Student Name: _____

Ohio Achievement Tests

Mathematics Student Test Booklet

March 2006

This test was originally administered to students in March 2006.

Not all items from the March 2006 administration will be released in this document. According to Ohio Revised Code (ORC) 3301.07.11: 4(b) . . . not less than forty percent of the questions on the test that are used to compute a student's score shall be a public record. The department (of education) shall determine which questions will be needed for reuse on a future test and those questions shall not be public records and shall be redacted from the test prior to its release as a public record.

This publicly released material is appropriate for use by Ohio teachers in instructional settings. This test is aligned with Ohio's Academic Content Standards for Mathematics.

Directions:

Today you will be taking the Ohio Grade 8 Mathematics Achievement Test. Three different types of questions appear on this test: multiple choice, short answer and extended response.

There are several important things to remember:

1. Read each question carefully. Think about what is being asked. Look carefully at graphs or diagrams because they will help you understand the question.

2. You may use the blank areas of your Student Test Booklet to solve problems. You may also use the optional grid paper in the answer document to solve problems.

3. For short-answer and extended-response questions, use a pencil to write your answers neatly and clearly in the gridded space provided in the answer document. Any answers you write in the Student Test Booklet will not be scored.

4. Short-answer questions are worth two points. Extended-response questions are worth four points. Point values are printed near each question in your Student Test Booklet. The amount of gridded space provided for your answer is the same for all two- and four-point questions.

5. For multiple-choice questions, shade in the circle next to your choice in the answer document for the test question. Mark only one choice for each question. Darken completely the circles on the answer document. If you change an answer, make sure that you erase your old answer completely.

6. Do not spend too much time on one question. Go on to the next question and return to the question skipped after answering the remaining questions.

7. Check over your work when you are finished.

1. Simplify: $5^2 \bullet 5^{-2}$

A. 0

B. 1

C. 5

D. 25

Item 2 has not been slated for public release in 2006.

3. Which equation represents a nonlinear function?

A. $y = x$

B. $y = 2x$

C. $y = x^2$

D. $y = x + 2$

Item 4 has not been slated for public release in 2006.

5. Which statement is correct?

A. All integers are rational numbers.

B. All irrational numbers are whole numbers.

C. A real number must be a rational number.

D. A repeating decimal is an irrational number.

Item 6 has not been slated for public release in 2006.

7. Jill is solving the equation $7n - 6 = 15$. The result of her first step is $7n = 21$.

   What operation did Jill use in her first step?

   A. add 6 to each side
   B. subtract 6 from each side
   C. multiply both sides by 6
   D. divide both sides by 6

Items 8-9 have not been slated for public release in 2006.

On the March 2006 Grade 8 Mathematics Achievement Test, items 10-15 are field-test items, which are not released.

16. There are 1000 students in grades 6, 7 and 8 at the Oak Lake Middle School. To determine which after-school activities are preferred by the students at the school, the student council decided to survey 20 eighth graders in a first period French class.

    In your **Answer Document**, explain whether or not this is an appropriate sampling technique.

For question 16, respond completely in your **Answer Document**. (2 points)

Item 17 has not been slated for public release in 2006.

18. While driving in France, Eric sees a sign that says "Paris 61 Kilometers."

    About how many miles is Eric from Paris?

