

# GRADE 9 MATHEMATICS

**Administered January 2010** 



### 9th Grade TAKS Mathematics Test

1. Olga plans to take a trip from her house in San Marcos, Texas, to a friend's house in Zapata, Texas. She measured the distance between the two places on a map and found it to be 8

inches. If the scale on the map is  $\frac{1}{2}$  inch

represents 14 miles, which is closest to the actual distance in miles between the two places?

- **A.** 44 mi
- **B.** 224 mi
- **C.** 112 mi
- **D.** 56 mi

- 2. To find c, the total cost of an order of DVDs from a certain website, the equation c = 19.99n + 4.99 can be used, where n represents the number of DVDs ordered. If c is a function of n, which of the following best describes this relationship?
  - **F.** The value of n is dependent on c.
  - **G.** The value of c is constant in relation to n.
  - **H.** The value of c is dependent on n.
  - **J.** The value of n is constant in relation to c.
- **3.** Ronald wants to buy a shirt that is on sale for 15% off the regular price. The regular price of the shirt is *p* dollars. Which expression represents the sale price of the shirt?
  - **A.** *p* 0.15*p*
  - **B.** p + 0.15p
  - **C.** 0.15*p*
  - **D.** *p* 15*p*

Date: \_

**4.** Mrs. Shawnee wants to buy fresh cherries to make some cherry pies for the school bake sale. The table below shows the sale prices of fresh cherries at 4 local markets.

Market	Cherries
Rosie's Fruit Stand	6 pints for \$5.40
Fruits and More	1 gallon for \$5.80
Nicky's Fruit Store	2 quarts for \$3.00
Freshly Picked Fruits	11 cups for \$4.50

## **Cherry Prices**

According to the table, which market has the best sale price per cup of cherries?

- **F.** Fruits and More
- G. Rosie's Fruit Stand

- H. Freshly Picked Fruits
- J. Nicky's Fruit Store

**5.** The graph of a function is shown below.



If the graph is translated 7 units down, which of the following best represents the resulting graph?



6. Which inequality best describes the graph shown below?



F. 
$$y > -\frac{4}{3}x + 5$$
  
G.  $y > -\frac{3}{4}x + 5$   
J.  $y < -\frac{4}{3}x + 5$ 

- 7. Which expression represents the area of a rectangle with sides measuring  $2x^2$   $y^4 z$  units and  $5xy^4 z^3$  units?
  - **A.**  $7x^{3}y^{8}z^{4}$  units <sup>2</sup> **B.**  $10x^{2}y^{8}z^{3}$  units <sup>2</sup> **C.**  $10x^{3}y^{8}z^{4}$  units <sup>2</sup>
  - **D.**  $7x^2 y^8 z^3$  units <sup>2</sup>

- 8. If a wheel spins at a rate of 36 revolutions per minute, how many revolutions per hour does the wheel spin?
  - F. 36G. 2160
  - **H.** 216
  - **J.** 360

- **9.** *ALMN* has vertices *L* (*a*, *b*), *M* (*r*, *s*), and *N* (*u*, *v*). What will be the new coordinates of point *M* if the triangle is translated 7 units to the right and 3 units down?
  - A. (r + 3, s 7)B. (r - 3, s + 7)C. (r + 7, s - 3)
  - **D.** (r 7, s + 3)
- 10. Mr. Ross is purchasing a table and chairs for \$1350, including tax and interest. He will pay for the furniture with monthly payments of \$75. If Mr. Ross has made m payments, which equation best describes r, the amount of the remaining balance?
  - F. r = 75m 1350G. r = 75m + 1350H. r = 1350 - 75m
  - **J.** r = (1350 75)m

11. Look at the drawing shown below.



If  $\triangle KMP$  is a right triangle formed by the placement of 3 squares, what is the area of the shaded square?

- **A.** 81 in.<sup>2</sup>
- **B.** 66 in.<sup>2</sup>
- **C.**  $24 \text{ in.}^{2}$
- **D.** 135 in.<sup>2</sup>
- 12. Brandon has a budget of \$58 to spend on clothes. The shirts he wants to buy are on sale for \$9 each, and the pair of pants he wants costs \$21. All prices include tax. Which inequality could be used to determine *s*, the maximum number of shirts Brandon can buy if he also buys the pair of pants?
  - **F.**  $9s + 21 \le 58$ **G.** 21s + 9 < 58
  - **H.** 30*s* < 58
  - **J.** 9*s* 21 ≤58

**13.**  $\triangle MNQ$  is similar to  $\triangle MLP$ .



- If ML = 10 centimeters, what is the length of MN?
- A. 6.25 cm
- **B.** 4 cm
- **C.** 8.3 cm
- **D.** 7.5 cm

14. A florist plans to sell bouquets for \$25 each. He wants to use only roses and carnations in each bouquet and needs to charge the following amount for each type of flower.

