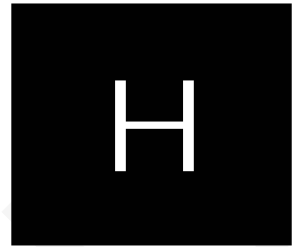


Name

RELEASED FORM

Algebra I

Form H



# North Carolina Test of Algebra I

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Public Schools of North Carolina  
[www.ncpublicschools.org](http://www.ncpublicschools.org)  
State Board of Education  
Department of Public Instruction  
Division of Accountability Services/North Carolina Testing Program  
Raleigh, North Carolina 27699-6314



1. Simplify:

$$\frac{64x^5}{4x^2}$$

- A  $60x^{2.5}$
- B  $60x^3$
- C  $16x^{2.5}$
- D  $16x^3$

2. If  $y$  varies directly as  $x$ , and  $y = 12$  when  $x = 72$ , then what is the value of  $x$  when  $y = 3$ ?

- A 18
- B 2
- C  $\frac{1}{2}$
- D  $\frac{1}{6}$

3. Which expression is the greatest common factor of  $(125t^3m^5 + 60t^4m^4 + 85t^5m^2)$ ?

- A  $5t^3m^2$
- B  $5t^4m^2$
- C  $5t^4m^4$
- D  $5t^5m^5$

4. The balance,  $B_{n+1}$ , in Mr. Smith's savings account at the end of a year is calculated by the equation  $B_{n+1} = (1.065)B_n$ , where  $B_n$  is the balance at the end of the previous year. Mr. Smith made a deposit to open the account 4 years ago. He has not made any additional deposits or withdrawals since. The balance at the end of 2 years was \$1,701.34. What is the balance at the end of 4 years?

- A \$1,922.51
- B \$1,929.70
- C \$2,143.69
- D \$2,188.72

5. On a map, Luis's house is located at  $(-7, 6)$  and Melvin's house is at  $(4, -5)$ . What are the coordinates for Raquel's home if she lives exactly halfway between Luis and Melvin?

- A  $(6, -5.5)$   
B  $(-1.5, 0.5)$   
C  $(-3, 1)$   
D  $(-5.5, 0.5)$
- 

6. The matrix below shows the yearly sales of belts, hats, pants, and shirts at a local store over three years.

|               | <b>Year 1</b> | <b>Year 2</b> | <b>Year 3</b> |
|---------------|---------------|---------------|---------------|
| <b>Belts</b>  | 1,240         | 1,450         | 1,102         |
| <b>Hats</b>   | 1,655         | 1,988         | 2,133         |
| <b>Pants</b>  | 2,678         | 3,131         | 2,965         |
| <b>Shirts</b> | 4,544         | 4,417         | 4,782         |

Which item shows a decrease in yearly sales from Year 1 to Year 2?

- A Belts  
B Hats  
C Pants  
D Shirts

7. Matrix  $X$  and matrix  $Y$  represent the inventories of two stores.

$$X = \begin{bmatrix} 26 & 37 \\ 18 & 49 \\ 95 & 60 \end{bmatrix} \quad Y = \begin{bmatrix} 15 & 23 \\ 26 & 48 \\ 81 & 55 \end{bmatrix}$$

Which matrix,  $S$ , lists their combined inventories?

A  $\begin{bmatrix} 11 & 14 \\ 8 & 1 \\ 14 & 5 \end{bmatrix}$

B  $\begin{bmatrix} 26 & 23 \\ 18 & 48 \\ 95 & 55 \end{bmatrix}$

C  $\begin{bmatrix} 41 & 60 \\ 44 & 97 \\ 176 & 115 \end{bmatrix}$

D  $\begin{bmatrix} 390 & 851 \\ 468 & 2,352 \\ 7,695 & 3,300 \end{bmatrix}$

8. A caterer's recipes are each designed to make 4 servings. The ingredients are shown in the matrix below.

|                     | Cake | Bread | Cookies |
|---------------------|------|-------|---------|
| <b>Eggs</b>         | 3    | 2     | 1       |
| <b>Flour (cups)</b> | 3    | 4     | 2       |
| <b>Sugar (cups)</b> | 2    | 1     | 0.5     |

How much flour is needed to make 60 servings of bread and 60 servings of cake?

- A 7 cups
- B 9 cups
- C 105 cups
- D 420 cups

9. Given  $X = \begin{bmatrix} 2 & 3 & 1 \\ -1 & 5 & 4 \end{bmatrix}$  and  $Y = \begin{bmatrix} 6 & 0 & -2 \\ 4 & 1 & 5 \end{bmatrix}$ . What is  $2X - 3Y$ ?

