



New York State Testing Program

Mathematics Test Book 1

Grade

7

March 9–13, 2009

1 Which set contains only whole numbers?

A $\{0, 3, 8, 17\}$

B $\{0, \sqrt{3}, \pi, 5\}$

C $\{-5, 0, 3, 8\}$

D $\left\{2, \frac{9}{2}, 7, \frac{25}{3}\right\}$

2 The table below shows the number of computers a company sold in four different years.

COMPUTERS SOLD

Year	Computers Sold
2002	3.2×10^5
2003	8.4×10^3
2004	5.9×10^5
2005	1.2×10^4

In what year did the company sell the **most** computers?

A 2002

B 2003

C 2004

D 2005

Go On

3

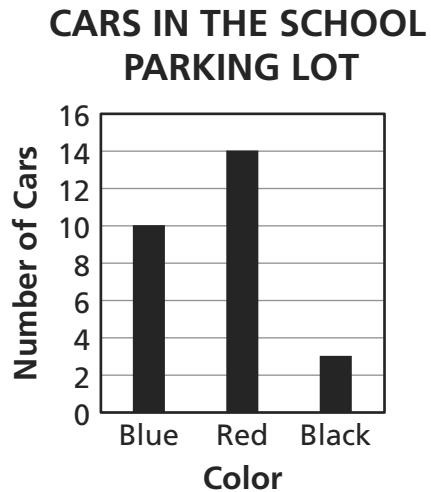
What is the surface area, in square centimeters, of a rectangular prism that has a length of 10 centimeters, a width of 5 centimeters, and a height of 6 centimeters?

$$\text{Surface Area} = 2wl + 2lh + 2wh$$

- A 140
- B 160
- C 280
- D 300

4

After school, the members of the car club counted the colors of cars parked in the school parking lot. They recorded their data on the bar graph below.



Based on information in the graph, which statement is true?

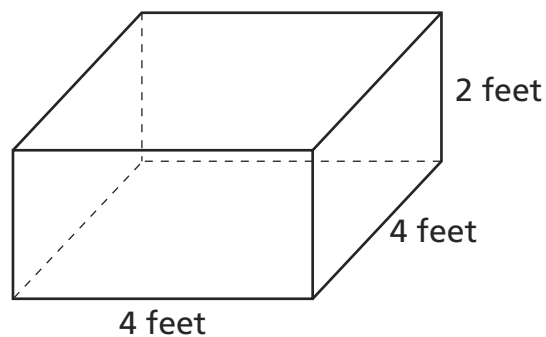
- A There are more black cars than red cars.
- B There are more black cars than blue cars.
- C There are more blue cars than red cars.
- D There are more blue cars than black cars.

- 5** The mass of a bag of potatoes is 4.5 kilograms. What is the mass, in grams, of the bag of potatoes?

1 kilogram = 1,000 grams

- A** 45
- B** 450
- C** 4,500
- D** 45,000

- 6** The figure below is a rectangular prism.



[not drawn to scale]

Which statement is true about the faces of this prism?

- A** All of the faces are squares.
- B** None of the faces are squares.
- C** Only two of the faces are squares.
- D** Only four of the faces are squares.

Go On

7

Eva surveys a large number of students at a movie theater about their favorite weekend activity. The table below shows the results of her survey.

FAVORITE WEEKEND ACTIVITY

Activity	Number of Students
Reading books	16
Playing sports	24
Playing video games	30
Watching movies	130

Based on the results of her survey, Eva concludes that the favorite weekend activity of most students is watching movies. Which statement **best** describes Eva's conclusion?

- A** Eva's conclusion is **not** valid because she surveyed only students.
- B** Eva's conclusion is valid because she surveyed a large number of students.
- C** Eva's conclusion is valid because she surveyed students from many schools.
- D** Eva's conclusion is **not** valid because she surveyed students at a movie theater.

8

The mass of a typical raindrop is 8.7×10^{-5} grams. What is 8.7×10^{-5} in standard form?