> \$1.50 per rose \$1.25 per carnation

Which of these combinations of roses and carnations will result in bouquets that the florist can sell for exactly \$25 each?

- I. 18 roses and 2 carnations
- II. 6 roses and 10 carnations
- III. 10 roses and 8 carnations
- IV. 5 roses and 14 carnations
- **F.** III and IV only
- G. II and III only
- H. I and II only
- J. I and IV only
- 15. Harris has \$20.92 to spend on video-game rentals at a local video store. The store charges \$3.95 per video-game rental plus an 8.125% tax. What is the maximum number of video games that Harris can rent?
  - **A.** 5 **B.** 4
  - **D.** 4 **C.** 6
  - **D**. 3
  - **D.** 3
- **16.** The drawing below shows both the top view of a solid structure built with identical cubes as well as the number of cubes in each column of the structure.

3	3
2	3
1	1
2	1
	3 2 1 2

Front

Which 3-dimensional view best represents the same structure?





17. A jar contains 6 red marbles and 10 blue marbles, all of equal size. If Dominic were to randomly select 1 marble without replacement and then select another marble from the jar, what would be the probability of selecting 2 red marbles from the jar?

**A.**  $\frac{1}{8}$  **B.**  $\frac{3}{8}$  **C.**  $\frac{3}{5}$ **D.**  $\frac{9}{64}$ 

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- **18.** If (x, -3.2) is a solution to the equation 4x = 5y 17, what is the value of *x*?
  - **F.** -5.96
  - **G.** -8.25
  - **H.** 0.25
  - **J.** 0.84
- **19.** The horizontal distance and the vertical distance between the pegs on the geoboard shown below each represent 1 unit.



Which is closest to the area of the polygon modeled on the geoboard?

- A.  $17 \text{ units }^2$
- **B.**  $27 \text{ units }^2$
- C. 21 units  $^2$
- **D.**  $34 \text{ units }^2$

- 20. Heidi has a main-course choice of a hamburger, a hot dog, an egg roll, a taco, a fish sandwich, or a chicken sandwich. She has a side-order choice of french fries, corn chips, potato chips, or a salad. Heidi's beverage choice can be a soda, fruit punch, milk, or water. Which is the best method to determine how many different combinations Heidi could choose?
  - **F.** Multiply the total number of items in each of the 3 categories together
  - **G.** Add the total number of items in the 3 categories together
  - **H.** Multiply the total number of main-course choices by the total number of side-order choices and add the product to the total number of beverage choices
  - J. Multiply the sum of the total number of main-course choices and the total number of side-order choices by the total number of beverage choices
- **21.** What is the simplified form of  $\frac{a^4b^2c}{a^3b^5c^2}$ ?

A. 
$$ab^{3}c^{2}$$
  
B.  $a^{7}b^{7}c^{3}$   
C.  $\frac{a}{b^{3}c^{3}}$   
D.  $\frac{a}{b^{3}c}$ 

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**22.** What is the slope of the line that contains the coordinate points (8, -3) and (-2, 7)?



# **F.** $-\frac{9}{11}$

**G.** –1

**H.** 
$$-\frac{2}{5}$$

- **J.**  $-\frac{5}{3}$
- 23. The table below shows the number of student absences for the school year in Mr. Cruz's math classes.

### Student Absences

Days Absent	Number of Students		
0	73		
1	55		
2	6		
3	3		
More than 3	6		

Which of the following graphs best represents the data shown in the table?



24. Tammy drew a floor plan for her kitchen, as shown below.



Which expression represents the area of Tammy's kitchen floor in square units?

- F.  $6x^2 + 30x + 5$ H. 5x + 6G. 10x + 12J.  $6x^2 + 13x + 5$
- **25.** Points *K* and *L* are shown on the grid below.



If point K is the midpoint of JL, what are the coordinates of endpoint J?

 A. (6, -5)
 C. (-6, 7)

 B. (0, 1)
 D. (-4, 5)

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**26.** The graph of a linear function is shown on the coordinate grid below.



If the *y*-intercept is changed to (0, 5) and the slope becomes -4, which statement best describes the relationship between the two lines when they are graphed on the same coordinate grid?

