



Our Students. Their Moment.

**New York State Testing Program  
Grade 7  
Mathematics Test**

**Released Questions**

**June 2018**

New York State administered the Mathematics Tests in May 2018 and is now making approximately 75% of the questions from these tests available for review and use.



THE STATE EDUCATION DEPARTMENT / THE UNIVERSITY OF THE STATE OF NEW YORK / ALBANY, NY 12234

# **New York State Testing Program Grades 3-8 Mathematics**

## **Released Questions from 2018 Exams**

### ***Background***

In 2013, New York State began administering tests designed to assess student performance in accordance with the instructional shifts and rigor demanded by the new New York State P-12 Learning Standards in Mathematics. To help in this transition to new assessments, the New York State Education Department (SED) has been releasing an increasing number of test questions from the tests that were administered to students across the State in the spring. This year, SED is again releasing large portions of the 2018 NYS Grades 3-8 English Language Arts and Mathematics test materials for review, discussion, and use.

For 2018, included in these released materials are at least 75 percent of the test questions that appeared on the 2018 tests (including all constructed-response questions) that counted toward students' scores. Additionally, SED is also providing a map that details what each released question measures and the correct response to each question. These released materials will help students, families, educators, and the public better understand the tests and the New York State Education Department's expectations for students.

### ***Understanding Math Questions***

#### **Multiple-Choice Questions**

Multiple-choice questions are designed to assess the New York State P-12 Learning Standards for Mathematics. Mathematics multiple-choice questions will be used mainly to assess standard algorithms and conceptual standards. Multiple-choice questions incorporate both the grade-level standards and the "Standards for Mathematical Practices." Many questions are framed within the context of real-world applications or require students to complete multiple steps. Likewise, many of these questions are linked to more than one standard, drawing on the simultaneous application of multiple skills and concepts.

#### **Short-Response Questions**

Short-response questions require students to complete tasks and show their work. Like multiple-choice questions, short-response questions will often require multiple steps, the application of multiple mathematics skills, and real-world applications. Many of the short-response questions will cover conceptual and application of the standards.

#### **Extended-Response Questions**

Extended-response questions ask students to show their work in completing two or more tasks or a more extensive problem. Extended-response questions allow students to show their understanding of mathematical procedures, conceptual understanding, and application. Extended-response questions may also assess student reasoning and the ability to critique the arguments of others.

The scoring rubric for short and extended constructed-response questions can be found in the grade-level Educator Guides at <https://www.engageny.org/resource/test-guides-english-language-arts-and-mathematics>.

### **New York State P-12 Learning Standards Alignment**

The alignment(s) to the New York State P-12 Learning Standards for Mathematics is/are intended to identify the primary analytic skills necessary to successfully answer each question. However, some questions measure proficiencies described in multiple standards, including a balanced combination of procedure and conceptual understanding. For example, two-point and three-point constructed-response questions require students to show an understanding of mathematical procedures, concepts, and applications.

### ***These Released Questions Do Not Comprise a "Mini Test"***

To ensure future valid and reliable tests, some content must remain secure for possible use on future exams. As such, this document is *not* intended to be representative of the entire test, to show how operational tests look, or to provide information about how teachers should administer the test; rather, its purpose is to provide an overview of how the test reflects the demands of the New York State P-12 Learning Standards.

The released questions do not represent the full spectrum of the standards assessed on the State tests, nor do they represent the full spectrum of how the standards should be taught and assessed in the classroom. It should not be assumed that a particular standard will be measured by an identical question in future assessments. Specific criteria for writing test questions, as well as additional assessment information, are available at <http://www.engageny.org/common-core-assessments>.