- A  $\begin{bmatrix} -14 & 6 & 8 \\ -14 & 7 & -7 \end{bmatrix}$
- B  $\begin{bmatrix} 22 & 6 & -4 \\ 10 & 13 & 23 \end{bmatrix}$
- C  $\begin{bmatrix} -14 & 3 & 8 \\ -14 & 7 & -7 \end{bmatrix}$
- D  $\begin{bmatrix} 22 & 9 & -4 \\ 10 & 13 & 23 \end{bmatrix}$

10. The chart below shows the latitudes and average January temperatures for 8 cities.

| City             | Latitude | Average January Temperature |
|------------------|----------|-----------------------------|
| Albany, NY       | 43°      | 22°F                        |
| Baltimore, MD    | 39°      | 32°F                        |
| Boston, MA       | 42°      | 29°F                        |
| Columbia, SC     | 34°      | 47°F                        |
| Philadelphia, PA | 40°      | 33°F                        |
| Raleigh, NC      | 36°      | 40°F                        |
| Savannah, GA     | 32°      | 49°F                        |
| Tampa, FL        | 28°      | 61°F                        |

According to the line of best fit, what is the *approximate* decrease in average temperature per degree change in latitude?

- A 5°
- B 4°
- C 2°
- D 1°

11. In the formula  $A = P(1 + r)^t$ ,  $P$  is the principal,  $r$  is the annual rate of interest, and  $A$  is the amount after  $t$  years. An account earning interest at a rate of 4% has a principal of \$500,000. If no more deposits or withdrawals are made, **about** how much money will be in the account after five years?

A \$705,200  
B \$620,700  
C \$608,300  
D \$575,000

12. Given:

$$\begin{aligned}2x + 3y &= 12 \\2x - y &= 4\end{aligned}$$

What is the value of  $x + y$ ?

A -5  
B -1  
C 1  
D 5

13. The height,  $h(t)$ , in feet of an object thrown into the air with an initial upward velocity of 63 feet per second is given by the formula  $h(t) = -16t^2 + 63t$ , where  $t$  is the time in seconds. What is the height of the object after 3 seconds?

A 45 ft  
B 59 ft  
C 81 ft  
D 93 ft

14. A taxi ride cost \$29.40. The driver charged \$3 plus \$0.40 per 0.2 mile traveled. How far did the taxi travel on this trip?

A 9.8 miles  
B 13.2 miles  
C 66 miles  
D 73.5 miles

15. The average price of a movie ticket in the year 2000 was \$5.39. The average price of a movie ticket in the year 2004 was \$6.21. Assuming the increase is linear, what would be the **approximate** price of a movie ticket in the year 2009?

A \$6.42  
B \$7.03  
C \$7.24  
D \$8.06

16. What is the value of  $y$  in the system of equations below?

$$\begin{aligned}2x + 6y &= 9 \\ y &= -\frac{1}{2}x + 2\end{aligned}$$

A  $-7$   
B  $0.5$   
C  $3$   
D  $5.5$

17. A car's speed before a sudden stop can be estimated by the formula

$$S = \sqrt{30gk}, \text{ where}$$

$S$  = speed of the car in mph,  
 $g$  = drag factor, and  
 $k$  = length of skid mark in feet.

The drag factor during a recent crash was 0.8. What was the **approximate** speed of the car if it created skid marks 193 feet long?

- A 34 mph  
B 58 mph  
C 68 mph  
D 85 mph
18. Multiply:  $(3x - 4)(6x + 7)$
- A  $9x^2 + 3$   
B  $18x^2 - 28$   
C  $18x^2 - 3x - 28$   
D  $18x^2 + 3x - 28$

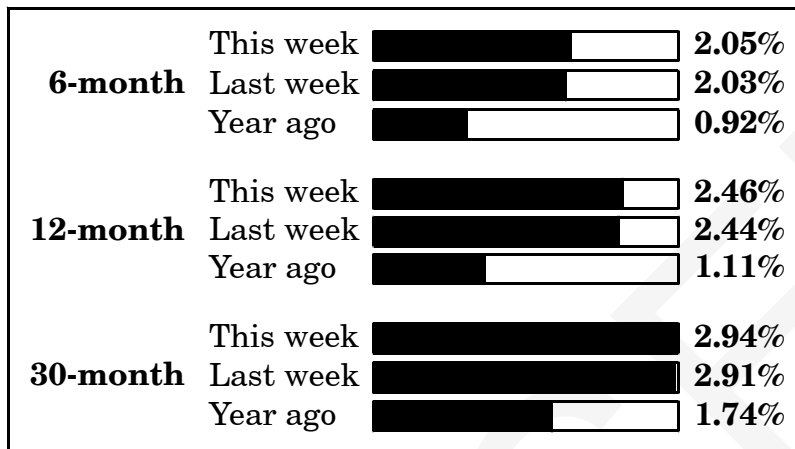
19. The formula  $P = \frac{96.3F}{SL}$  can be used to calculate the precipitation rate at which sprinklers spread water. In the formula,  $P$  is the precipitation rate,  $F$  is the rate of water flow,  $S$  is the amount of space between each sprinkler, and  $L$  is the space between two rows of sprinklers. If the space between each sprinkler is 6, and the space between rows is 7, what is the **approximate** rate of water flow that will result in a precipitation rate of 20?

- A 0.3  
B 8.7  
C 31.3  
D 45.9

20. At the airport, the new runway will be parallel to a nearby highway. On the scale drawing of the airport, the equation that represents the highway is  $6y = 8x - 11$ . Which equation could represent the new runway?
- A  $9y = 12x + 5$
- B  $9x = 12y + 8$
- C  $12y = -9x + 2$
- D  $12x = -9y + 4$
21. The midpoint of  $\overline{XY}$  is point  $M(-12, 5)$ . If the coordinates of  $X$  are  $(3, -3)$ , what are the coordinates of  $Y$ ?
- A  $(-4.5, 1)$
- B  $(-7.5, 4)$
- C  $(-15, 8)$
- D  $(-27, 13)$

22. The average interest rates for certificates of deposit are given in percents in the graph below.

**Average Interest Rates**



Which matrix correctly displays the average interest rates?