- **F.** The *y*-intercepts are 1 unit apart, and the lines intersect at (1, 1).
- **G.** The *y*-intercepts are 1 unit apart, and the lines intersect at (1, 0).
- H. The *y*-intercepts are 1 unit apart, and the lines are perpendicular.
- **J.** The *y*-intercepts are 1 unit apart, and the lines are parallel.
- 27. If a < b and b = c, which statement must be true?</p>
  - A. The value of a is greater than the value of c.
  - **B.** The values of *a*, *b*, and *c* are negative.
  - C. The value of a is less than the value of c.
  - **D.** The values of *a*, *b*, and *c* are positive.

- 28. The integers 1881, 353, 2002, and 787 are palindrome integers. Which of the following is also a palindrome integer?
  F. 783
  - **G.** 2525
  - H. 828
  - **J.** 1961

- **29.** Which of the following ordered pairs is the *x*-intercept or the *y*-intercept of the function 2x y = 8?
  - **A.** (8, 0)
  - **B.** (0, 8)
  - **C.** (0, 4)
  - **D.** (4, 0)
- **30.** Which graph below best represents the linear parent function?





**31.** The graph below represents Lynne's car trip from her house to the mall and then back to her house.



If each section of the graph represents part of Lynne's trip, which part of the trip took the least amount of time?

 A. s
 C. r

 B. p
 D. q

**32.** Mr. Carpenter built a wooden gate, as shown below.



Which is closest to the length in feet of the diagonal board that Mr. Carpenter used to brace the wooden gate?

- **F.** 4.9 ft
- **G.** 6.9 ft
- **H.** 6.1 ft
- **J.** 5.3 ft

**33.** The drawing below shows a solid with hexagonal bases.



Which drawing best represents the top view of this hexagonal solid?



**34.** The student council members are making decorative labels to cover 20 identical empty coffee cans for a charity drive. Each label will cover the entire lateral surface area of a can.



Which is closest to the lateral surface area of a single coffee can?

- **F.** 157 in.  $^{2}$
- **G.**  $128 \text{ in.}^{2}$
- **H.** 195 in.<sup>2</sup>
- **J.** 186 in.  $^{2}$

**35.** Look at the graph below.



Which is the best interpretation of this graph?

- A. Jorge earns \$20 for each hour worked.
- **B.** For every 10 pieces of candy Stacey buys, she pays \$1.
- C. For every 10 students at a dance, 2 teachers are needed as chaperones.
- **D.** A runner runs at a constant rate of 2 miles every 30 minutes.

**36.**  $\triangle AHP \sim \triangle ENK$  as shown below.





Which scale factor was used to transform  $\triangle AHP$  to  $\triangle ENK$ ?

- F.  $\frac{1}{4}$  H.  $\frac{10}{17}$  

   G.  $\frac{11}{20}$  J.  $\frac{3}{7}$
- 37. Narong's family bought 3 shirts, 2 pairs of jeans, and 2 pairs of shoes. Each shirt cost \$18, and each pair of shoes cost \$35. The jeans were marked down from their original price of \$40. What other information, if any, is needed to find the total cost of the 7 items before tax?
  - A. The percent markdown for the jeans
  - **B.** The percent markdown for the shirts
  - **C.** The original price of the jeans
  - **D.** No additional information is needed.

- **38.** Ms. Díaz asked each of her 27 statistics students to write down an integer from 1 to 10. To determine the most common number the students picked, which measure of central tendency should Ms. Díaz use?
  - F. Range
  - G. Median
  - H. Mode
  - J. Mean

- **39.** The astronomy club rented a bus to visit the planetarium. The club rented the bus at a rate of \$24.95 per day plus \$0.45 per mile driven over 50 miles. If the astronomy club rented the bus for 1 day, what additional information is needed to determine the total cost of renting the bus?
  - **A.** The total number of students in the astronomy club
  - **B.** The number of days the bus was rented
  - C. The total number of miles the bus was driven
  - **D.** The number of hours the bus was driven each day
- **40.** Mrs. Lee bought a small rectangular box that contains 10 tightly packaged erasers shaped like rectangular prisms, as shown below.



What is the approximate volume in cubic centimeters of this rectangular box?

F.	$513$ cm $^3$	Н.	$97~\mathrm{cm}^{3}$
G.	$192$ cm $^3$	J.	$19$ cm $^3$

**41.** A small business purchased a van to handle its delivery orders. The graph below shows the value of this van over a period of time.



