

Student Name: _____

Ohio Achievement Assessments



Mathematics Student Test Booklet Spring 2010

This test was originally administered to students in Spring 2010.

Not all items from the Spring 2010 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 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.

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Ohio Grade 8 Mathematics Achievement Assessment Reference Sheet

Information that may be needed to solve problems on the Mathematics Test:

Area Formulas

parallelogram $A = bh$

rectangle $A = lw$

trapezoid $A = \frac{1}{2} h (b_1 + b_2)$

triangle $A = \frac{1}{2} bh$

Circle Formulas

$C = 2\pi r$
 $A = \pi r^2$

$\pi \approx 3.14$ or $\frac{22}{7}$

Distance Formula

$$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

Volume Formulas

cone $V = \frac{1}{3} \pi r^2 h$

cylinder $V = \pi r^2 h$

pyramid $V = \frac{1}{3} Bh$
(B = area of base)

rectangular prism $V = lwh$

right prism $V = Bh$
(B = area of base)

sphere $V = \frac{4}{3} \pi r^3$

Directions:

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

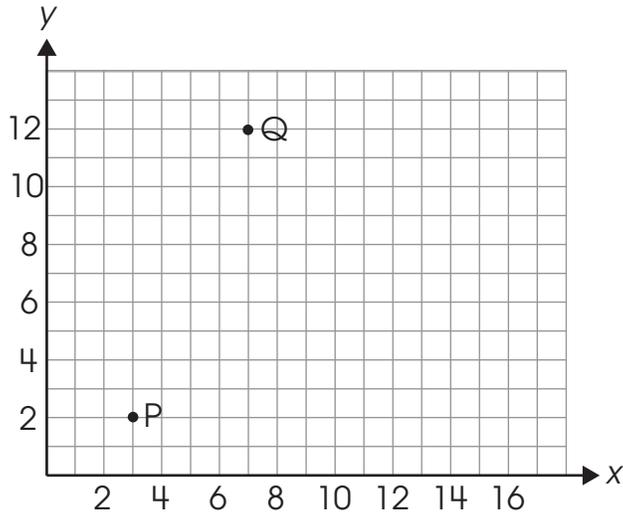
There are several important things to remember:

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. Then, choose or write the answer you think is best.
2. Use only a #2 pencil to answer questions on this test. You may use a calculator on this test.
3. Refer to the Mathematics Reference Sheet in your Student Test Booklet for mathematical formulas and expressions. You may remove this page from your Student Test Booklet.
4. For multiple-choice questions, fill in the circle next to your answer choice. Mark only one answer for each question. If you change your answer, make sure you erase your old answer completely. Do not cross out or make any marks on the other choices.
5. For constructed-response questions, write your answer neatly, clearly and only in the space provided in your Answer Document. Any responses written in your Student Test Booklet will not be scored.
6. 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 space provided for your answers is the same for all two- and four-point questions.
7. You may use the blank areas of your Student Test Booklet or the optional grid paper in your Answer Document to work out and solve problems. Do not tear out the optional grid paper from your Answer Document.
8. If you do not know the answer to a question, skip it and go on to the next question. If you have time, go back to the questions you skipped and try to answer them before turning in your Student Test Booklet and Answer Document.
9. Check over your work when you are finished.
10. When you finish this section of the test, you may **NOT** go back to the reading section or go on to the science section in the Student Test Booklet.

Item 1 has not been slated for public release in 2010.



2. Points P and Q are located on the grid as shown.



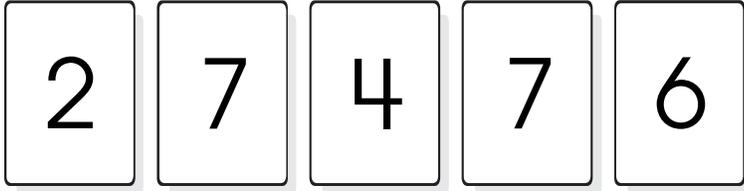
What is the slope of the line that goes through points P and Q?

- A. $-\frac{5}{2}$
- B. $-\frac{2}{5}$
- C. $\frac{2}{5}$
- D. $\frac{5}{2}$

M

Mathematics

3. The five numbered cards are mixed up and placed face down. One card is selected at random.



What is the probability that the card will be a four or a seven?

- A. $\frac{3}{5}$
B. $\frac{2}{5}$
C. $\frac{3}{25}$
D. $\frac{2}{25}$

Item 4 has not been slated for public release in 2010.

M

Mathematics

5. Amy designed a glass pyramid for a museum courtyard. Each side of the square base is 10 feet long. Each of the 4 triangular faces has a height of 10 feet.