    A. 35 miles

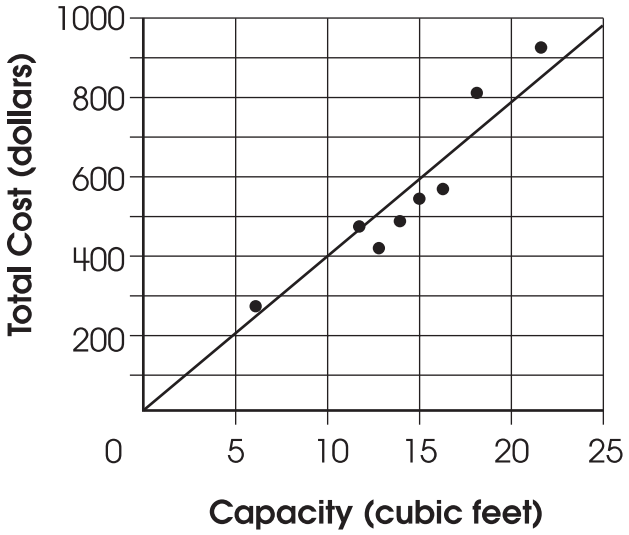
    B. 65 miles

    C. 100 miles

    D. 125 miles

19. The scatter plot and a line of best fit show the relationship between the capacity and the cost of eight refrigerators available at a local appliance store.

Cost and Capacity of the Refrigerators



Which statement describes the relationship between the cost and the capacity of the refrigerators?

A. Refrigerators cost about $700.

B. Refrigerators cost about $40 per cubic foot.

C. Refrigerators cost less as their capacity increases.

D. Refrigerators that cost more than $800 have the smallest capacity.

Items 20-24 have not been slated for public release in 2006.

25. What is the slope of the line containing the points (–2, 5) and (1, –7)?

A. – 4

B. – 2

C. 2

D. 4

26. A store is having a clearance sale on pianos that regularly sell for $3,900 each. Beginning on July 5th, the price of these pianos will be reduced by 20%. Each morning after July 5th, the remaining pianos will be reduced by an additional 20%. This price reduction will continue until all the pianos are sold.

Mr. Thomas can only spend $2,200 for a piano.

In your **Answer Document**, determine the first day that Mr. Thomas can buy one of the pianos with the money he has and determine the price he paid for the piano. Show your work or explain how you determined your answer.

For question 26, respond completely in your **Answer Document**. (2 points)

Items 27-29 have not been slated for public release in 2006.

30. The temperature of a community pool was measured each morning. The daily readings were 82°F, 79°F, 80°F, and 78°F. The temperature on the fifth day was 99°F.

Which statistic was affected the most by the 5th day's temperature?

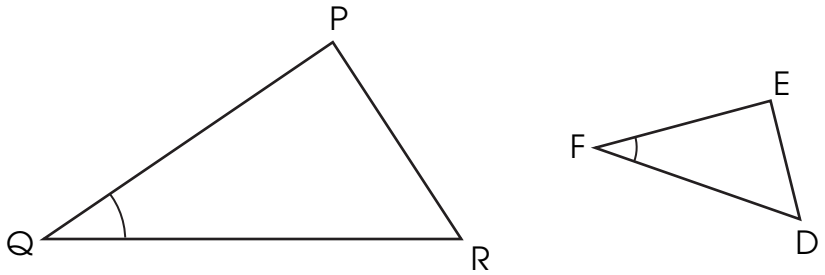
A. the lower quartile

B. the mean of the temperatures

C. the mode of the temperatures

D. the median of the temperatures

31. In the figures, m∠PQR = m∠EFD.

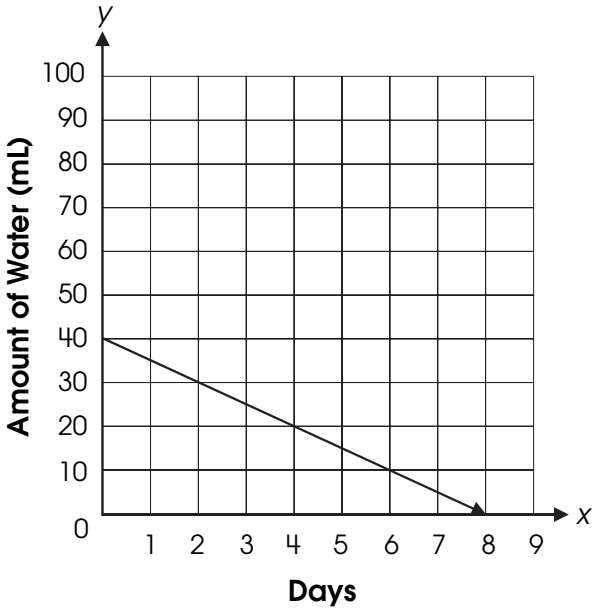


In your **Answer Document**, identify what else must be true about the sides or the angles of the triangle in order for ΔPQR and ΔEFD to be similar triangles. Provide specific examples for these two triangles.