A

|                 | This week | Last week | Year ago |
|-----------------|-----------|-----------|----------|
| <b>6-month</b>  | 2.05      | 2.03      | 0.92     |
| <b>12-month</b> | 2.46      | 2.44      | 1.11     |
| <b>30-month</b> | 2.94      | 2.91      | 1.74     |

B

|                 | This week | Last week | Year ago |
|-----------------|-----------|-----------|----------|
| <b>6-month</b>  | 2.05      | 2.46      | 2.94     |
| <b>12-month</b> | 2.03      | 2.44      | 2.91     |
| <b>30-month</b> | 0.92      | 1.11      | 1.74     |

C

|                 | This week | Last week | Year ago |
|-----------------|-----------|-----------|----------|
| <b>6-month</b>  | 0.92      | 2.03      | 2.05     |
| <b>12-month</b> | 1.11      | 2.44      | 2.46     |
| <b>30-month</b> | 1.74      | 2.91      | 2.94     |

D

|                 | This week | Last week | Year ago |
|-----------------|-----------|-----------|----------|
| <b>6-month</b>  | 0.92      | 1.11      | 1.74     |
| <b>12-month</b> | 2.03      | 2.44      | 2.91     |
| <b>30-month</b> | 2.05      | 2.46      | 2.94     |

23. Matrix  $G$  shows the number of students at a gym in the year 2000. Matrix  $M$  shows the number of students at the same gym in 2005.

|              | <b>boys</b>       | <b>girls</b> |  | <b>boys</b>       | <b>girls</b> |
|--------------|-------------------|--------------|--|-------------------|--------------|
| Matrix $G$ : | <b>ages 2–5</b>   | 18           |  | <b>ages 2–5</b>   | 24           |
|              | <b>ages 6–10</b>  | 21           |  | <b>ages 6–10</b>  | 26           |
|              | <b>ages 11–15</b> | 16           |  | <b>ages 11–15</b> | 13           |

Which matrix represents the change from 2000 to 2005?

A  $\begin{bmatrix} -8 & 6 \\ 0 & 8 \\ -10 & -16 \end{bmatrix}$

B  $\begin{bmatrix} 6 & -8 \\ 5 & -3 \\ -3 & 9 \end{bmatrix}$

C  $\begin{bmatrix} 21 & 26 \\ 21 & 26 \\ 16 & 32 \end{bmatrix}$

D  $\begin{bmatrix} 39 & 50 \\ 39 & 47 \\ 29 & 55 \end{bmatrix}$

24. Simplify:  $5\begin{bmatrix} 1 & -2 \\ 0 & 3 \end{bmatrix} - 2\begin{bmatrix} 6 & -1 \\ 4 & -2 \end{bmatrix}$

A  $\begin{bmatrix} -7 & -8 \\ -8 & 19 \end{bmatrix}$

B  $\begin{bmatrix} -7 & -1 \\ -8 & 5 \end{bmatrix}$

C  $\begin{bmatrix} -15 & -3 \\ -12 & 15 \end{bmatrix}$

D  $\begin{bmatrix} -15 & -1 \\ -12 & 5 \end{bmatrix}$

25. The table below displays the average number of pounds of milk and milk fat produced per cow in seven states in 2001.

| State     | Pounds of Milk | Pounds of Milk Fat |
|-----------|----------------|--------------------|
| Colorado  | 21,400         | 760                |
| Georgia   | 16,700         | 607                |
| Maryland  | 15,800         | 578                |
| Nebraska  | 16,200         | 601                |
| Oklahoma  | 14,500         | 524                |
| Tennessee | 14,500         | 530                |
| Utah      | 17,600         | 640                |

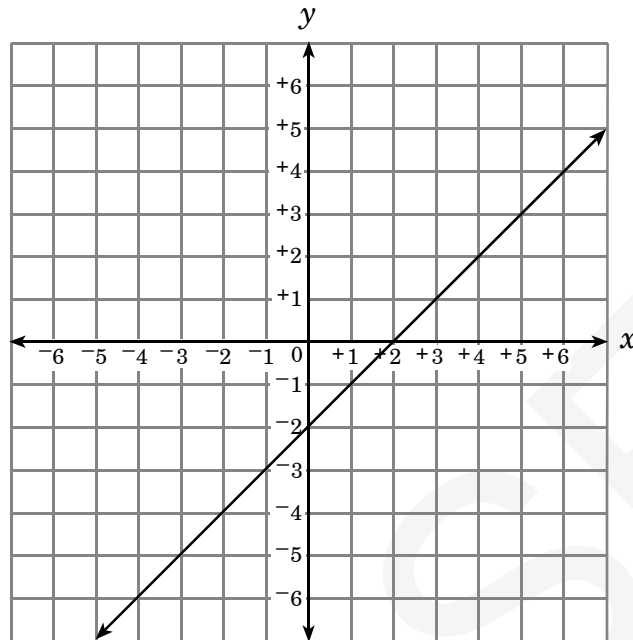
Source: National Agricultural Statistics Service,  
U.S. Department of Agriculture

In North Carolina in 2001, the production of milk per cow was 17,200 pounds. According to the line of best fit for the data above, *approximately* how many pounds of milk fat were produced per cow in North Carolina?