Which of the following best describes this situation?

- A. The van has no value after 5 years.
- **B.** The van decreases in value by \$1,600 per year.
- C. The van was purchased for \$1,600.
- **D.** The van increases in value by \$1,600 per year.

**42.** Mr. Rivera wants to build a barbed-wire fence containing 5 rows of barbed wire around the irregularly shaped area shown in the drawing below.



Mr. Rivera wants to purchase rolls of barbed wire that contain 1380 linear feet of wire per roll and purchase an extra 500 linear feet of wire for a gate for the fence. Which of the following is a correct method for Mr. Rivera to calculate the total number of rolls of barbed wire he will need to purchase?

- **F.** Determine the area of the property, multiply by 5, add 500, and then divide by 1380
- **G.** Determine the perimeter of the property, multiply by 5, and then divide by the sum of 1380 and 500
- **H.** Determine the area of the property, multiply by 5, and then divide by the sum of 1380 and 500
- **J.** Determine the perimeter of the property, multiply by 5, add 500, and then divide by 1380

**43.** In many parades, flowers are used to decorate the floats. The table below shows the number of flowers used in each row of a parade float.

Row Number, <i>r</i>	Number of Flowers, n	
1	54	
2	58	
3	62	
4	66	

Which equation best describes these data?

A. n = 4r + 54B. n = 2r + 52C. n = 4r + 50D. n = r + 54 44. The graph below shows the relationship between the distance in miles a delivery truck traveled and the number of hours each delivery took.



Which best describes the relationship shown on the graph?

- **F.** Constant trend
- G. Negative trend
- **H.** Positive trend
- J. No trend

**45.** The net of a cube is shown below. Use the ruler on the Mathematics Chart to measure the dimensions of the cube to the nearest tenth of a centimeter.



Which is closest to the total surface area of the cube represented by this net?

- A.  $12 \text{ cm}^2$ C.  $74 \text{ cm}^2$ B.  $11 \text{ cm}^2$ D.  $43 \text{ cm}^2$
- **46.** If the dimensions of a rectangle are doubled, which of the following best describes an effect on the rectangle?
  - F. The new area will be 8 times as large as the original area.
  - G. The new area will be 2 times as large as the original area.
  - H. The new perimeter will be 2 times as large as the original perimeter.
  - J. The new perimeter will be 4 times as large as the original perimeter.

**47.** When Memorial Elementary held its annual spring festival, Benjamin surveyed 100 students to see which activity they preferred. The graph below shows the results of Benjamin's survey.



**Favorite Activities** 

Which of the following statements is supported by these data?

- **A.** The ratio of students who preferred musical chairs to the pie toss was 1:3.
- **B.** Close to half the students surveyed preferred either the moon walk or the dunking booth.
- **C.** More than 25% of the students surveyed preferred the pony ride or the pie toss.
- **D.** More students preferred musical chairs than preferred all the other activities combined.

**48.** The table below shows various values for *x* and *y*.

x	у
-6	23
-2	11
7	-16
11	-28

Which equation best describes the relationship between *x* and *y*?

F. 
$$y = 3x + 41$$
H.  $y = -5x - 7$ G.  $y = -x + 17$ J.  $y = -3x + 5$ 

**49.** Which point on the grid below best represents the coordinates  $\left(\frac{8}{3}, \frac{7}{3}\right)$ ?



A. Point K

C. Point R

B. Point U

**D.** Point M

- **50.** The perimeter of a rectangular wooden deck is 90 feet. The deck's length, *l*, is 5 feet less than 4 times its width, *w*. Which system of linear equations can be used to determine the dimensions, in feet, of the wooden deck?
  - F. 2l + 2w = 90 l = 5w - 4G. 2l + 2w = 90 l = 4w - 5H. 2l + 2w = 90 l = 4 - 5wJ. 2l + 2w = 90l = 5 - 4w
- **51.** Line *t* intersects parallel lines  $l_1$  and  $l_2$ , as shown below.



According to the information provided, which of the following pairs of angles are not always congruent?

- A. Alternate interior angles 3 and 5 C. Corresponding angles 2 and 6
- **B.** Same-side interior angles 4 and **D.** Vertical angles 5 and 7 5

**52.** The graph of the function  $y = x^2 - 3$  is shown below.



If the graph of the original function is shifted 5 units up, which of the following equations best represents the translation of each point on the curve?

F.	$y = x^2 - 2$	H.	$y = x^2 + 2$
G.	$y = x^2 - 8$	J.	$y = x^2 + 5$