Name: \_\_\_\_\_



# *New York State Testing Program*

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## **2018 Mathematics Test Session 1**

## **Grade 7**

**May 1–3, 2018**

**Released Questions**

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**Session 1**

# Grade 7 Mathematics Reference Sheet

## CONVERSIONS

1 inch = 2.54 centimeters

1 meter = 39.37 inches

1 mile = 5,280 feet

1 mile = 1,760 yards

1 mile = 1.609 kilometers

1 kilometer = 0.62 mile

1 pound = 16 ounces

1 pound = 0.454 kilogram

1 kilogram = 2.2 pounds

1 ton = 2,000 pounds

1 cup = 8 fluid ounces

1 pint = 2 cups

1 quart = 2 pints

1 gallon = 4 quarts

1 gallon = 3.785 liters

1 liter = 0.264 gallon

1 liter = 1,000 cubic centimeters

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## FORMULAS

Triangle

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

Parallelogram

$$A = bh$$

Circle

$$A = \pi r^2$$

Circle

$$C = \pi d \text{ or } C = 2\pi r$$

General Prisms

$$V = Bh$$

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# Session 1



## TIPS FOR TAKING THE TEST

Here are some suggestions to help you do your best:

- Read each question carefully and think about the answer before making your choice.
- You have been provided with mathematics tools (a ruler, a protractor, and a calculator) and a reference sheet to use during the test. It is up to you to decide when each tool and the reference sheet will be helpful. You should use mathematics tools and the reference sheet whenever you think they will help you to answer the question.

1 What is the decimal equivalent of the fraction  $\frac{8}{15}$ ?

- A 0.53
- B  $0.5\bar{3}$
- C  $0.\bar{53}$
- D 0.533

2 The circumference of a circle is  $15\pi$  centimeters. What is the area of the circle in terms of  $\pi$ ?

- A  $7.5\pi \text{ cm}^2$
- B  $15\pi \text{ cm}^2$
- C  $56.25\pi \text{ cm}^2$
- D  $225\pi \text{ cm}^2$

3 Bob buys eggs and potatoes at a store.

- He pays a total of \$25.92.
- He pays \$2.57 for the eggs.
- He buys 5 bags of potatoes that each cost the same amount.

Which equation can be used to determine the cost,  $x$ , of each bag of potatoes?

- A  $x = (25.92 - 2.57) \div 5$
- B  $x = 25.92 \div 5 + 2.57$
- C  $x = (25.92 + 2.57) \div 5$
- D  $x = 25.92 \div 5 - 2.57$

**GO ON**



**6**

A spinner is divided into four colored sections that are not of equal size: red, blue, purple, and orange. The arrow on the spinner is spun several times.

**SPINNER RESULTS**

<b>Color</b>	<b>Number of Times</b>
Red	15
Blue	24
Purple	12
Orange	9

The arrow on the spinner will be spun one more time. Based on these results, what is the probability that the arrow will land on the purple section?

- A  $\frac{1}{4}$
- B  $\frac{1}{5}$
- C  $\frac{1}{6}$
- D  $\frac{1}{12}$

**GO ON**

7

The table below shows the lowest temperature, in degrees Fahrenheit, on each of 5 days for a city.

**LOWEST DAILY  
TEMPERATURES**

Day	Temperature( $^{\circ}$ F)
Monday	$-36^{\circ}$
Tuesday	$-25^{\circ}$
Wednesday	$12^{\circ}$
Thursday	$-3^{\circ}$
Friday	$18^{\circ}$

What is the mean lowest temperature, in degrees Fahrenheit, in the city for those 5 days?

- A  $-18.8^{\circ}$
- B  $-6.8^{\circ}$
- C  $6.8^{\circ}$
- D  $18.8^{\circ}$

**GO ON**

10 Which expression is equivalent to  $(-18) - 64n$ ?

- A  $-2(9 - 32n)$
- B  $2(9 - 32n)$
- C  $-2(9 + 32n)$
- D  $2(9 + 32n)$

11 Verda used a sensor to measure the speed of a moving car at different times. At each time, the sensor measured the speed of the car in both miles per hour and kilometers per hour. The table below shows her results.