- A** 870,000
- B** 0.000087
- C** 8,700,000
- D** 0.0000087

9 Which tool would be **most appropriate** for Natasha to use when finding the mass of a watermelon?

- A** scale
- B** inch ruler
- C** meter stick
- D** measuring cup

10 Simplify the expression $(-4)(3)(-1)(-2)$.

- A** 4
- B** -4
- C** 24
- D** -24

11 Dennis buys 5.5 liters of soda for a party. How many milliliters are equivalent to 5.5 liters?

1 liter = 1,000 milliliters

- A** 55
- B** 550
- C** 5,500
- D** 55,000

Go On

12

Hiral performs an experiment by randomly selecting different-colored marbles from a jar. The results of his experiment are shown in the table below.

Marble Color	Frequency
Green	5
Blue	11
Red	8
Yellow	1

Based on the data, what is the probability that the next marble Hiral selects will be blue or red?

- A $\frac{1}{25}$
- B $\frac{6}{25}$
- C $\frac{19}{25}$
- D $\frac{24}{25}$

13

Breanna researches the density of corn syrup for a science experiment. She finds that the mass of 50 milliliters of corn syrup is 69 grams. What is the density, in grams per milliliter, of corn syrup?

$$\text{Density} = \frac{\text{Mass}}{\text{Volume}}$$

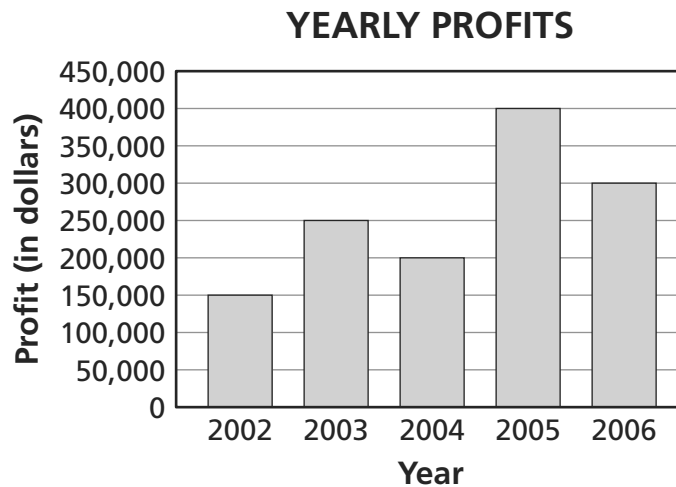
- A 119
- B 1.38
- C 3,450
- D 0.7246

- 14** Simplify the expression below.

$$|7 - 3^2| + 4$$

- A** 2
- B** 3
- C** 5
- D** 6

- 15** The graph below shows a restaurant's profit each year for 5 years.



Which year had the **greatest** increase in profit from the year before?

