

Student Name \_\_\_\_\_

# OHIO GRADUATION TESTS



## **Mathematics**

### **Practice Test**

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September 2004

(Printed August 2004)



**MATHEMATICS TEST**

**Directions:** For multiple-choice items, choose the best answer then blacken the corresponding space on your Answer Document. If you change an answer, be sure to erase the first mark completely. When you respond to the short-answer and extended-response items, you do not have to use the entire area of the space provided. The use of the grid paper in your Answer Document is optional unless otherwise stated. Be sure that your answers are complete and all your work appears in the Answer Document.

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1. The table below contains the results of a biology experiment.

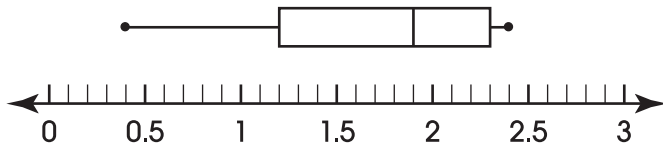
**Record of Blooms**

<b>Week</b>	1	2	3	4	5
<b>Number of Blooms</b>	3	9	27	81	$b$

Assuming the pattern shown in the table continues, what is the value of  $b$ ?

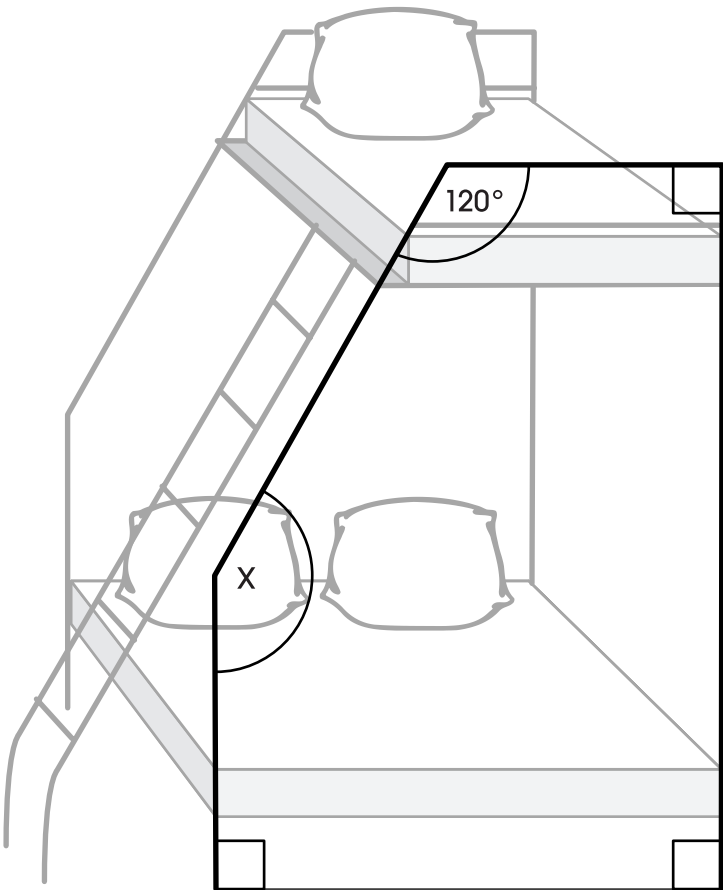
- A. 108
- B. 130
- C. 162
- D. 243

2. The box-and-whisker plot below describes the weights of a sample of 100 chickens.

**Distribution of Weights of Chickens (lb)**

- What statement can be made about the data, using the graph alone?
- A. The range of the weights is 3 lb.
  - B. The median weight is less than 2 lb.
  - C. Twenty-five percent of the chickens weigh less than 1 lb.
  - D. Fifty percent of the chickens weigh more than 2 lb.
3. Which equation is equivalent to  $3(2x - 5) = 4(x + 3)$ ?
- A.  $2x = -27$
  - B.  $2x = 27$
  - C.  $10x = -27$
  - D.  $10x = -3$

4. Darius and his father are constructing a set of bunk beds as shown in the diagram below.



What is the measure of angle X?

- A.  $540^\circ$
- B.  $390^\circ$
- C.  $150^\circ$
- D.  $120^\circ$

5. Three different opinion polls show different results for the proportion of voters expected to vote for Candidate A in an election for mayor.