**RECORDED SPEEDS**

Speed (miles per hour)	Speed (kilometers per hour)
11.0	17.699
26.0	41.834
34.0	54.706

Based on her results, which statement describes the relationship between  $m$ , the speed of the car in miles per hour, and  $k$ , the speed of the car in kilometers per hour?

- A The relationship is proportional because the ratio of  $m$  to  $k$  is constant.
- B The relationship is not proportional because the ratio of  $m$  to  $k$  is constant.
- C The relationship is proportional because the difference between  $m$  and  $k$  is constant.
- D The relationship is not proportional because the difference between  $m$  and  $k$  is constant.

16

Bonnie deposits \$70.00 into a new savings account.

- The account earns 4.5% simple interest per year.
- No money is added or removed from the savings account for 3 years.

What is the total amount of money in her savings account at the end of the 3 years?

- A \$9.45
- B \$79.45
- C \$94.50
- D \$164.50

17

Which situation results in a final value of zero?

- A The temperature after a decrease of  $5^{\circ}\text{F}$  from a temperature of  $-5^{\circ}\text{F}$ .
- B The height of an airplane after taking off from ground level and rising 1,000 feet.
- C The amount of money received in change after making a \$10 purchase with a \$20 bill.
- D The distance above sea level after increasing 24 meters from a depth of 24 meters below sea level.

**GO ON**

22

Three classes at a junior high school raised money to buy new computers.

- Ms. Moore's class raised \$249.00.
- Ms. Aguilar's class raised \$396.62 more than Ms. Moore's class.
- Mr. Barry's class raised \$430.43 less than Ms. Aguilar's class.

What is the total amount of money raised by all three classes?

- A \$215.19
- B \$464.19
- C \$1,076.05
- D \$1,109.81

23

A farm grew 19.8 tons of wheat in 2013. The farm's wheat output increased by 9.8% from 2013 to 2014 and by 5.1% from 2014 to 2015. Which expression represents a strategy for estimating the total output of wheat, in tons, in 2015?

- A  $20 + 10 + 5$
- B  $20(10)(5)$
- C  $20 + 1.1 + 1.05$
- D  $20(1.1)(1.05)$

26

Lea wants to save money on a new computer. At the store near her, the computer she wants is listed at a regular price of \$400.00.

- On Saturday, the store will have a sale and discount the computer by 30%.
- Shoppers who buy a computer that same Saturday before 9:00 a.m. will also receive an additional 10% off the sale price.

How much will Lea pay, without tax, when she buys the computer that Saturday before 9:00 a.m.?

- A \$148.00
- B \$160.00
- C \$240.00
- D \$252.00

27

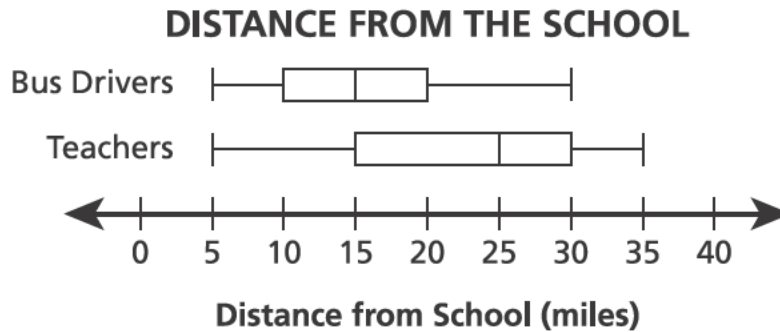
Which expression can go in the blank to make the equation true?

$$-4.5 + 4.4 + \underline{\quad ? \quad} = 0$$

- A  $-6.7 + 6.8$
- B  $-6.7 + (-6.6)$
- C  $7.2 + (-7.2)$
- D  $7.2 + (-7.3)$

28

A principal gathered data about the distance, in miles, that his teachers and bus drivers live from the school. The box plots below show these data.



Based on the box plots, which statement is true?