For question 31, respond completely in your **Answer Document**. (2 points)

32. The graph shows the change in the amount of water in an uncovered beaker over several days.

Water in the Beaker



What information does the *y*-intercept provide?

A. The amount of water in the beaker decreased by 40 mL.

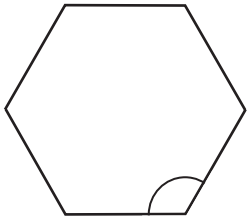
B. The water was gone by the eighth day.

C. The change in the amount of water over time has a negative slope.

D. The water level started at 40 mL.

Item 33 has not been slated for
public release in 2006.

34. The figure shown is a regular hexagon.



What is the measure of each interior angle?

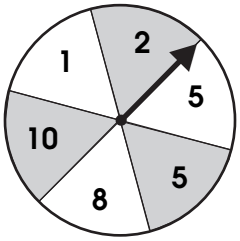
A. 60°

B. 100°

C. 120°

D. 150°

35. The 2 on the spinner shown will be replaced with a 7.



How does the probability of the spinner landing on an even number change?

A. It increases by $\frac{1}{6}$.

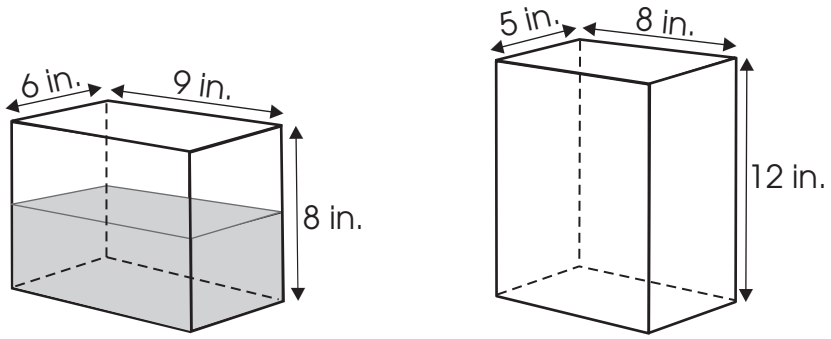
B. It decreases by $\frac{1}{6}$.

C. It increases by $\frac{1}{3}$.

D. It decreases by $\frac{1}{3}$.

Item 36 has not been slated for public release in 2006.

37. The first tank shown is half filled with water. The water from this tank is poured into the second tank, which is empty.



What height will the water reach in the second tank?

A. 4 inches

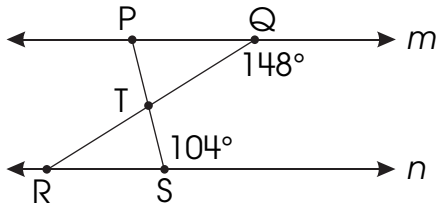
B. 5.4 inches

C. 6 inches

D. 10.8 inches

Item 38 has not been slated for public release in 2006.

39. In the diagram below, line *m* is parallel to line *n*.



What is the measure of ∠PTR?

