AMI—Algebra I: Day 1

1. Write an equation of the best-fit line in the form of $y = ax + b$. Estimate the score for the 15th game.

Game	1	2	3	4	5	6
Score	85	82	83	80	78	75

2. The table below shows Alex's best time for the 200-m sprint each year.

Year	1999	2000	2001	2002	2003	2004	2005	2006
Time (s)	29.95	30.40	32.10	32.05	31.75	32.95	33.40	35.60

Draw a scatter plot and determine what relationship, if any, exists in the data.

3. The cost of admission to an amusement park is \$9.50 plus \$1.50 per ride. Write a linear equation in slope-intercept form for the amount spent if r rides are taken.

4. Write the slope-intercept form of an equation for a line that passes through $(5, 7)$ with slope -9.

5. Write an equation and describe the slope for the line that passes through $(9, 22)$ and $(15, 36)$.

6. A company manufactured 324,000 computers in 2009. The company's output grows by 5,000 units per year.

Year	Production (thousands)
2009	324
2010	329
2011	334

Write a linear equation to find the company's production, P, in year, t.

7. In 1992, about 12.5 million people were using broadband Internet services. In 1999, the number was 17.4 million. Write a linear equation to predict the number of millions of people, P, who will be using broadband Internet services in year t.

Show all work **and** answers on the back of this page.

Standard Form

$Ax + By = C$

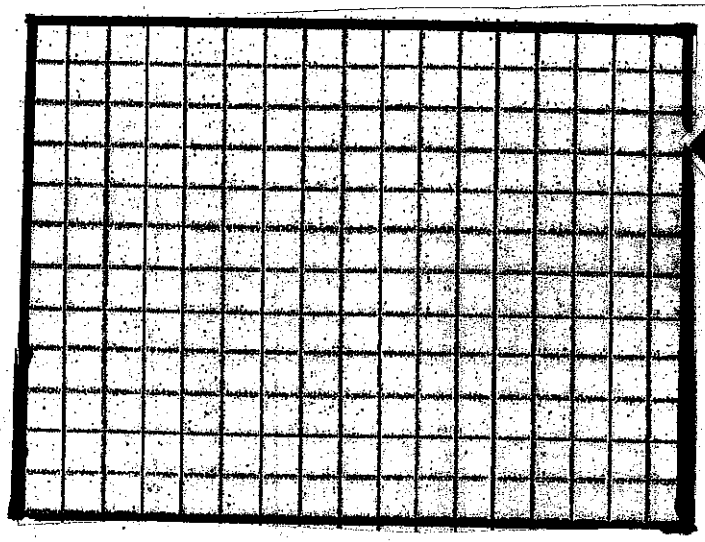
Slope intercept form

$y = mx + b$

Where (x,y) is an ordered pair on the line, m is the slope, and b is the y-intercept.

Slope $= m = \dfrac{y_2 - y_1}{x_2 - x_1}$

AMI— Algebra I: Day 2



The table shows the age of infants, t (in weeks), and the number of hours, h, they slept in a day.

Age (weeks)	3	5	8	9	11	13	15	18	19	21
Sleep (h)	15.2	14.8	14.3	14.8	14.5	13.9	13.4	13.2	13.7	13.2

8. Draw a scatter plot and determine what relationship exists, if any, in the data.

9. Find an equation for the line that has an x-intercept of 3 and is perpendicular to the graph of $-2x + 5y = 6$.

10. Determine whether $y = 4x + 5$ and $y = \frac{1}{4}x - 2$ are perpendicular. Explain.

11. Write an equation for the line that passes through $\left(\frac{1}{4}, \frac{2}{5}\right)$ and $\left(\frac{3}{4}, \frac{7}{5}\right)$.

12. A line passes through $\left(-\frac{2}{9}, -\frac{4}{5}\right)$ with slope $\frac{1}{5}$. Write the slope-intercept form, of an equation for line l.

13. The monthly telephone bill consists of $24 service charge plus $1.20 per call. Write an equation in slope-intercept form for the total monthly bill if x represents the number of calls made in a month.

14. Write an equation of the best-fit line in the form of $y = ax + b$.

Month	1	2	3	4	5	6
Units Produced	275	400	612	867	1,020	1,465

15. Find the inverse of the relation.

x	y
–4	0
12	9
–6	–6
7	–11

Show all work **and** answers on the back of this page.

