

# Ohio's State Tests

**PRACTICE TEST**

**ALGEBRA I**

Student Name

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You can record a mixed number in several different ways. You can write it as:

a. A whole number and a fraction ( $15 \frac{1}{2}$ ).  
Be sure to include a space between the whole number and the fraction.

|   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|
| 1 | 5 |   | 1 | / | 2 |   |
| - | - | - | - | - | - | - |
| / | / | / | ● | / |   |   |
| ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| ● | 1 | 1 | ● | 1 | 1 | 1 |
| 2 | 2 | 2 | 2 | 2 | ● | 2 |
| 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| 5 | ● | 5 | 5 | 5 | 5 | 5 |
| 6 | 6 | 6 | 6 | 6 | 6 | 6 |
| 7 | 7 | 7 | 7 | 7 | 7 | 7 |
| 8 | 8 | 8 | 8 | 8 | 8 | 8 |
| 9 | 9 | 9 | 9 | 9 | 9 | 9 |

b. An equivalent fraction ( $31 \frac{1}{2}$ )

|   |   |   |   |   |   |
|---|---|---|---|---|---|
| 3 | 1 | / | 2 |   |   |
| - | - | - | - | - | - |
| / | ● | / | / | / |   |
| ○ | ○ | ○ | ○ | ○ | ○ |
| 0 | 0 | 0 | 0 | 0 | 0 |
| 1 | ● | 1 | 1 | 1 | 1 |
| 2 | 2 | 2 | ● | 2 | 2 |
| ● | 3 | 3 | 3 | 3 | 3 |
| 4 | 4 | 4 | 4 | 4 | 4 |
| 5 | 5 | 5 | 5 | 5 | 5 |
| 6 | 6 | 6 | 6 | 6 | 6 |
| 7 | 7 | 7 | 7 | 7 | 7 |
| 8 | 8 | 8 | 8 | 8 | 8 |
| 9 | 9 | 9 | 9 | 9 | 9 |

c. An equivalent decimal ( $15.5$ )

|   |   |   |   |   |   |
|---|---|---|---|---|---|
| 1 | 5 | . | 5 |   |   |
| - | - | - | - | - | - |
| / | / | / | / | / |   |
| ○ | ○ | ○ | ○ | ○ | ○ |
| 0 | 0 | 0 | 0 | 0 | 0 |
| ● | 1 | 1 | 1 | 1 | 1 |
| 2 | 2 | 2 | 2 | 2 | 2 |
| 3 | 3 | 3 | 3 | 3 | 3 |
| 4 | 4 | 4 | 4 | 4 | 4 |
| 5 | ● | 5 | ● | 5 | 5 |
| 6 | 6 | 6 | 6 | 6 | 6 |
| 7 | 7 | 7 | 7 | 7 | 7 |
| 8 | 8 | 8 | 8 | 8 | 8 |
| 9 | 9 | 9 | 9 | 9 | 9 |

## Directions:

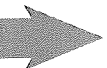
Today you will be taking the Ohio Algebra I Practice Assessment.

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 in your Answer Document.
2. Use only a #2 pencil to answer questions on this test.
3. For questions with bubbled responses, choose the correct answer and then fill in the circle with the appropriate letter in your Answer Document. Make sure the number of the question in this Student Test Booklet matches the number in your Answer Document. 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.
4. For questions with response boxes, 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. Make sure the number of the question in this Student Test Booklet matches the number in your Answer Document.
5. 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.
6. Check over your work when you are finished.

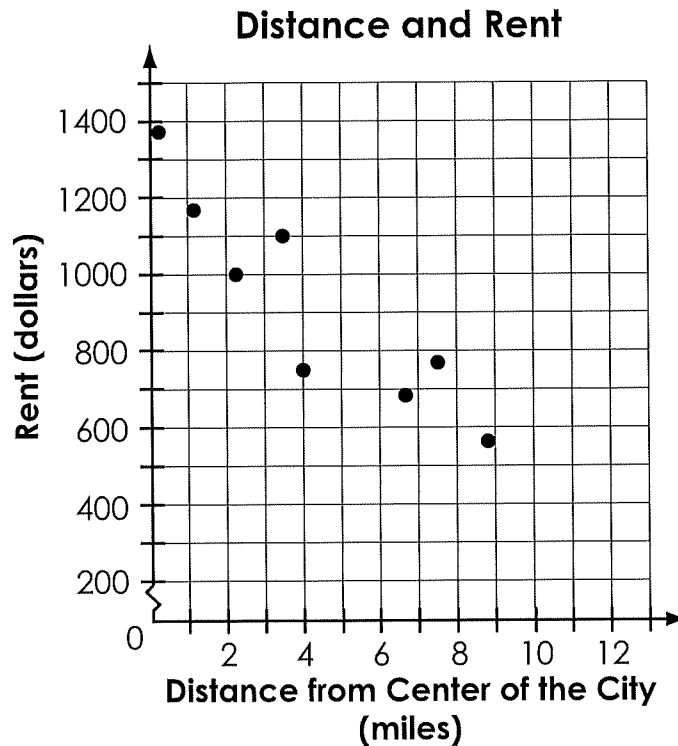
1.

