Maine Through Year Assessment

Item Type Sampler
Mathematics
Grade 7

Student's Name:

Maine Department of Education

Directions:

On the following pages of your booklet are questions for the Grade 7 *Maine Through Year Assessment Mathematics* Item Type Sampler.

Read these directions carefully before beginning this item type sampler.

This item type sampler will include several different types of questions. Multiple Choice questions will ask you to select a single answer. Multiple Select questions will ask you to select multiple correct answers from among five or more answer choices. For some questions, there may be two parts, Part A and Part B, where each part has a Multiple Choice or Multiple Select question.

For all questions:

• Read each question carefully and choose the best answer.
• You may use scratch paper to solve the problems.
• The Mathematics Reference Sheet is provided in the back of the Mathematics section. You may refer to this page at any time during the sampler.
• You may use a calculator ONLY for questions 1–3. You may NOT use a calculator for any other questions on this sampler.
• Be sure to answer ALL the questions.

When you come to the word STOP at the end of Part 1, you have finished Part 1 of the Grade 7 Mathematics Item Type Sampler. You may review ONLY Part 1 to check your answers. Your calculator must be collected before you can continue with Part 2. When your calculator has been collected, and your proctor has given you permission, you may move on to Part 2.

When you are finished with Part 2, you may review ONLY Part 2 to check your answers.

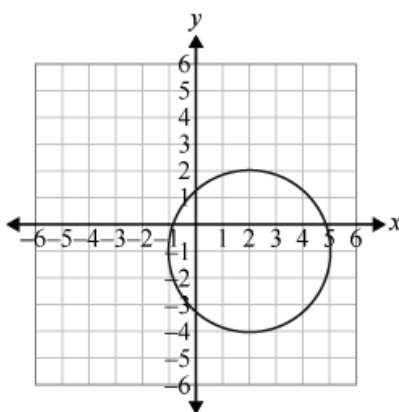**STOP.**

1. **Use the equation to answer the question.**

$$4\left(x - \frac{1}{2}\right) = -12$$

What is the solution to the equation?

A. $x = -16\frac{1}{2}$

B. $x = -15\frac{1}{2}$

C. $x = -3\frac{1}{2}$

D. $x = -2\frac{1}{2}$

2.   Use the graph to answer the questions.

Part A

What is the area of the circle?

A. 18.84 square units

B. 19.63 square units

C. 28.26 square units

D. 36.00 square units

Part B

What is the circumference of the circle?

A. 15.70 units

B. 18.84 units

C. 28.26 units

D. 37.68 units

Go on to the next page.

3. A marble is to be selected from a bag of marbles at the same time a spinner is spun. The probability of selecting a green marble out of the bag and the spinner landing on the color green is 0.76. The probability of landing on the color green on the spinner is 0.8. What is the probability of selecting a green marble out of the bag?

    A. 0.04

    B. 0.72

    C. 0.78

    D. 0.95

THIS IS THE END OF THE
CALCULATOR SECTION OF THE TEST

You may NOT use a calculator for any other questions on this test.

Raise your hand and notify your Test Administrator or Proctor that you are ready to turn in your calculator.

Once your Proctor has collected your calculator and given you permission, you may go on to the non-calculator section of the test.

STOP.

4. Which table shows a proportional relationship?

A.

x	y
0	0
2	4
4	6
6	8

B.

x	y
0	0
2	4
4	8
6	12

C.

x	y
0	2
2	4
4	8
6	16

D.

x	y
0	4
2	6
4	8
6	10

5. A group of science students is measuring the temperature of a water sample over time. One student says the temperature change, in degrees, between 8:00 a.m. and 10:00 a.m. can be modeled by the expression −7 × −2. Which explanation BEST matches this expression?

A. The temperature of the sample increased 2 degrees each hour for 7 hours.

B. The temperature of the sample decreased 2 degrees each hour for 7 hours.

C. The temperature of the sample increased 7 degrees each hour for 2 hours.

D. The temperature of the sample decreased 7 degrees each hour for 2 hours.

Go on to the next page.

6. Which expression is equivalent to $-19 - 4$?

    A. $-19 + (-4)$

    B. $-19 + 4$

    C. $19 + (-4)$

    D. $19 + 4$

7. **Use the equation to answer the question.**

    $$10x - 0.5 = -6$$

    Which value of x makes the equation true?

    A. -1.1

    B. -0.65

    C. -0.55

    D. -0.1

8. Circle J has a radius of 10 centimeters. Which expression represents the area, in square centimeters, of circle J?

    A. 10π

    B. 25π

    C. 100π

    D. 400π

Go on to the next page.