How much glass will be used to construct the base and the triangular faces?

- A. 200 square feet
 - B. 300 square feet
 - C. 400 square feet
 - D. 500 square feet
6. In your **Answer Document**, show the steps needed to solve the inequality $-3x + 7 < 28$ and graph the solution on a number line.

For question 6, respond completely in your **Answer Document**. (2 points)

Items 7–9 have not been slated for public release
in 2010.

10. Which equation represents a linear function?

A. $y = 5x^2$

B. $y = \frac{3}{x} + 6$

C. $y = 2x + 4$

D. $y = x^3$



11. The number of points a football team scored in its first eight games are shown.

| | | | | | | | |
|----|----|---|----|----|----|----|----|
| 13 | 24 | 9 | 12 | 17 | 12 | 10 | 21 |
|----|----|---|----|----|----|----|----|

The team scored 48 points in the ninth game.

In your **Answer Document**, determine which measure of center (the mean, the median or the mode) will change the most after the team's ninth game is added to the list. Show your work or explain your reasoning for selecting that measure of center.

For question 11, respond completely in your **Answer Document**. (2 points)

Items 12–13 have not been slated for public release
in 2010.

14. A scientist measured some bacterial cells.
The average diameter of the cells was
0.0000032 millimeters.

What is this measurement written in
scientific notation?

- A. 3.2×10^{-7} millimeters
- B. 3.2×10^{-6} millimeters
- C. 3.2×10^6 millimeters
- D. 3.2×10^7 millimeters

Items 15–16 have not been slated for public release
in 2010.



M

Mathematics

17. A middle school wants to assign 3-letter identification codes to all of its students.

There are 26 letters in the alphabet.

- Letters can be used more than once.
- Letters Q, X and Z will not be used.
- Identification codes will not start with the letters I or O.

How many different identification codes are possible?

- A. 9,261
- B. 11,109
- C. 12,167
- D. 17,576

Items 18–21 have not been slated for public release in 2010.



On the Spring 2010 Grade 8 Mathematics Achievement Assessment, items 22–27 are field-test items, which are not released.

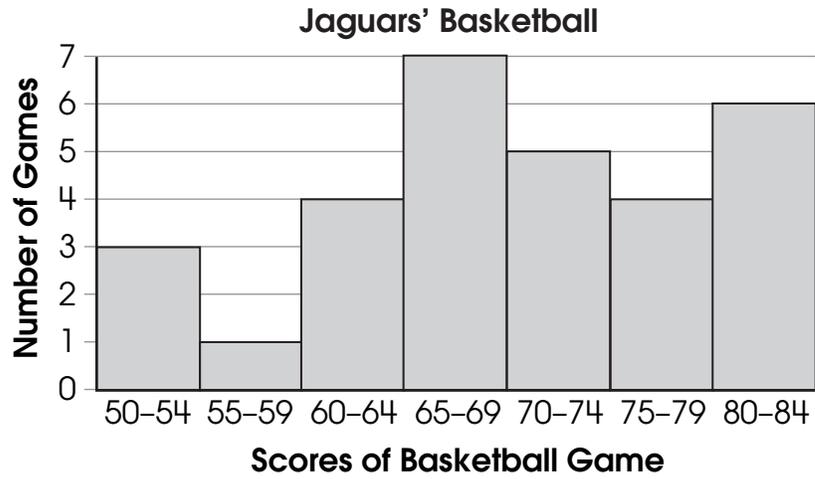
Items 28–30 have not been slated for public release in 2010.

31. A company plans to store boxes that measure 3 feet \times 2 feet \times 1.5 feet in a storage space that is 25 feet long, 10 feet wide and 12 feet high.

In your **Answer Document**, determine the maximum number of boxes that can be stored in the storage space. Show the mathematics you used to find the number of boxes.