- A 543
- B 560
- C 610
- D 623
- 
26. Mr. Hanson recorded the typing speeds (in words per minute) of 25 students and their weeks of experience. The line of best fit for the data is  $y = 4.4x + 18.9$ , where  $x$  is the number of weeks of experience of a student and  $y$  is the student's typing speed. What is the meaning of the  $y$ -intercept for this set of data?
- A the average typing speed of the students
- B the highest typing speed recorded
- C the improvement in typing speed per week for the average student
- D the typing speed of a student with no experience

27. Suppose a ball is dropped from a height of 6 meters and bounces to 90% of its previous height after each bounce. Using the formula  $h = 6(0.9)^n$ , where  $n$  represents the number of bounces and  $h$  represents the maximum height of the ball after the  $n$ th bounce, what is the **approximate** maximum height of the ball after the 12th bounce?
- A 1.37 meters  
B 1.53 meters  
C 1.69 meters  
D 1.88 meters
28. Martha has \$180. She needs a total of \$2,000 to start an account. She earns \$60 per day working, of which she saves \$50. Which equation can she use to determine the number of days,  $d$ , she needs to work to reach her goal of \$2,000?
- A  $2,000 = 60d + 180$   
B  $2,000 = 60d - 180$   
C  $2,000 = 50d + 180$   
D  $2,000 = 50d - 180$
29. Maria sells paintings in an art gallery. She earns \$375 each week plus a commission equal to 2.5% of her sales. This week her goal is to earn at least \$500. What is the **minimum** amount of sales she must have this week to achieve her goal?
- A \$3,500  
B \$5,000  
C \$15,000  
D \$20,000

30. For the line graphed below, the  $x$ -intercept is changed to  $-2$  and the slope is unchanged.



How will the graph of the line change?

- A The new line will be parallel to the original line.
- B The new line will be perpendicular to the original line.
- C The new line will intersect the original line.
- D The new line will be the same line as the original line.

31. Solve:  $x^2 - 7x + 10 = 28$

- A  $\{-4, -7\}$
- B  $\{-2, 9\}$
- C  $\{5, 2\}$
- D  $\{30, 33\}$

32. Given the system of equations:

$$\begin{aligned} 6x + y &= 9.7 \\ 4x + 2y &= 9.8 \end{aligned}$$

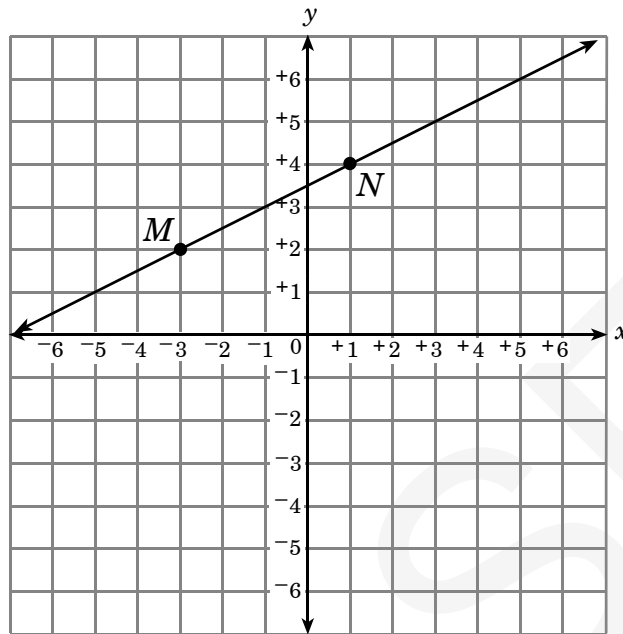
What is the value of  $x$ ?

- A 1.0
- B 1.2
- C 1.9
- D 2.5

33. Simplify:  $(2x^0y)(-3xy^5)$
- A  $-3y^6$
  - B  $-6y^5$
  - C  $-3xy^5$
  - D  $-6xy^6$
34. The cost of mailing a box varies directly with the weight of the box in pounds. It costs \$8 to mail a 5-pound box. How much would it cost to mail a 12-pound box?
- A \$19.20
  - B \$16.00
  - C \$15.00
  - D \$7.50
35. Which expression is equivalent to  $(x + 3)(3x^2 - 4x - 5)$ ?
- A  $3x^3 + 5x^2 - 17x - 15$
  - B  $3x^3 + 9x^2 - 13x - 15$
  - C  $3x^3 + 9x^2 - 5x - 15$
  - D  $3x^3 + 13x^2 - 17x - 15$