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Slope intercept form

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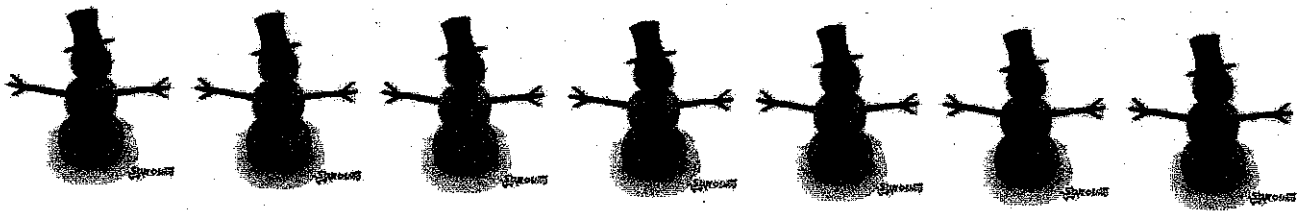
Slope = m = $\frac{y_2 - y_1}{x_2 - x_1}$



AMI— Algebra I: Day 3

Write . . *equation in standard form.*

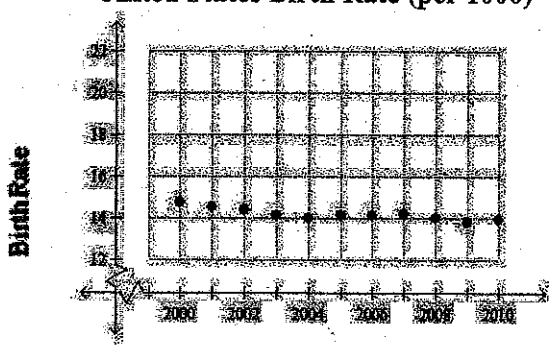
16. $y + 5 = \frac{1}{2}(x - 9)$

a. $x - 2y = 1$ b. $x - 2y = 19$

c. $y = \frac{1}{2}x - \frac{19}{2}$ d. $x + 2y = -19$

17.

United States Birth Rate (per 1000)



Year

Source: National Center for Health Statistics, U.S. Dept. of Health and Human Services

a. no correlation

b. positive correlation; as time passes, the birth rate increases.

c. positive correlation; as time passes, the birth rate decreases.

d. negative correlation; as time passes, the birth rate decreases.

United States Birth Rate

Year	2000	2001	2002	2003	2004	2005	2006	2007	2008	2
Birth Rate (per 1000)	14.7	14.5	14.4	14.1	14.0	14.1	14.1	14.2	14.0	:

Source: National Center for Health Statistics, U.S. Dept. of Health Services

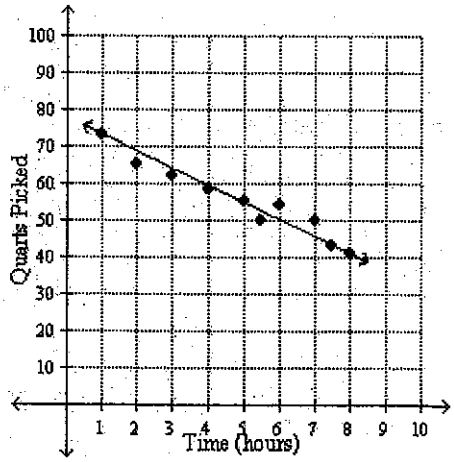
18. Let x represent the number of years since 2000 with $x = 0$ representing 2000. Let y represent the birth rate per 1000 population. Write the slope-intercept form of the equation for the line of fit using the points representing 2001 and 2009. Round to the nearest hundredth.

a. $y = -0.09x + 14.59$ b. $y = 0.09x + 14.59$

c. $y = -0.09x - 14.59$ d. $x = -0.09y + 14.59$

Use the scatter plot that shows the number of quarts of strawberries picked each hour.

Strawberries Picked



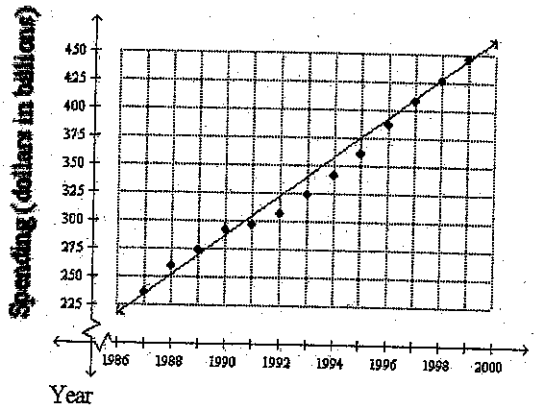
19. Predict the number of quarts that will be picked in the tenth hour.

Write an equation of the line with the given slope and y-intercept.