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2. Juan wants to rent a house. He gathers data on many similar houses. The distance from the center of the city,  $x$ , and the monthly rent for each house,  $y$ , are shown in the scatter plot. Juan models the data with a linear equation.



Based on the scatter plot, what could the number 1275 represent in his equation?

- A. The estimated rent for a house in the center of the city
- B. The estimated minimum rent for a house far from the center of the city
- C. The estimated change in rent for each additional mile from the center of the city
- D. The estimated change in distance from the center of the city for each dollar change in rent

3.

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4.

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6. Fred solved the equation  $8(3x - 7) = -6(x + 7) + 4$  as shown.

|               |                             |
|---------------|-----------------------------|
| <b>Given</b>  | $8(3x - 7) = -6(x + 7) + 4$ |
| <b>Step 1</b> | $24x - 56 = -6x - 42 + 4$   |
| <b>Step 2</b> | $24x - 56 = -6x + 46$       |
| <b>Step 3</b> | $30x = 102$                 |
| <b>Step 4</b> | $x = \frac{17}{5}$          |

Fred made an error between Step 1 and Step 2.

- A. Explain the error that Fred made.
- B. What is the solution to the original equation?

Write your answers in the **Answer Document**.

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8.

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9. An analyst researches the relationship between different energy sources in each state for 2014. The data in the table show the number of states that use coal and nuclear power as an energy source.

|      |     | Nuclear |    |
|------|-----|---------|----|
|      |     | Yes     | No |
| Coal | Yes | 16      | 20 |
|      | No  | 2       | 12 |

Given that a state does not use nuclear power, what percentage of those states use coal?

Complete the response grid in the **Answer Document**.

## Algebra I—Part 1

10. A group of students measures the distance a toy car has traveled after different amounts of time. A table of the data is shown.

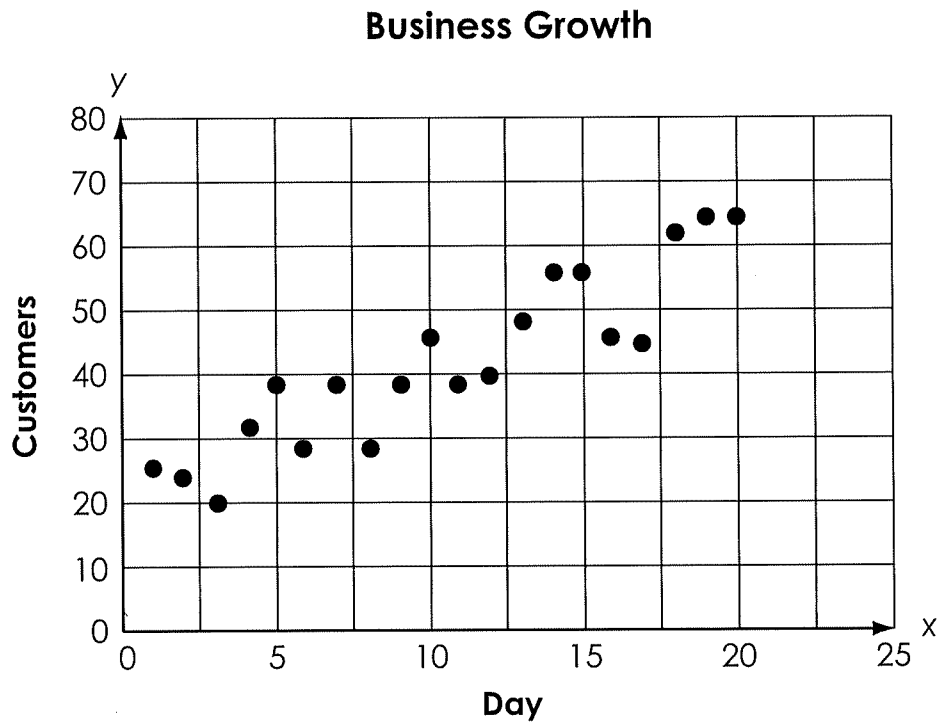
| Time (seconds) | Distance (meters) |
|----------------|-------------------|
| 5              | 1.0               |
| 6              | 1.2               |
| 7              | 2.4               |
| 8              | 3.3               |
| 9              | 3.7               |
| 10             | 11.0              |
| 11             | 4.2               |
| 12             | 3.7               |
| 13             | 4.8               |
| 14             | 4.5               |
| 15             | 4.9               |