- A The interquartile range of the distances for the bus drivers is twice the interquartile range of the distances for the teachers.
- B The range of the distances for the teachers is twice the range of the distances for the bus drivers.
- C The interquartile range of the distances for the bus drivers is 5 miles less than the interquartile range of the distances for the teachers.
- D The range of the distances for the teachers is 5 miles less than the range of the distances for the bus drivers.

29

At midnight, the temperature was  $-8^{\circ}\text{F}$ . At noon, the temperature was  $23^{\circ}\text{F}$ .

Which expression represents the increase in temperature?

- A  $-8 - 23$
- B  $|-8| - 23$
- C  $-8 - |23|$
- D  $|-8 - 23|$

**GO ON**

30

A spinner with seven equal-sized sections was used to play a game.

- It was used 250 times in the first game.
- Of those 250, the arrow landed on section 7 a total of 35 times.
- The same spinner was used 150 times in the second game.

How many times did the spinner **most likely** land on section 7 in the second game?

- A 14
- B 21
- C 30
- D 35

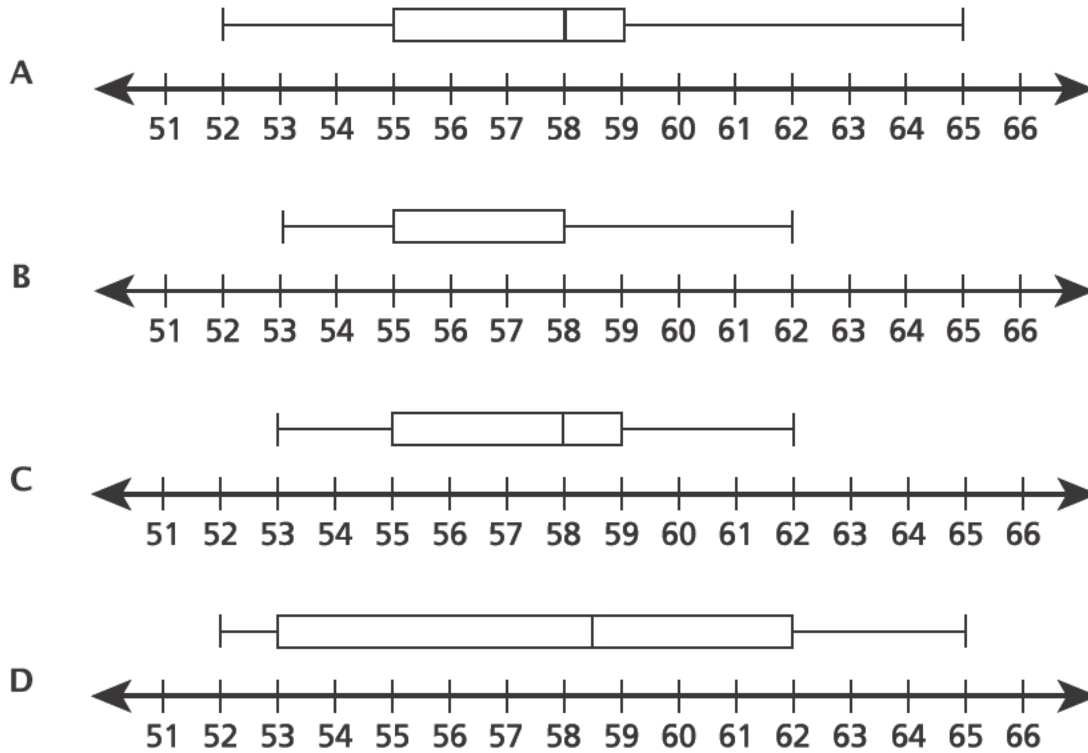


31

Amanda surveyed 13 students in her class about their heights in inches. Her data are listed below.