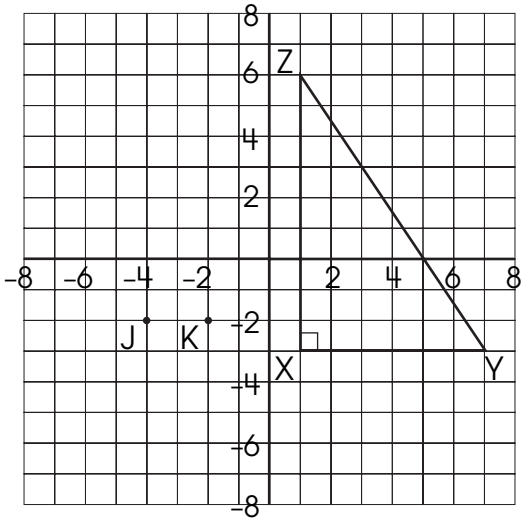
A. 72°

B. 76°

C. 108°

D. 118°

40. Right triangle XYZ and points J and K are shown below.



Triangle XYZ is similar to triangle JKL. What could be the location of point L so that triangle JKL is similar to triangle XYZ?

A. (–4, 4)

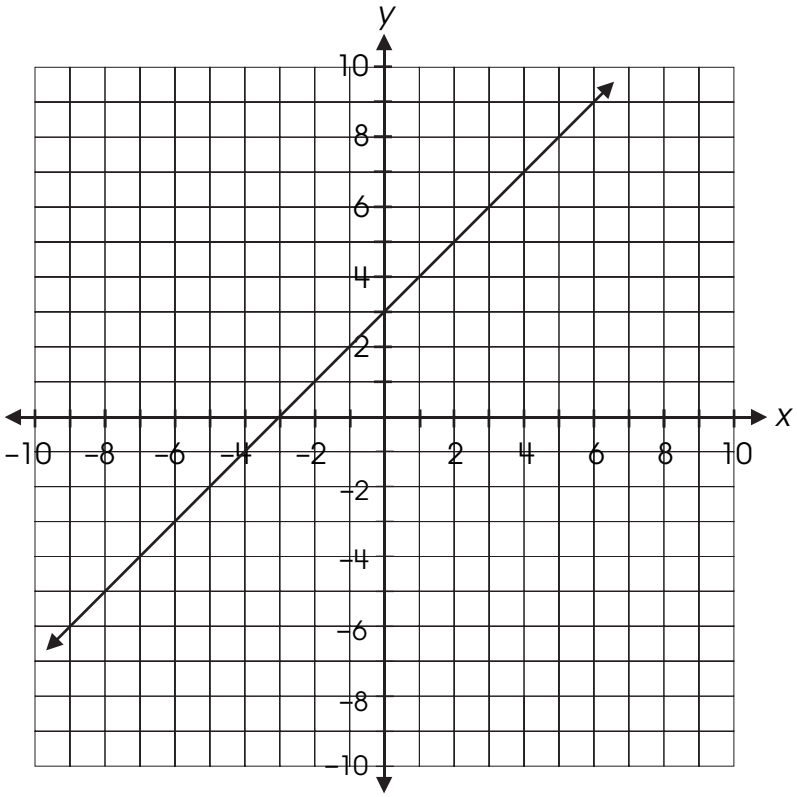
B. (–4, 1)

C. (–2, 2)

D. (–2, 0)

Item 41 has not been slated for public release in 2006.

42. The graph represents the equation $y = x + 3$.



How would the graph change if the constant were changed from 3 to 5?

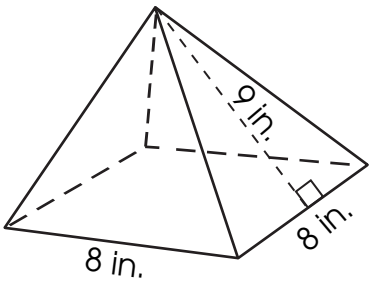
A. The line will shift up 2 units.

B. The line will shift down 2 units.

C. The line will be steeper.

D. The line will change direction.

43. A square pyramid has the dimensions shown.



What is the total surface area of the pyramid?

A. 192 square inches

B. 208 square inches

C. 352 square inches

D. 576 square inches

Item 44 has not been slated for public release in 2006.

STOP