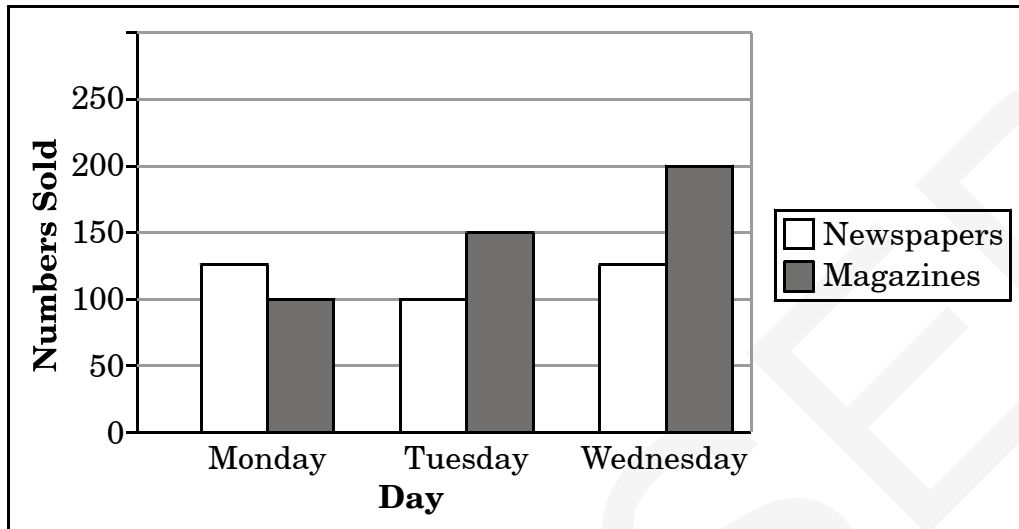
36. Each year, Cathy invests \$1,200 in her account. The account pays an interest rate of 6.3%. The formula to calculate the balance in her account is  $B = \frac{A(1 + r)^{n+1} - A}{r}$ , where
- $A$  is the amount invested per year,  $r$  is the interest rate, and  $n$  is the number of years investing.
- Approximately** how much will Cathy have in her account after 45 years?
- A \$217,000
  - B \$248,000
  - C \$279,000
  - D \$297,000
37. The endpoints of  $\overline{GH}$  are  $G(-3, 7)$  and  $H(2, 9)$ . What are the coordinates of the midpoint of  $\overline{GH}$ ?
- A  $(8, \frac{-1}{2})$
  - B  $(\frac{-1}{2}, 8)$
  - C  $(-1, \frac{-5}{2})$
  - D  $(\frac{-5}{2}, -1)$

38. Which is an equation of a line that is parallel to  $\overleftrightarrow{MN}$ ?



- A  $2x - y = 3$
- B  $x - 2y = 3$
- C  $8x + 4y = 4$
- D  $9x + 18y = -9$

39. The graph below displays the number of newspapers and magazines sold at a store for three days in one week.



Which matrix correctly displays this information?

A

|           | Newspapers | Magazines |
|-----------|------------|-----------|
| Monday    | 100        | 125       |
| Tuesday   | 100        | 150       |
| Wednesday | 125        | 200       |

B

|           | Newspapers | Magazines |
|-----------|------------|-----------|
| Monday    | 100        | 100       |
| Tuesday   | 125        | 125       |
| Wednesday | 150        | 200       |

C

|           | Newspapers | Magazines |
|-----------|------------|-----------|
| Monday    | 125        | 100       |
| Tuesday   | 100        | 150       |
| Wednesday | 125        | 200       |

D

|           | Newspapers | Magazines |
|-----------|------------|-----------|
| Monday    | 125        | 100       |
| Tuesday   | 150        | 100       |
| Wednesday | 200        | 125       |

40. An algebra teacher recorded the number of boys and girls absent in her class last week. On Monday, 3 boys and 2 girls were absent. On Tuesday, 1 boy and no girls were absent. On Wednesday, no boys and 5 girls were absent. On Thursday, no boys or girls were absent. On Friday, 1 boy and 3 girls were absent. Which matrix correctly displays the number of boys and girls absent each day last week?

A  $\begin{bmatrix} 3 & 2 & 1 & 0 & 0 \\ 5 & 0 & 0 & 1 & 3 \end{bmatrix}$

B  $\begin{bmatrix} 3 & 1 & 5 & 0 & 3 \\ 2 & 0 & 0 & 0 & 1 \end{bmatrix}$

C  $\begin{bmatrix} 3 & 1 & 0 & 0 & 1 \\ 2 & 0 & 5 & 0 & 3 \end{bmatrix}$

D  $\begin{bmatrix} 3 & 0 & 1 & 0 & 0 \\ 1 & 0 & 2 & 5 & 3 \end{bmatrix}$

41. Mr. Vang sells guitars, drums, and violins. The matrix below displays the sales for March and April.

|              | Guitars                                      | Drums | Violins |
|--------------|--|-------|---------|
| <b>March</b> | $\begin{bmatrix} 27 & 51 & 75 \end{bmatrix}$ |       |         |
| <b>April</b> | $\begin{bmatrix} 42 & 93 & 60 \end{bmatrix}$ |       |         |

In May and June his sales are a third of March's sales and April's sales, respectively. Which matrix displays the sales for May and June?