The students want to perform an analysis of the data set and consider removing the outlier point.

In the **Answer Document**, select all of the quantities that will change if the outlier point is removed from the data set.

- A. mean of the time
- B. mean of the distance
- C. median of the time
- D. median of the distance
- E. range of the time
- F. range of the distance

11. Ms. Musto opened a new coffee shop. She recorded the number of customers she served between opening and noon for the first 20 days of business. Her results are shown on the graph.



Which line best fits the data?

- A.  $y = 3x + 10$
- B.  $y = 2x + 20$
- C.  $y = 3x + 30$
- D.  $y = x + 20$

12. A linear model shows that the relationship between the number of grocery items purchased and the total cost of the grocery bill has a correlation coefficient of 0.97.

Which statement about the variables is true?

- A. Purchasing more items causes a higher cost of the grocery bill.
  - B. If a grocery bill has a higher cost, then more items must have been purchased.
  - C. There is no relationship between the number of items purchased and the total cost of the grocery bill.
  - D. There is a strong relationship between the number of items purchased and the total cost of the grocery bill.
13. Which expression is equivalent to  $(2x^2 + 3)(x + 4)$ ?

- A.  $2x^3 + 12$
- B.  $2x^2 + 11x + 12$
- C.  $2x^3 + 6x^2 + 4x + 12$
- D.  $2x^3 + 8x^2 + 3x + 12$

14. Juan buys peaches and grapefruit at the store. He writes the equations shown to model the relationship between the number of pounds of peaches,  $p$ , and the number of pounds of grapefruit,  $g$ , that he buys.

$$p + g = 2.5$$

$$1.58p + 1.09g = 3.46$$

What is the total number of pounds of peaches and grapefruit that Juan buys?

Complete the response grid in the **Answer Document**.

15. In the **Answer Document**, select all of the expressions that are equivalent to  $9x^4 - y^2$ .

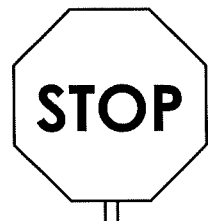
A.  $(3x^2 - y)^2$

B.  $(3x^2)^2 - (y)^2$

C.  $9(x^2)^2 - (y)^2$

D.  $(9x^2)^2 - (y)^2$

E.  $(3x^2 + y)(3x^2 - y)$





Do not go on

Do not go on

## Algebra I—Part 2

1. The population of rabbits on a large island doubles every year. On January 1, the population is 150 rabbits.

Which equation can be used to find the number of years,  $x$ , it will take for the population to reach 4,800?

- A.  $4,800 = 2x + 150$
- B.  $4,800 = 2 \cdot 150^x$
- C.  $4,800 = 2^x + 150$
- D.  $4,800 = 150 \cdot 2^x$

2.

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3.

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4. An equation is shown.

$$y = \frac{1}{2}x + \frac{3}{4}$$

In the **Answer Document**, select all of the points that are contained in the graph of the equation.

A.  $(0, \frac{1}{2})$

B.  $(0, \frac{3}{4})$

C.  $(\frac{3}{4}, 0)$

D.  $(\frac{3}{4}, \frac{1}{2})$

E.  $(\frac{1}{2}, 1)$

5. A function is shown.

$$f(x) = \frac{2}{3}x + 3$$

What is the value of  $f(12)$ ?

Complete the response grid in the **Answer Document**.

## Algebra I—Part 2

6. A grasshopper jumps off of a tree stump. The height, in feet, of the grasshopper above the ground after  $t$  seconds is modeled by the function shown.

$$h(t) = -t^2 + \frac{4}{3}t + \frac{1}{4}$$

After how many seconds will the grasshopper land on the ground?

Complete the response grid in the **Answer Document**.