9. A store item that normally sells for p dollars is now on sale for $0.70p$.

Which expression is another way of writing the price of the store item that shows the discount rate?

A. $1 - 0.30p$

B. $p - 0.30p$

C. $p - 0.30$

D. $0.30p$

10. Which events are impossible? Select **all** that apply.

A. A bag contains 499 blue chips and 1 green chip. A green chip is drawn.

B. A spinner with 100 equal sections, labeled 1 through 100, is spun. The result is 47.

C. Two number cubes with sides labeled 1 through 6 are rolled. The results add up to 1.

D. A two-sided coin with sides labeled heads and tails is flipped 10 times. The results of exactly five flips are heads.

E. A deck contains 30 numbered cards. There are three cards of each number from 1 through 10. Four cards numbered 4 are drawn without replacement.

Go on to the next page.

11. A coat is on sale for 40% off the original price. The original price of the coat is $60. A person calculated the sale price of the coat using the following steps.

$$60 \times 0.40 = 24$$
$$40 - 24 = 16$$

An error was made in the calculation. Which statement explains the error that was made?

A. The person calculated the discount amount and not the sale price.

B. The person made a multiplication error when calculating the discount amount.

C. The person subtracted instead of added the discount amount to the percent discount.

D. The person subtracted the discount amount from the percent discount instead of the original price.

12. Which expressions are equivalent to $-12a + 28ab$? Select **all** that apply.

A. $16ab$

B. $28ab - 12a$

C. $-4a(3 + 7b)$

D. $4a(-3 + 7b)$

E. $4ab(-3 + 7)$

F. $a(-12 + 28ab)$

13. Angle G and angle H are supplementary. The measure of angle G is 80°.

    What is the measure of angle H?

    A. 100°

    B. 80°

    C. 20°

    D. 10°

14. Which statement explains why randomization results in the most representative sample?

    A. Randomization ensures that the members selected from the population result in a biased sample.

    B. Randomization ensures that the members selected from the population have all the same attributes.

    C. Randomization ensures that each member of the population has an equal chance of being selected.

    D. Randomization ensures that no member selected from the population will know who is in the sample.

15. A painter finishes painting $\frac{3}{8}$ room in $\frac{2}{3}$ hour. At this rate, how many rooms can the painter finish painting in 1 hour?

    A. $\frac{1}{4}$ room

    B. $\frac{9}{16}$ room

    C. $1\frac{1}{8}$ rooms

    D. $1\frac{7}{9}$ rooms

       STOP.

Perimeter

The perimeter of a polygon is equal to the sum of the lengths of its sides.

Circumference of a Circle

$C = \pi d$ or $C = 2\pi r$

$\pi \approx 3.14$

Area

Triangle	$A = \frac{1}{2}bh$
Rectangle	$A = bh$ or $A = lw$
Circle	$A = \pi r^2$

Surface Area

The total area of the 2-dimensional surfaces that make up a 3-dimensional object.

Volume

Right Rectangular Prism	$V = lwh$ or $V = Bh$
Right Prism	$V = Bh$
Cylinder	$V = \pi r^2 h$
Cone	$V = \frac{1}{3}\pi r^2 h$
Sphere	$V = \frac{4}{3}\pi r^3$
Pyramid	$V = \frac{1}{3}Bh$

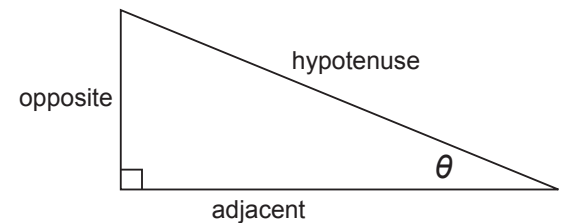## Slope Formula

$m = \dfrac{y_2 - y_1}{x_2 - x_1}$

Linear Equation

$y = mx + b$

Pythagorean Theorem

$a^2 + b^2 = c^2$

Definition of Trigonometric Functions

For $0° < \theta < 90°$,

$\sin \theta = \dfrac{\text{opposite}}{\text{hypotenuse}}$

$\cos \theta = \dfrac{\text{adjacent}}{\text{hypotenuse}}$

$\tan \theta = \dfrac{\text{opposite}}{\text{adjacent}}$

Mean

$\bar{x} = \dfrac{x_1 + x_2 + x_3 + \ldots + x_n}{n}$

Interquartile Range

$IQR = Q_3 - Q_1$

The difference between the third quartile and first quartile of a set of data.

Standard Deviation

$\sigma = \sqrt{\dfrac{\left(x_1 - \bar{x}\right)^2 + \left(x_2 - \bar{x}\right)^2 + \ldots + \left(x_n - \bar{x}\right)^2}{n}}$