A

|             | Guitars                                      | Drums | Violins |
|-------------|--|-------|---------|
| <b>May</b>  | $\begin{bmatrix} 9 & 17 & 25 \end{bmatrix}$  |       |         |
| <b>June</b> | $\begin{bmatrix} 14 & 31 & 20 \end{bmatrix}$ |       |         |

B

|             | Guitars                                      | Drums | Violins |
|-------------|--|-------|---------|
| <b>May</b>  | $\begin{bmatrix} 9 & 51 & 75 \end{bmatrix}$  |       |         |
| <b>June</b> | $\begin{bmatrix} 14 & 93 & 60 \end{bmatrix}$ |       |         |

C

|             | Guitars   | Drums | Violins |
|-------------|---|-------|---------|
| <b>May</b>  | $\begin{bmatrix} 81 & 153 & 225 \end{bmatrix}$  |       |         |
| <b>June</b> | $\begin{bmatrix} 126 & 279 & 180 \end{bmatrix}$ |       |         |

D

|             | Guitars                                       | Drums | Violins |
|-------------|---|-------|---------|
| <b>May</b>  | $\begin{bmatrix} 81 & 51 & 75 \end{bmatrix}$  |       |         |
| <b>June</b> | $\begin{bmatrix} 126 & 93 & 60 \end{bmatrix}$ |       |         |

42. What value of  $x$  makes the equation true?

$$3 \begin{bmatrix} 5 & -1 \\ x & 2 \end{bmatrix} - \begin{bmatrix} 4 & 6 \\ -3 & 8 \end{bmatrix} = \begin{bmatrix} 11 & -9 \\ 9 & -2 \end{bmatrix}$$

- A 0  
B 2  
C 4  
D 6
43. The equation  $y = 461.19x + 3,492$  represents the value of a work of art from 1964 to 2005. What does the number 461.19 represent?
- A value of the work of art in 1964  
B value of the work of art in 2005  
C yearly decrease in value  
D yearly increase in value

44. A computer is purchased for \$1,200 and depreciates at \$140 per year. Which linear equation represents the value,  $V$ , of the computer at the end of  $t$  years?

- A  $V = 1,200 - 140t$   
B  $V = 140t$   
C  $V = 140t - 1,200$   
D  $V = 140(1,200 - t)$

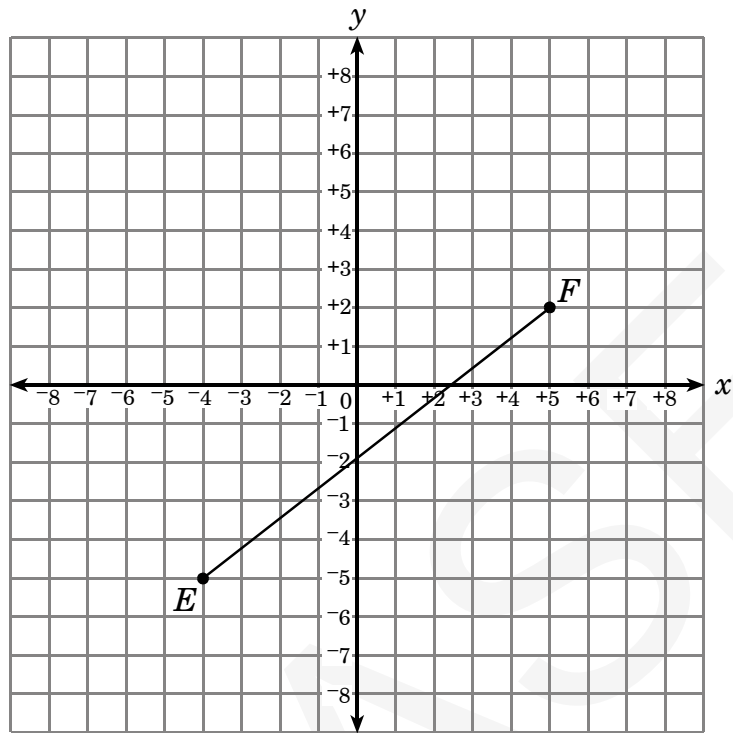
45. An object is dropped from a tall building. Suppose the distance it travels is given by the formula  $d = 16t^2$ , where  $d$  represents the distance in feet and  $t$  represents time in seconds. **About** how long does it take the object to fall 800 feet?

- A 2 seconds  
B 3 seconds  
C 5 seconds  
D 7 seconds

46. Henry wants to join a book-of-the-month club. The first club costs \$40 to join and \$10 per book. The second club costs \$15 per book and has no fee to join. How many books would need to be purchased from each club for the clubs to cost the same?
- A 15  
B 10  
C 8  
D 6
47. A group of 3 children and 2 adults pay a total of \$120 to take a karate class. A group of 5 children and 1 adult take the same karate class for \$95. What is the total cost for 1 child and 1 adult to take the karate class?
- A \$60  
B \$55  
C \$51  
D \$48
48. For the line  $y = mx + b$ , where  $m > 0$  and  $b < 0$ , what change would occur if  $b$  is multiplied by  $-1$  and  $m$  remains the same?
- A The  $y$ -intercept would become negative.  
B The slope would become negative.  
C The resulting line would be perpendicular to the original line.  
D The resulting line would be parallel to the original line.