**Poll 1:** Nine of every 20 voters are expected to vote for Candidate A.

**Poll 2:** The percentage of voters expected to vote for Candidate A is 52%.

**Poll 3:** There are 130,000 people expected to vote, and of these, 55,000 are expected to vote for Candidate A.

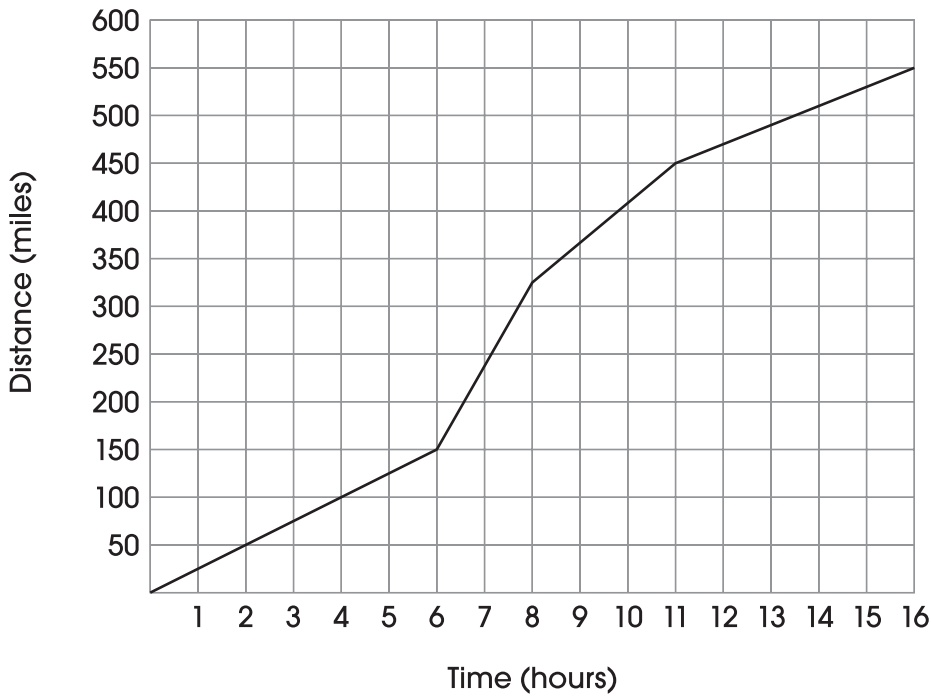
In your **Answer Document**, determine which of these polls shows the greatest favorable result for Candidate A. Show your work or provide an explanation for your answer.

For question 5, respond completely in your **Answer Document**. (2 points)

6. A set of data contains 10 negative numbers and 4 positive numbers. Which one of these statements must be true?
- A. The mean is a negative number.
  - B. The median is a negative number.
  - C. The mode is a negative number.
  - D. The range is a negative number.

7. Travis went on a long trip. The graph below represents the relationship between distance and time.

**Rate of Travel**



During what interval was Travis' average rate of travel the fastest?

- A. 0 to 6
- B. 6 to 8
- C. 8 to 11
- D. 11 to 16

8. Which expression represents 270,000 written in scientific notation?

- A.  $270 \times 10^3$
- B.  $27 \times 10^4$
- C.  $2.7 \times 10^5$
- D.  $0.27 \times 10^6$

9. The table below shows values for  $x$  and  $y$ .

$x$	$y$
0	-1
1	0
2	3
3	8
4	15
5	24

Which of these equations represents the relationship between  $x$  and  $y$ ?

- A.  $y = x - 1$
- B.  $y = x + 19$
- C.  $y = x^2 - 1$
- D.  $y = 2x^2 - 5$

10. Triangle DEF has vertices with coordinates D(-2, 1), E(1, 5) and F(2, 3).

In your **Answer Document**, draw and label triangle DEF on the grid provided.

Draw the triangle D'E'F' by translating each vertex of triangle DEF three units to the right and two units down. Appropriately label triangle D'E'F'.

Draw the triangle D''E''F'' by translating each vertex of triangle D'E'F' two units to the left and seven units up. Appropriately label triangle D''E''F''.

Describe the movements necessary to perform a single translation of each vertex from triangle DEF to triangle D''E''F''.

For question 10, respond completely in your **Answer Document**. (4 points)

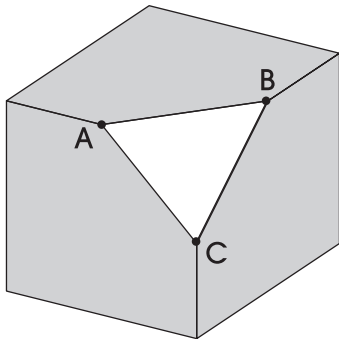
11. Which number is irrational?