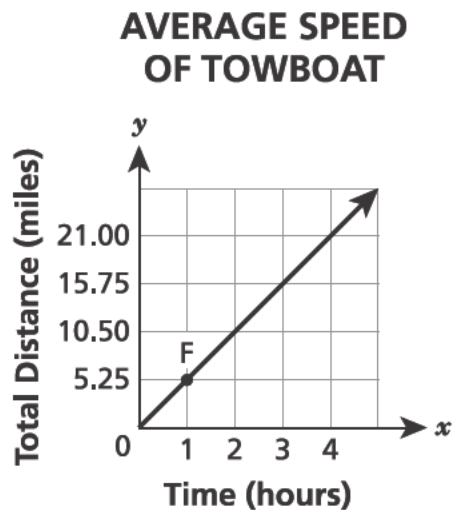
52, 53, 55, 55, 56, 57, 58, 58, 59, 59, 59, 62, 65

Which box plot correctly displays her data?



GO ON

The graph below shows the total distance, in miles, traveled by a towboat over time, in hours.



Which statement **best** describes the meaning of the coordinates of point F on the graph?

- A It shows the unit rate of the graph in hours per mile.
- B It shows the unit rate of the graph in miles per hour.
- C It shows the time, in hours, it takes the towboat to travel 1 mile.
- D It shows the distance traveled, in miles, by the towboat after 5.25 hours.

33

A computer program selects blue, red, or green as the background color each time the program is used.

- The program was used 45 times on the same computer in one week.
- Of those 45 times, a blue background appeared 12 times and a red background appeared 21 times.

Based on this information, which statement about the likelihood of the green background appearing the next time the program is used is true?

- A Green is just as likely as red or blue to appear.
- B Green is just as likely as blue to appear, but not as likely as red.
- C Green is not as likely as red or blue to appear.
- D Green is not as likely as blue to appear, but is as likely as red.

**STOP**

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**Grade 7**  
**2018**  
**Mathematics Test**  
**Session 1**  
May 1–3, 2018

Name: \_\_\_\_\_



# *New York State Testing Program*

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## **2018 Mathematics Test Session 2**

## **Grade 7**

**May 1–3, 2018**

**Released Questions**

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1 pound = 0.454 kilogram

1 kilogram = 2.2 pounds

1 ton = 2,000 pounds

1 cup = 8 fluid ounces

1 pint = 2 cups

1 quart = 2 pints

1 gallon = 4 quarts

1 gallon = 3.785 liters

1 liter = 0.264 gallon

1 liter = 1,000 cubic centimeters

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## FORMULAS

Triangle

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

Parallelogram

$$A = bh$$

Circle

$$A = \pi r^2$$

Circle

$$C = \pi d \text{ or } C = 2\pi r$$

General Prisms

$$V = Bh$$

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# Session 2



## TIPS FOR TAKING THE TEST

Here are some suggestions to help you do your best:

- Read each question carefully and think about the answer before making your choice or writing your response.
- You have been provided with mathematics tools (a ruler, a protractor, and a calculator) and a reference sheet to use during the test. It is up to you to decide when each tool and the reference sheet will be helpful. You should use mathematics tools and the reference sheet whenever you think they will help you to answer the question.
- Be sure to show your work when asked.



34 Which number represents the probability of an event that is very likely to occur?

- A 0.12
- B 1.3
- C 0.89
- D 0.09

35 Which expression is equivalent to  $n + n - 0.18n$ ?

- A  $1.18n$
- B  $1.82n$
- C  $n - 0.18$
- D  $2n - 0.82$

36 Nick is making bread dough.

- The recipe requires  $\frac{3}{4}$  cup of flour and  $1\frac{1}{8}$  teaspoons of salt.
- Nick wants to make the recipe using 1 cup of flour.

To maintain the ratio, how much salt is required when 1 cup of flour is used?

