13$ and $4m - 10 = n$?
   A. $(3, 2)$
   B. $(4, 6)$
   C. $(5, -1)$
   D. $(0, 5)$

11. The point $(5, 3)$ is the intersection of a pair of lines. If one line is represented by the equation $y = 2x - 7$, the equation of the other line is:
   A. $y = 3x + 8$
   B. $y = -x + 8$
   C. $y = 2x - 4$
   D. $y = x + 2$

12. Select the line that best represents the line of best fit for this scatter plot.

A.

**C.**

B.

D.

13. Which of the following pair of lines are perpendicular?
   A. line 1: $m = \dfrac{2}{3}$ and line 2: $m = \dfrac{3}{2}$
   B. line 1: $m = -\dfrac{3}{5}$ and line 2: $m = -\dfrac{3}{5}$
   C. line 1: $m = -\dfrac{4}{3}$ and line 2: $m = \dfrac{3}{4}$
   D. line 1: $m = \dfrac{7}{3}$ and line 2: $m = -\dfrac{7}{3}$

14. Which of these statements is true?
   A. The line of best fit is drawn before the scatter plot is prepared.
   B. The scatter plot is not required to draw the line of best fit.
   C. The scatter plot is prepared before the line of best fit is drawn.
   D. All the points of the scatter plot must lie on the line of best fit.

15. Use the line of best fit to predict the amount of rainfall for the ninth month of the year.

Rainfall Through the Year
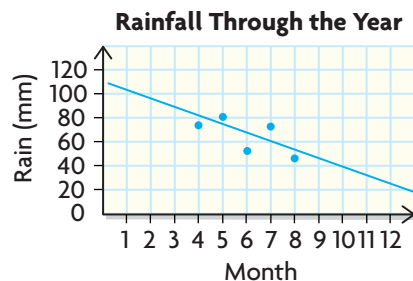
   A. 50 mm   **C.** 30 mm
   B. 40 mm   **D.** 20 mm

16. Suppose the pattern of the points in a scatter plot sloped up to the right. How can the relationship between the variables be described?
   A. As the independent variable increases, the dependent variable decreases.
   B. No relationship exists between the variables.
   C. As the independent variable increases, the dependent variable increases.
   D. As the independent variable increases, the dependent variable stays the same.

17. Which of the following pairs of lines are parallel and rise from left to right?
   A. line 1: m $= -5$ and line 2: m $= -5$
   B. line 1: m $= \dfrac{2}{3}$ and line 2: m $= -\dfrac{2}{3}$
   C. line 1: m $= -\dfrac{4}{5}$ and line 2: m $= -0.8$
   D. line 1: m $= \dfrac{5}{8}$ and line 2: m $= 0.625$

Investigation

When will women run faster than men?

For many years, the winning times for 100 m sprint at the Olympics have been dropping for both men and women. Some people claim that the female sprinters' times have been improving more quickly than the men's. They say that eventually, the fastest human on earth will be a woman.

	Women's 100 m Sprint			Men's 100 m Sprint		
Year	Sprinter		Time (s)	Sprinter		Time (s)
1936	Helen Stephens	USA	11.5	Jesse Owens	USA	10.3
1948	Fanny Blankers-Koen	NED	11.9	Harrison Dillard	USA	10.3
1952	Marjorie Jackson	AUS	11.5	Lindy Remigino	USA	10.4
1956	Betty Cuthbert	AUS	11.5	Bobby Morrow	USA	10.5
1960	Wilma Rudolph	USA	11.0	Armin Hary	FRG	10.2
1964	Wyomia Tyus	USA	11.4	Robert Hayes	USA	10.0
1968	Wyomia Tyus	USA	11.0	Jim Hines	USA	9.9
1972	Renate Stecher	GDR	11.07	Valeriy Borzov	URS	10.14
1976	Annegret Richter	FRG	11.08	Hassely Crawford	URS	10.08
1980	Lyudmila Kondratyeva	URS	11.06	Allan Wells	GBR	10.25
1984	Evelyn Ashford	USA	10.97	Carl Lewis	USA	9.99
1988	Florence Griffith-Joyner	USA	10.54	Carl Lewis	USA	9.92
1992	Gail Devers	USA	10.82	Linford Christie	GBR	9.96
1996	Gail Devers	USA	10.94	Donovan Bailey	CAN	9.84
2000	Marion Jones	USA	10.75	Maurice Greene	USA	9.87
2004	Yuliya Nesterenko	BLR	10.93	Justin Gatlin	USA	9.85

18. a) Use the data above to create a scatter plot for the 100 m winning times for women.
   b) Draw a line of best fit for the data.
   c) Repeat parts a) and b) for the men's times using the same grid.
   d) Use the graphs to predict if and when the women's winning time will be faster than the men's.
   e) Use the equations of the lines of best fit to validate your answer.