7. An equation of a function  $y(t)$  is shown.

$$y(t) = -t^2 + 14t - 40$$

In the **Answer Document**, select all of the statements that are true about the graph of  $y(t)$  for  $6 \leq t \leq 8$ .

- A. The value of  $y(t)$  increases over the interval  $6 \leq t \leq 7$ .
- B. The value of  $y(t)$  increases over the interval  $7 \leq t \leq 8$ .
- C. The average rate of change over the interval  $6 \leq t \leq 8$  is 0.
- D. The value of  $y(t)$  is constant over the interval  $6 \leq t \leq 8$ .
- E. The average rate of change over the interval  $6 \leq t \leq 7$  is the same as the average rate of change over the interval  $7 \leq t \leq 8$ .

8.

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9.

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10. Which expression is equivalent to  $(8x^3)^{\frac{2}{3}}$ ?

A.  $4x^2$

B.  $4x^3$

C.  $\sqrt{8x^9}$

D.  $\sqrt{(8x^3)^3}$

## Algebra I—Part 2

11. A shipping company charges a cost per pound plus a fixed fee to ship a package. The total cost,  $f(x)$ , in dollars, of shipping  $x$  pounds is modeled by the function shown.

$$f(x) = 4.99x + 5.75$$

Which part of the function represents the fixed fee?

- A.  $x$
  - B. 4.99
  - C. 5.75
  - D.  $4.99x$
12. A theater sells tickets for a concert. Tickets for lower-level seats sell for \$35 each, and tickets for upper-level seats sell for \$25 each. The theater sells 350 tickets for \$10,250.

How many tickets of each type were sold?

Complete the response grids in the **Answer Document**.



13. A function is shown.

$$f(x) = 5(x - 2)^2 + 3$$

What is the minimum value of the function?

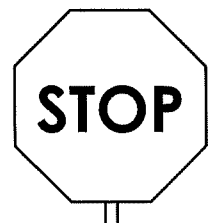
Complete the response grid in the **Answer Document**.

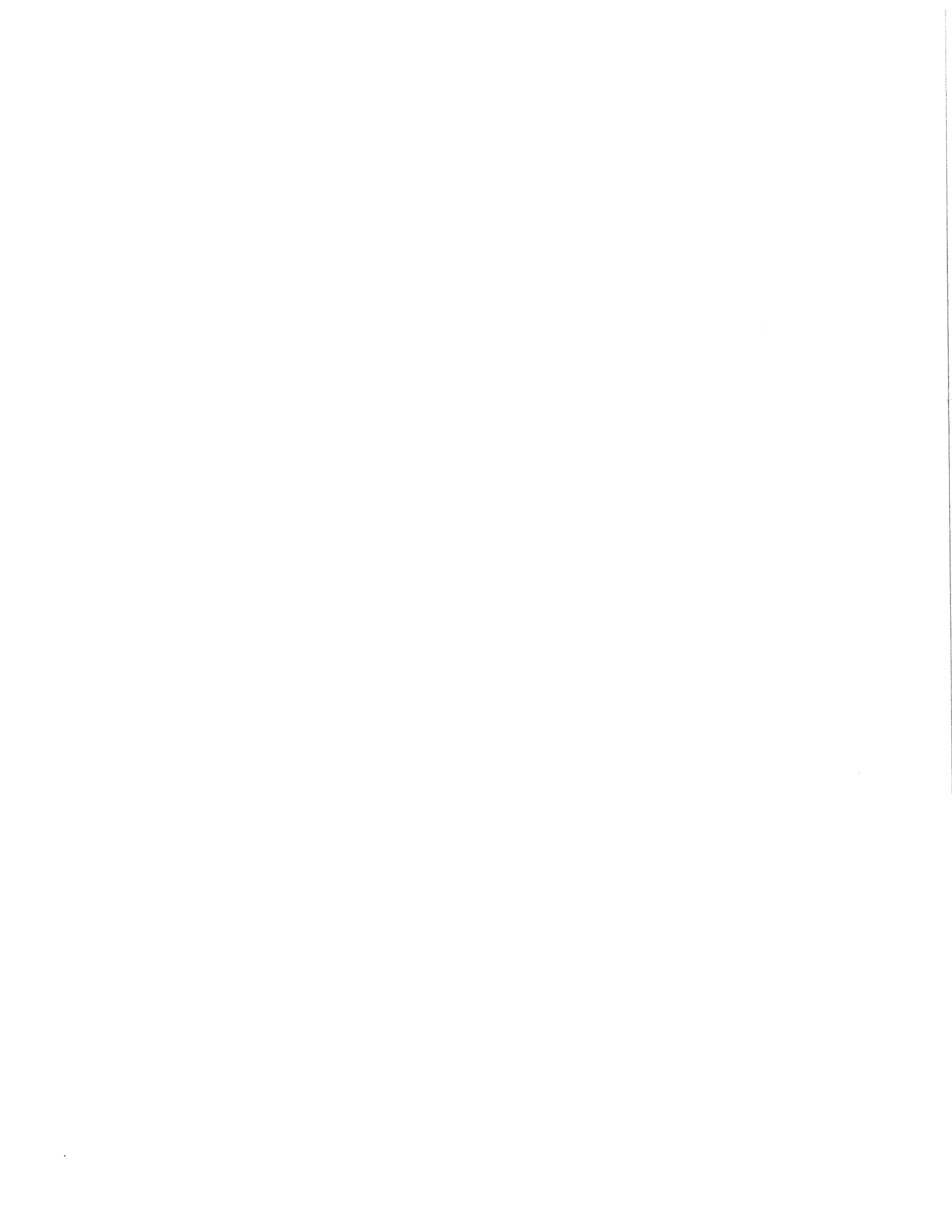
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15.