- A. -2
- B.  $\sqrt{8}$
- C. 3
- D.  $\frac{22}{8}$

12. Julie does not want to spend more than \$300 on ice skating. Her skates will cost \$42, her lessons will cost a total of \$56, and the practice time will cost \$7.50 per hour.

Which inequality should Julie use to determine the maximum number of hours,  $h$ , she can practice without spending more than \$300?

- A.  $56 + 7.50h < 300$   
B.  $42 + 7.50h < 300$   
C.  $7.50h - 42 - 56 \leq 300$   
D.  $42 + 56 + 7.50h \leq 300$
13. Daniel cut the corner off a cube as shown in the diagram below.



Points A, B and C are the midpoints of the edges of the cube. What type of three-dimensional figure has been cut off?

- A. cone  
B. cube  
C. triangular prism  
D. triangular pyramid

14. Pippi calculates her total earnings for the month with the equation

$$E = 15m + 5b,$$

where  $E$  is the total number of dollars she earns,  $m$  is the number of lawns she mows, and  $b$  is the number of hours she baby-sits.

If Pippi mows 6 lawns, how many hours must she baby-sit to earn a total of \$200?

- A. 20  
B. 22  
C. 40  
D. 45
15. The population density of a state, in people per square mile, is found by dividing the population of the state by its area in square miles. Florida has an area of 53,936 square miles. In 1998, Florida had a population of 14,915,980 and a population density of 276.5 people per square mile.

In your **Answer Document**, describe the conditions under which a different state could have a smaller population than Florida but have a greater population density.

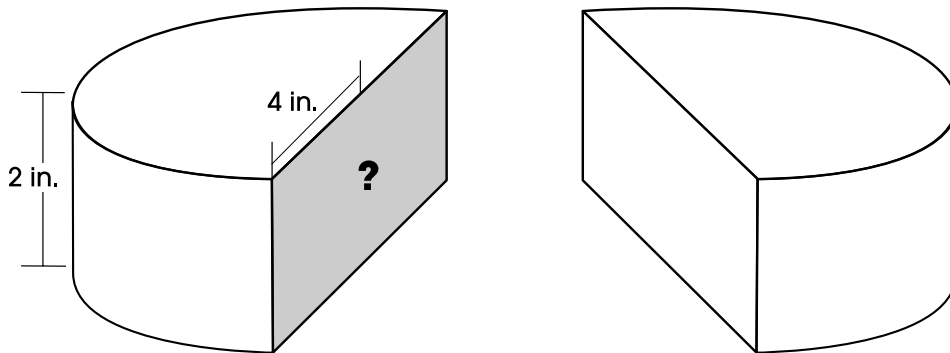
For question 15, respond completely in your **Answer Document**. (2 points)

## Mathematics

16. George wants to conduct a survey to determine the types of music that the students want at a school dance.

Which sample population should George survey to represent the entire student body?

- A. survey the teachers
  - B. survey the captain from each sports team
  - C. randomly survey two people from each homeroom class
  - D. randomly survey 50 people from the freshman class
17. Gene has a cylinder with radius 4 inches and height 2 inches. He cut the cylinder in half along the length of the diameter, as shown in the diagram below.



What is the area of the shaded cross-section?

- A.  $48\pi$  square inches
- B.  $24\pi$  square inches
- C. 16 square inches
- D. 8 square inches

18. A system of equations is shown below.

$$\begin{aligned}3x + 2y &= 19 \\2x - y &= 1\end{aligned}$$

What is the solution to the system of equations?

- A.  $x = 1, y = 1$   
B.  $x = 3, y = 5$   
C.  $x = 7, y = -1$   
D.  $x = 19, y = 1$
19. Carlos and Tiesha empty a bag of 100 colored candies and count the number of each color, as shown in the following chart.

**Number of Candies of Each Color**

Color	Number
Orange	20
Red	10
Brown	30
Green	10
Yellow	15
Blue	15

They return all the candies to the bag and shake the bag. Carlos removes 5 candies, 2 of which are blue. Tiesha then pulls out one candy.

What is the probability that Tiesha pulls out a blue candy?

- A. 6.67%  
B. 13.68%  
C. 15.00%  
D. 15.79%





**M**