- A  $\frac{27}{32}$  teaspoon
- B  $\frac{2}{3}$  teaspoon
- C  $1\frac{1}{2}$  teaspoons
- D  $1\frac{7}{8}$  teaspoons

**GO ON**

37 Which expression is equivalent to  $-\frac{1}{3}(6x + 15) - 3$ ?

- A  $-2x + 12$
- B  $-2x + 2$
- C  $-2x - 2$
- D  $-2x - 8$

38 Josh has a rewards card for a movie theater.

- He receives 15 points for becoming a rewards card holder.
- He earns 3.5 points for each visit to the movie theater.
- He needs at least 55 points to earn a free movie ticket.

Which inequality can Josh use to determine  $x$ , the minimum number of visits he needs to earn his first free movie ticket?

- A  $55 \geq 3.5x + 15$
- B  $55 \geq 15x + 3.5$
- C  $55 \leq 3.5x + 15$
- D  $55 \leq 15x + 3.5$

- 39 At a store, a hat has a regular price of  $x$  dollars. During a sale, the price of the hat is discounted by 20%. The expression  $0.8x$  describes the discounted price, in dollars, of the hat. Which expression also describes the discounted price, in dollars, of the hat?

- A  $0.2x$
- B  $x - 20$
- C  $x - 0.2$
- D  $x - 0.2x$

- 40 Howard has a scale model of the Statue of Liberty.

- The model is 15 inches tall.
- The scale of the model to the actual statue is 1 inch : 6.2 meters.

Which equation can Howard use to determine  $x$ , the height in meters, of the Statue of Liberty?

- A  $15x = 6.2$
- B  $6.2x = 15$
- C  $\frac{1}{6.2} = \frac{x}{15}$
- D  $\frac{1}{6.2} = \frac{15}{x}$

**GO ON**

- 41 The rectangular floor of a classroom is 36 feet in length and 32 feet in width. A scale drawing of the floor has a length of 9 inches. What is the area, in square inches, of the floor in the scale drawing?

*Show your work.*

*Answer* \_\_\_\_\_ square inches

**GO ON**

42

Mr. Trager has \$500.00 to spend at a bicycle store. All prices listed below include tax.

- He buys a new bicycle for \$273.98.
- He buys 3 bicycle reflectors for \$7.23 each and 1 bicycle helmet for \$42.36.
- He plans to use the remaining money to buy new cycling outfits for \$78.12 each.

What is the **greatest** number of cycling outfits that Mr. Trager can buy with the remaining money?

*Show your work.*

*Answer* \_\_\_\_\_ cycling outfits

**GO ON**

43

Jim needs to rent a car. A rental company charges \$21.00 per day to rent a car and \$0.10 for every mile driven.

- He will travel 250 miles.
- He has \$115.00 to spend.

Write an inequality that can be used to determine  $d$ , the maximum number of days that Jim can rent a car.

**Inequality** \_\_\_\_\_

Jim believes the maximum whole number of days he can rent the car is 5. Is he correct? Why or why not?

**Explain your answer.**

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44

Jennifer has 84.5 yards of fabric to make curtains. She makes 6 identical curtains and has 19.7 yards of fabric remaining. How many yards of fabric does Jennifer use per curtain?

*Show your work or explain your answer.*

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*Answer* \_\_\_\_\_ yards of fabric per curtain

**GO ON**

45

Jen's goal is to run a total of 22 miles in five days. The table below shows her log for the number of miles she ran on Monday, Tuesday, Wednesday, and Thursday.

**JEN'S RUNNING LOG**

Day	Distance (miles)
Monday	$4\frac{3}{4}$
Tuesday	$5\frac{1}{8}$
Wednesday	0
Thursday	$6\frac{1}{4}$
Friday	?

How many miles must Jen run on Friday to reach her goal?

*Show your work.*

*Answer* \_\_\_\_\_ miles

**GO ON**



46

Mario is setting up a new tent during a camping trip. The tent came with 7 feet of rope. The instructions are to use 34.5 inches of the rope to tie a tarp on top of the tent. Then, the remaining rope should be cut into  $8\frac{1}{4}$ -inch sections to tie the tent to stakes in the ground. Mario will use all of the rope as instructed. Write and solve an equation to determine the number of  $8\frac{1}{4}$ -inch sections of rope Mario can cut from the rope.