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

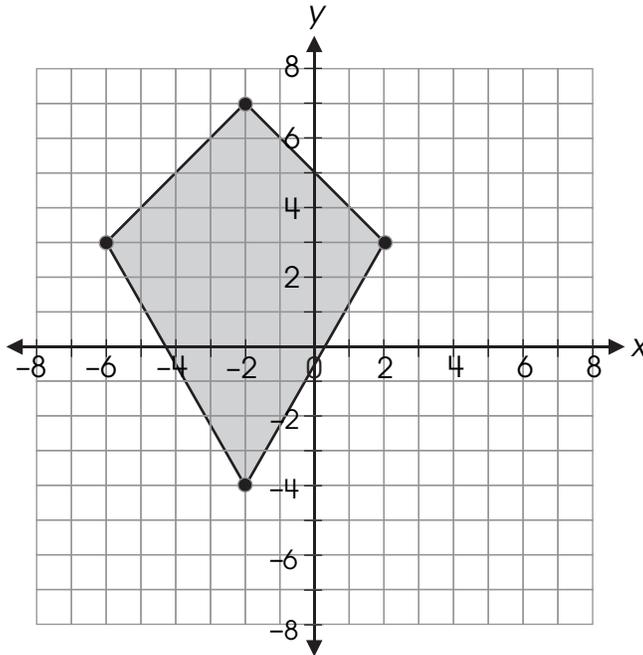
32. The histogram shows information about scores of the games played by the Jaguars basketball team during one season.



In how many games did the Jaguars score at least 65 points?

- A. 4
- B. 7
- C. 15
- D. 22

33. Carol is designing a kite on a coordinate plane.



Which ordered pair is located on the kite's line of symmetry?

- A. (-4, 3)
- B. (-2, 4)
- C. (0, 0)
- D. (0, 3)

Item 34 has not been slated for public release in 2010.

35. The table shows the number of games played and the number of games won by four sports teams at a middle school. None of the sports teams had a tie game during the season.

| Sports Team | Total Games Played | Number of Games Won |
|-------------|--------------------|---------------------|
| Basketball | 18 | 15 |
| Football | 7 | 4 |
| Golf | 14 | 8 |
| Softball | 20 | 18 |

Which sports team had the lowest loss-to-win ratio?

- A. basketball
- B. football
- C. golf
- D. softball

M

Mathematics

36. The equation of a line is $y = 2x + 1$.

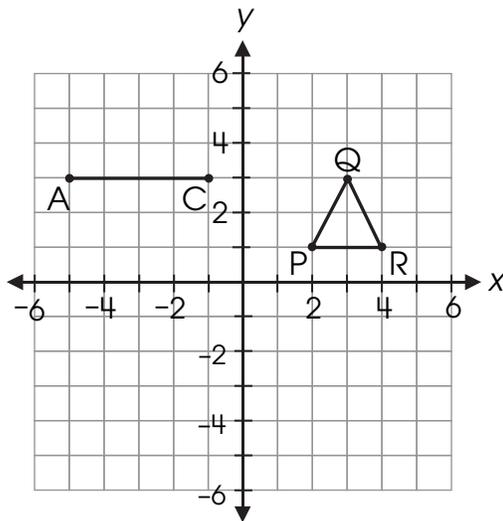
In your **Answer Document**, graph this line and give the coordinates of two points on the line.

For question 36, respond completely in your **Answer Document**. (2 points)



Items 37–39 have not been slated for public release in 2010.

40. Triangle PQR and line segment AC are shown.



Which ordered pair for a point B will create a triangle ABC that is similar to triangle PQR?

- A. $(-3, -1)$
- B. $(-3, 0)$
- C. $(-3, 5)$
- D. $(-1, -3)$

41. An expression is shown.

$$\left(\frac{7+7^2}{2(4)} - 2\right) + \sqrt{144}$$

What is the value of the expression?

- A. 17
- B. 18.75
- C. 21
- D. 115

42. A square is drawn on a coordinate plane.

Which transformation would change the perimeter of the square?

- A. a translation of 2 units down
- B. a reflection across the x -axis
- C. a dilation with a scale factor of 2
- D. a 90° clockwise rotation about the origin

43. The list shows the number of runs scored by a softball team for games played in April and May.

Runs Scored

April

0, 1, 5, 2, 0, 7, 1, 3

May

3, 8, 4, 1, 4, 9, 2

Which statement about these data is true?

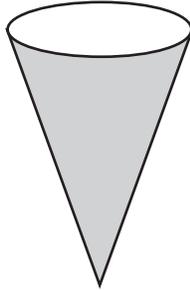
- A. The mean number of runs was greater in May than in April.
- B. The median number of runs was greater in April than in May.
- C. The mode of the number of runs in May was less than in April.
- D. The range of the number of runs was greater in April than in May.



44. The Smoothie Hut sells smoothies in cones and cups that are filled exactly to the top.



Cup

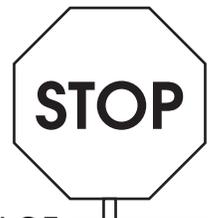


Cone

The cups and cones have the same diameter and height.

How much more does the cup hold than the cone?

- A. $\frac{1}{3}$ more
- B. $\frac{1}{2}$ more
- C. 2 times more
- D. 3 times more



M