49. The Outboard Motor Company can produce 50 motors in 4 weeks. Assuming a direct variation, how many motors can the company produce in 10 weeks?
- A 75 motors  
B 125 motors  
C 150 motors  
D 200 motors
50. The value,  $V_{n+1}$ , of a particular car is related to the previous year's value,  $V_n$ , by the function  $V_{n+1} = (1 - 0.15)V_n$ . Which statement **best** describes the change in the car's value from one year to the next?
- A The value is decreasing by 15%.  
B The value is increasing by 15%.  
C The value is decreasing by 85%.  
D The value is increasing by 85%.
51. What is the greatest common factor of  $63r^2t^3 + 42r^3t^5$ ?
- A  $21r^2t^3$   
B  $21rt$   
C  $7r^2t^3$   
D  $7rt$
52. Simplify:  
 $a + 4(6a + 2b^2) + (a^2 - 6b^2)$
- A  $25a^2 + 2b^2$   
B  $25a^2 - 4b^2$   
C  $a^2 + 25a - 4b^2$   
D  $a^2 + 25a + 2b^2$

53. What is the length of  $\overline{EF}$ ?



- A  $\sqrt{10}$  units
- B  $\sqrt{130}$  units
- C  $2\sqrt{34}$  units
- D  $4\sqrt{34}$  units

54. On a map of downtown, 12th Street is perpendicular to Avenue J. The equation  $y = -4x + 3$  represents 12th Street. What is the equation representing Avenue J if it passes through the point (8, 16)?

A  $y = -4x + 48$

B  $y = -4x + 14$

C  $y = \frac{1}{4}x + 3$

D  $y = \frac{1}{4}x + 14$

55. The matrix below displays prices of pizzas at different pizza shops.

|        | Sal's Pizza | Quick Stop Pizza | Romero's Pizza | John's Pizza |
|--------|-------------|------------------|----------------|--------------|
| Small  | \$8.00      | \$6.00           | \$9.50         | \$7.00       |
| Medium | \$10.00     | \$9.00           | \$12.75        | \$10.00      |
| Large  | \$12.00     | \$13.00          | \$14.75        | \$13.00      |

Mrs. Hughes is ordering 6 large pizzas and 2 medium pizzas. Which pizza shop will charge the least for the order?

A Sal's Pizza

B Quick Stop Pizza

C Romero's Pizza

D John's Pizza

56. The matrices below display the number of wins, losses, and ties during two seasons.

|               | <b>First Season</b> |               |             |               | <b>Second Season</b> |               |             |
|---------------|---------------------|---------------|-------------|---------------|----------------------|---------------|-------------|
|               | <b>Wins</b>         | <b>Losses</b> | <b>Ties</b> |               | <b>Wins</b>          | <b>Losses</b> | <b>Ties</b> |
| <b>Team 1</b> | 13                  | 15            | 12          | <b>Team 1</b> | 19                   | 14            | 9           |
| <b>Team 2</b> | 17                  | 12            | 10          | <b>Team 2</b> | 14                   | 19            | 10          |

What is the total number of losses by Team 2 for these two seasons?

- A 27
- B 31
- C 33
- D 60

57. The matrix below shows women’s real hourly wages for the period of years from 1975 to 1995, based on level of education.

|             | <b>High School<br/>Diploma</b> | <b>College<br/>Degree</b> |
|-------------|--------------------------------|---------------------------|
| <b>1975</b> | \$9.27                         | \$13.24                   |
| <b>1980</b> | \$9.33                         | \$12.64                   |
| <b>1985</b> | \$9.31                         | \$13.59                   |
| <b>1990</b> | \$9.24                         | \$14.73                   |
| <b>1995</b> | \$9.21                         | \$15.28                   |

Over the 20-year period, how did the real hourly wages of women with only a high school diploma compare with the real hourly wages of women with a college degree?

- A Both groups showed an overall decrease in hourly wages.
- B Both groups showed an overall increase in hourly wages.
- C The real hourly wages for women with only a high school diploma generally increased, while the real hourly wages for women with a college degree generally decreased.
- D The real hourly wages for women with a college diploma generally increased, while the real hourly wages for women with only a high school diploma generally decreased.

58. The table below shows the costs for visits of different lengths by cleaning companies in a town. The length of a visit is represented by  $x$ , and the cost of a visit is represented by  $y$ . Each cleaning company charges a flat fee for visiting the house or apartment and an hourly rate.

| <b>Length of Visit<br/>(in hours)</b> | <b>Cost of Visit</b> |
|---------------------------------------|----------------------|
| 2                                     | \$72                 |
| 2                                     | \$76                 |
| 3                                     | \$91                 |
| 3.5                                   | \$103                |
| 4                                     | \$105                |
| 4.5                                   | \$113                |
| 5.5                                   | \$135                |

The equation of the line of best fit for the data is  $y = 16.8x + 40.5$ . What does the  $y$ -intercept represent?