*Show your work.*

*Answer* \_\_\_\_\_

**GO ON**

47

The table below shows the number of scooters sold at a store during a three-year period.

**SCOOTER SALES**

Year	Number Sold
Year 1	725
Year 2	579
Year 3	696

In Year 4, the store sold 112% of the total number of scooters sold during the previous three years combined. Determine the number of scooters sold in Year 4.

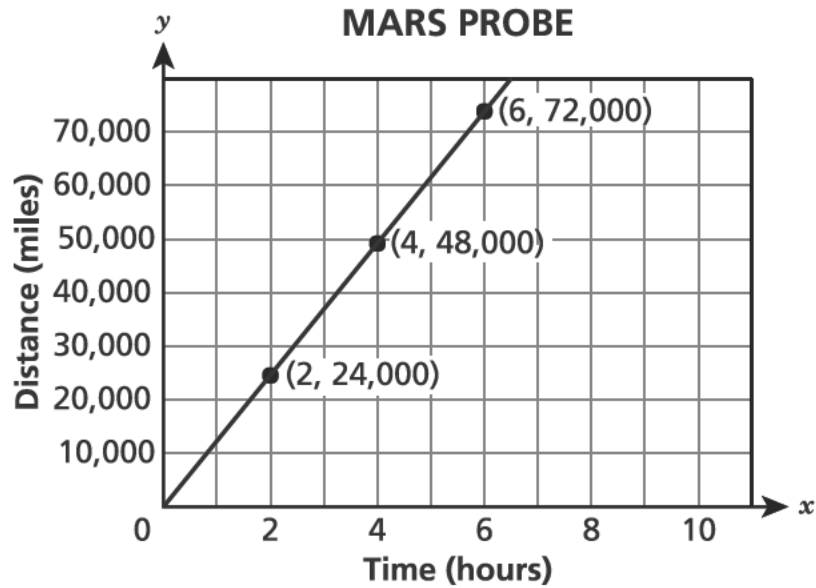
*Show your work.*

*Answer* \_\_\_\_\_ scooters

**GO ON**

48

The graph shows the relationship between  $x$ , the amount of time in hours, and  $y$ , the distance traveled in miles, by a probe before it reaches Mars.



Does the graph represent a proportional relationship? Why or why not?

*Justify your answer.*

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Determine the number of miles the probe travels in 5.5 hours.

*Show your work.*

*Answer* \_\_\_\_\_ miles

**STOP**

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**Grade 7**  
**2018**  
**Mathematics Test**  
**Session 2**  
May 1–3, 2018

**THE STATE EDUCATION DEPARTMENT**  
**THE UNIVERSITY OF THE STATE OF NEW YORK / ALBANY, NY 12234**  
**2018 Mathematics Tests Map to the Standards**  
**Grade 7 Released Questions on EngageNY**