20. slope: –2, y-intercept: 7.4

Use the scatter plot that shows the domestic traveler spending.

Domestic Traveler Spending in the U.S., 1987-1999



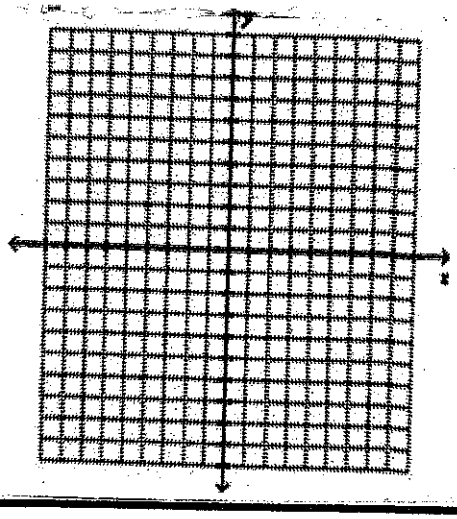
Source: The World Almanac, 2003

21. Use the points (1987, 235) and (1999, 446) to write the slope-intercept form of an equation for the line of fit shown in the scatter plot.

22. Graph the equation using the slope and y-intercept.

$x - y = -10$

a.



Standard Form

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Slope intercept form

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Where (x,y) is an ordered pair on the line, m is the slope, and b is the y-intercept.

$$\text{Slope} = m = \frac{y_2 - y_1}{x_2 - x_1}$$

AMI— Algebra I: Day 4

Show all work **and** answers on the back of this page.

Slope intercept form

y= mx +b

Where (x,y) is an ordered pair on the line, m is the slope, and b is the y-intercept.

$$\text{Slope} = m = \frac{y_2 - y_1}{x_2 - x_1}$$

Solve for an x or y in an ordered pair that varies directly.

$$\frac{y_1}{x_1} = \frac{y_2}{x_2}$$

1. A paper airplane is thrown off a 71-foot-high bridge. As the paper airplane flies, its height decreases at a steady rate.

Time (s)	0	5	10	15	20
Height (ft)	71	56	41	26	11

What would be the height of the airplane after 3 seconds? 12 seconds?

2. At a ski resort there was 10 feet of snow on the ground. A blizzard blew in and dumped 3 inches of snow per hour. The function $y = \frac{1}{4}x + 10$ represents the total feet of snow y after snowing for x hours. If the blizzard started at 12:00 noon, at what time would there be $11\frac{3}{4}$ feet of snow on the ground?

Suppose y varies directly as x.

3. If $y = 35$ when $x = 14$, find y when $x = 41$.

4. The cab fare varies directly with the number of miles driven, as shown in the table.

Miles Driven	1	2	3	4	5
Cab Fare	$1.25	$2.50	$3.75	$5.00	$6.25

Write an equation that relates the cab fare, y, to the miles driven, x.

Suppose y varies directly as x.

5. If $y = -4$ when $x = 1$, find y when $x = 3$.

AMI— Algebra I: Day 5

Show all work **and** answers on the back of this page.

Slope intercept form

y= mx +b

Where (x,y) is an ordered pair on the line, m is the slope, and b is the y-intercept.

$$\textbf{Slope} = m = \frac{y_2 - y_1}{x_2 - x_1}$$

Solve for an x or y in an ordered pair that varies directly.

$$\frac{y_1}{x_1} = \frac{y_2}{x_2}$$

7. Find the x- and y-intercepts of the graph of $5x + y = 7$

8. Aponi has joined a new job. She is paid $8.50 an hour. She has been told that every year she will receive a raise of $1.50 an hour. What will her hourly wage be during the seventh year?

Suppose y varies directly as x.

9. If $y = 8$ when $x = 6$, find y when $x = 9$.

10. Alex owes his father $100. His father pays him $12.50 an hour to work at their family store. The function $d = 100 - 12.5h$ represents the amount of debt d Alex has left after working h hours. Find the zero and explain what it means in the context of this situation.

11. Peter had $20 when he arrived at the bowling alley. He rented shoes for $3 and each game cost $3.75. The function $y = 17 - 3.75x$ represents the amount of money y he had remaining after bowling x games. Find the zero

12. A country paid $541 million in interest on its national debt in 1940 and $1,291 million in 1970. What was the annual rate of change from 1940 to 1970?

13. Find the x- and y-intercepts of the graph of $\frac{5}{4}x + \frac{3}{2}y = 9$.

14. Find the x- and y-intercepts of the graph of $\frac{2}{3}x - \frac{3}{5}y = \frac{5}{3}$.