- A length of a visit
- B cost of a visit
- C flat fee
- D hourly rate

59. An amusement park charges \$15 to enter the park and an additional fee for each time a guest rides a roller coaster. Susan rode 6 times on a roller coaster. Her total payment was \$33. Maria rode 11 times on a roller coaster. What was her total payment?
- A \$44
  - B \$48
  - C \$50
  - D \$58

60. Which equation describes the function below?

| $x$ | $y$ |
|-----|-----|
| -2  | 6   |
| 5   | 27  |
| 4   | 18  |
| 7   | 51  |

- A  $y = -3x$
- B  $y = 5x + 16$
- C  $y = x^2 + 2$
- D  $y = 2x^2 - 2$

61. Carol has three times as many 10-dollar bills as 5-dollar bills. She has a total of \$350. How many 5-dollar bills does Carol have?
- A 10
  - B 14
  - C 30
  - D 42

62. In 2000 Jim planted a tree that was  $4\frac{1}{2}$  feet tall. In 2005 the tree was  $15\frac{3}{4}$  feet tall. Assuming the growth of the tree is linear, what was the rate of growth of the tree?
- A  $2\frac{1}{4}$  feet per year
  - B  $4\frac{1}{2}$  feet per year
  - C  $5\frac{5}{8}$  feet per year
  - D  $11\frac{1}{4}$  feet per year

63. The number of cell phones,  $y$  (in thousands), from 1985 to 1995 can be modeled using the equation  $y = 0.432(1.55)^x$ , where  $x$  is the number of years after 1985. In what year were there *approximately* 6 thousand cell phones?

- A 1989
- B 1991
- C 1993
- D 1995

64. Given the system of equations:

$$\begin{aligned}4x - 6y &= 12 \\2x + 2y &= 6\end{aligned}$$

What is the value of  $y$ ?

- A 3
- B 1.2
- C 0
- D -1.8



**End of Algebra I Test**

**North Carolina Test of Algebra I  
Form H RELEASED Fall 2009  
Answer Key**

| Item Number | Correct Answer | Goal                              |
|-------------|----------------|-----------------------------------|
| 1           | D              | 1 — Number and Operations         |
| 2           | A              | 1 — Number and Operations         |
| 3           | A              | 1 — Number and Operations         |
| 4           | B              | 1 — Number and Operations         |
| 5           | B              | 2 — Measurement and Geometry      |
| 6           | D              | 3 — Data Analysis and Probability |
| 7           | C              | 3 — Data Analysis and Probability |
| 8           | C              | 3 — Data Analysis and Probability |
| 9           | A              | 3 — Data Analysis and Probability |
| 10          | C              | 3 — Data Analysis and Probability |
| 11          | C              | 4 — Algebra                       |
| 12          | D              | 4 — Algebra                       |
| 13          | A              | 4 — Algebra                       |
| 14          | B              | 4 — Algebra                       |
| 15          | C              | 4 — Algebra                       |
| 16          | B              | 4 — Algebra                       |
| 17          | C              | 1 — Number and Operations         |
| 18          | C              | 1 — Number and Operations         |
| 19          | B              | 1 — Number and Operations         |
| 20          | A              | 2 — Measurement and Geometry      |
| 21          | D              | 2 — Measurement and Geometry      |
| 22          | A              | 3 — Data Analysis and Probability |
| 23          | B              | 3 — Data Analysis and Probability |
| 24          | A              | 3 — Data Analysis and Probability |
| 25          | D              | 3 — Data Analysis and Probability |
| 26          | D              | 3 — Data Analysis and Probability |
| 27          | C              | 4 — Algebra                       |
| 28          | C              | 4 — Algebra                       |
| 29          | B              | 4 — Algebra                       |
| 30          | A              | 4 — Algebra                       |
| 31          | B              | 4 — Algebra                       |
| 32          | B              | 4 — Algebra                       |
| 33          | D              | 1 — Number and Operations         |
| 34          | A              | 1 — Number and Operations         |
| 35          | A              | 1 — Number and Operations         |
| 36          | D              | 1 — Number and Operations         |
| 37          | B              | 2 — Measurement and Geometry      |
| 38          | B              | 2 — Measurement and Geometry      |
| 39          | C              | 3 — Data Analysis and Probability |
| 40          | C              | 3 — Data Analysis and Probability |
| 41          | A              | 3 — Data Analysis and Probability |
| 42          | B              | 3 — Data Analysis and Probability |

**North Carolina Test of Algebra I**  
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**Answer Key**

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|    |   |                                   |
|----|---|-----------------------------------|
| 43 | D | 3 — Data Analysis and Probability |
| 44 | A | 4 — Algebra                       |
| 45 | D | 4 — Algebra                       |
| 46 | C | 4 — Algebra                       |
| 47 | B | 4 — Algebra                       |
| 48 | D | 4 — Algebra                       |
| 49 | B | 1 — Number and Operations         |
| 50 | A | 1 — Number and Operations         |
| 51 | A | 1 — Number and Operations         |
| 52 | D | 1 — Number and Operations         |
| 53 | B | 2 — Measurement and Geometry      |
| 54 | D | 2 — Measurement and Geometry      |
| 55 | A | 3 — Data Analysis and Probability |
| 56 | B | 3 — Data Analysis and Probability |
| 57 | D | 3 — Data Analysis and Probability |
| 58 | C | 3 — Data Analysis and Probability |
| 59 | B | 4 — Algebra                       |
| 60 | C | 4 — Algebra                       |
| 61 | A | 4 — Algebra                       |
| 62 | A | 4 — Algebra                       |
| 63 | B | 4 — Algebra                       |
| 64 | C | 4 — Algebra                       |