Question	Type	Key	Points	Standard	Cluster	Multiple Choice Questions:	Constructed Response Questions:	
						Percentage of Students Who Answered Correctly (P-Value)	Average Points Earned	P-Value (Average Points Earned ÷ Total Possible Points)
<b>Session 1</b>								
1	Multiple Choice	B	1	CCSS.Math.Content.7.NS.A.2d	The Number System	0.83		
2	Multiple Choice	C	1	CCSS.Math.Content.7.G.B.4	Geometry	0.43		
3	Multiple Choice	A	1	CCSS.Math.Content.7.EE.B.4a	Expressions and Equations	0.75		
6	Multiple Choice	B	1	CCSS.Math.Content.7.SP.C.7b	Statistics and Probability	0.51		
7	Multiple Choice	B	1	CCSS.Math.Content.7.NS.A.3	The Number System	0.68		
10	Multiple Choice	C	1	CCSS.Math.Content.7.EE.A.1	Expressions and Equations	0.57		
11	Multiple Choice	A	1	CCSS.Math.Content.7.RP.A.2a	Ratios and Proportional Relationships	0.53		
16	Multiple Choice	B	1	CCSS.Math.Content.7.RP.A.3	Ratios and Proportional Relationships	0.54		
17	Multiple Choice	D	1	CCSS.Math.Content.7.NS.A.1a	The Number System	0.71		
22	Multiple Choice	D	1	CCSS.Math.Content.7.NS.A.3	The Number System	0.60		
23	Multiple Choice	D	1	CCSS.Math.Content.7.EE.B.3	Expressions and Equations	0.35		
26	Multiple Choice	D	1	CCSS.Math.Content.7.RP.A.3	Ratios and Proportional Relationships	0.49		
27	Multiple Choice	A	1	CCSS.Math.Content.7.NS.A.1d	The Number System	0.68		
28	Multiple Choice	C	1	CCSS.Math.Content.7.SP.B.3	Statistics and Probability	0.57		
29	Multiple Choice	D	1	CCSS.Math.Content.7.NS.A.1c	The Number System	0.33		
30	Multiple Choice	B	1	CCSS.Math.Content.7.SP.C.6	Statistics and Probability	0.58		

Question	Type	Key	Points	Standard	Cluster	Multiple Choice Questions:	Constructed Response Questions:	
						Percentage of Students Who Answered Correctly (P-Value)	Average Points Earned	P-Value (Average Points Earned ÷ Total Possible Points)
<b>Session 1 continued</b>								
31	Multiple Choice	A	1	CCSS.Math.Content.6.SP.B.4	Statistics and Probability	0.62		
32	Multiple Choice	B	1	CCSS.Math.Content.7.RP.A.2d	Ratios and Proportional Relationships	0.58		
33	Multiple Choice	B	1	CCSS.Math.Content.7.SP.C.7b	Statistics and Probability	0.54		
<b>Session 2</b>								
34	Multiple Choice	C	1	CCSS.Math.Content.7.SP.C.5	Statistics and Probability	0.46		
35	Multiple Choice	B	1	CCSS.Math.Content.7.EE.A.1	Expressions and Equations	0.40		
36	Multiple Choice	C	1	CCSS.Math.Content.7.RP.A.1	Ratios and Proportional Relationships	0.53		
37	Multiple Choice	D	1	CCSS.Math.Content.7.EE.A.1	Expressions and Equations	0.61		
38	Multiple Choice	C	1	CCSS.Math.Content.7.EE.B.4b	Expressions and Equations	0.49		
39	Multiple Choice	D	1	CCSS.Math.Content.7.EE.A.2	Expressions and Equations	0.39		
40	Multiple Choice	D	1	CCSS.Math.Content.7.G.A.1	Geometry	0.51		
41	Constructed Response		2	CCSS.Math.Content.7.G.A.1	Geometry		0.84	0.42
42	Constructed Response		2	CCSS.Math.Content.7.NS.A.3	The Number System		1.44	0.72
43	Constructed Response		2	CCSS.Math.Content.7.EE.B.4b	Expressions and Equations		0.86	0.43
44	Constructed Response		2	CCSS.Math.Content.7.EE.B.3	Expressions and Equations		1.2	0.60
45	Constructed Response		2	CCSS.Math.Content.7.NS.A.3	The Number System		1.32	0.66
46	Constructed Response		2	CCSS.Math.Content.7.EE.B.4a	Expressions and Equations		0.68	0.34
47	Constructed Response		2	CCSS.Math.Content.7.RP.A.3	Ratios and Proportional Relationships		1.1	0.55
48	Constructed Response		3	CCSS.Math.Content.7.RP.A.2b	Ratios and Proportional Relationships		1.38	0.46

\*This item map is intended to identify the primary analytic skills necessary to successfully answer each question. However, some questions measure proficiencies described in multiple standards, including a balanced combination of procedural and conceptual understanding.