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## Ohio State Test Reference Sheet High School

1 foot = 12 inches

1 yard = 3 feet

1 mile = 1,760 yards

1 mile = 5,280 feet

1 mile  $\approx$  1.609 kilometers

1 inch = 2.54 centimeters

1 kilometer  $\approx$  0.62 mile1 meter  $\approx$  39.37 inches

1 pound = 16 ounces

1 pound  $\approx$  0.454 kilograms1 kilogram  $\approx$  2.2 pounds

1 cup = 8 fluid ounces

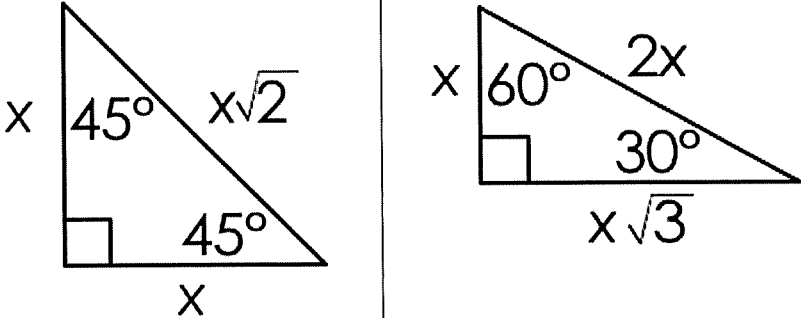
1 pint = 2 cups

1 quart = 2 pints

1 gallon = 4 quarts

1 gallon  $\approx$  3.785 liters1 liter  $\approx$  0.264 gallons

1 liter = 1000 cubic centimeters

| Trigonometry   |  |  |
|--|--|--|
| $\sin A = \frac{\text{opposite}}{\text{hypotenuse}}$ |  |  |
| $\cos A = \frac{\text{adjacent}}{\text{hypotenuse}}$ |  |  |
| $\tan A = \frac{\text{opposite}}{\text{adjacent}}$   |  |  |

| Key               |                           |                     |                     |
|-------------------|---------------------------|---------------------|---------------------|
| $b = \text{base}$ | $B = \text{area of base}$ | $h = \text{height}$ | $r = \text{radius}$ |

|                      |                                |
|----------------------|--------------------------------|
| <b>Triangle</b>      | $A = \frac{1}{2} b h$          |
| <b>Parallelogram</b> | $A = b h$                      |
| <b>Circle</b>        | $C = 2 \pi r$<br>$A = \pi r^2$ |

|                       |                             |
|-----------------------|-----------------------------|
| <b>General Prisms</b> | $V = B h$                   |
| <b>Cylinder</b>       | $V = \pi r^2 h$             |
| <b>Sphere</b>         | $V = \frac{4}{3} \pi r^3$   |
| <b>Cone</b>           | $V = \frac{1}{3} \pi r^2 h$ |
| <b>Pyramid</b>        | $V = \frac{1}{3} B h$       |

|                          |  |
|--------------------------|--|
| <b>Distance Formula</b>  | $d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$               |
| <b>Quadratic Formula</b> | $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$                 |
| <b>Addition Rule</b>     | $P(A \text{ or } B) = P(A) + P(B) - P(A \text{ and } B)$ |