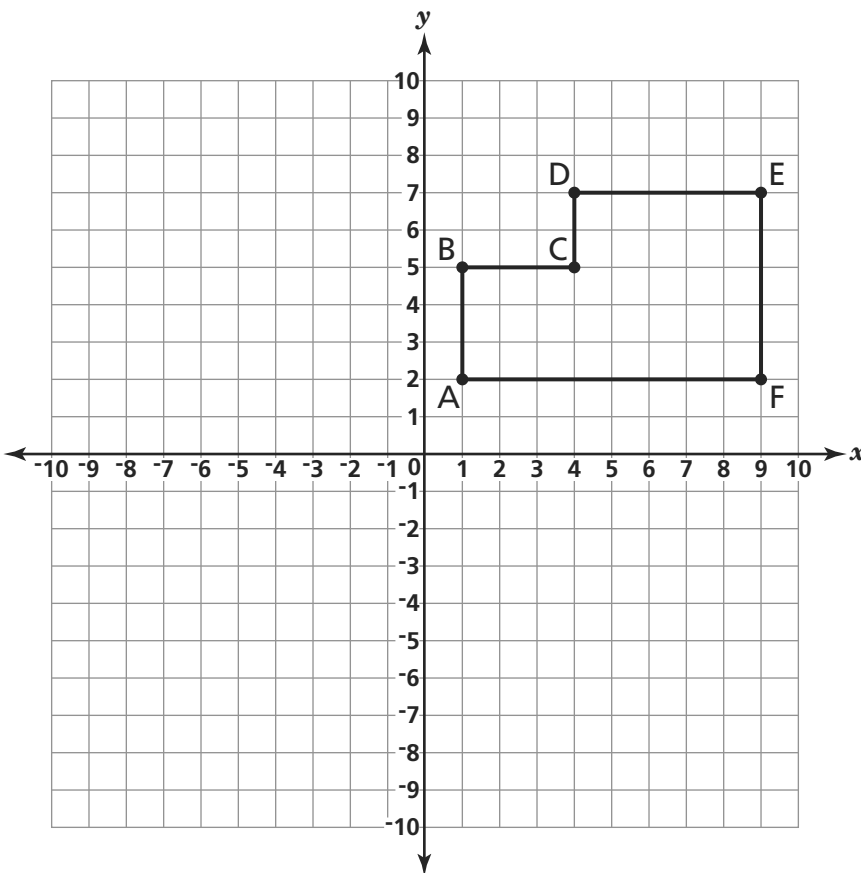
- A** 2003
- B** 2004
- C** 2005
- D** 2006

Go On

16 What whole number is the square root of 169?

- A** 12
- B** 13
- C** 14
- D** 15

17 Figure ABCDEF is plotted on the coordinate plane below.



KEY
<input type="checkbox"/> = 1 square unit

What is the area, in square units, of the figure?

- A** 40
- B** 34
- C** 26
- D** 25

18

The table below shows the low temperatures, in degrees Fahrenheit ($^{\circ}\text{F}$), in Millie's hometown for 5 days in February.

**FEBRUARY LOW
TEMPERATURES**

Day	Temperature
Monday	5°F
Tuesday	8°F
Wednesday	12°F
Thursday	7°F
Friday	2°F

What is the range, in degrees Fahrenheit, of the data in the table?

- A 2°
- B 7°
- C 10°
- D 12°

19

The length of each side of a cube is 2.05 centimeters long. What is the best estimation of the surface area of the cube in square centimeters?

Surface Area = $6s^2$

- A 16
- B 24
- C 32
- D 48

Go On

20 What is the greatest common factor (GCF) of 450 and 735?

- A** 3
- B** 5
- C** 15
- D** 35

21 Four students predicted how long it would take them to run around a city block. Their predictions and actual times are shown in the table below.

Student	Predicted Time (in seconds)	Actual Time (in seconds)
Angie	74	63
Rachael	61	70
Thomas	68	76
Jordan	65	72

Which student's predicted time is closest to his or her actual time?

- A** Angie
- B** Rachael
- C** Thomas
- D** Jordan

22 What expression represents 16 more than 5 times a number, n ?

- A $5n + 16$
- B $5n - 16$
- C $16n + 5$
- D $16n - 5$

23 The temperature, in degrees Fahrenheit ($^{\circ}\text{F}$), decreased at a constant rate from 0°F to -35°F in 5 hours. By how many degrees did the temperature decrease **per hour**?

- A 5°
- B 7°
- C 30°
- D 35°

24 A toy box has a volume of $\frac{1}{3}$ cubic yard. What is the volume of this toy box in cubic feet?

$1 \text{ cubic yard} = 27 \text{ cubic feet}$
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- A 1
- B $\frac{1}{9}$
- C $\frac{1}{81}$
- D 9

Go On

25

Sarah predicts that 15 percent of all the birds she spots while bird watching will be robins. At the end of the day, she records that 10 out of the 25 birds she spotted were robins. How does Sarah's prediction compare with the actual results?

- A** Sarah's prediction is too low.
- B** Sarah's prediction is too high.
- C** Sarah's prediction cannot be compared to the actual results.
- D** Sarah's prediction is exactly the same as the actual results.

26

If the circumference of a circle is doubled, how does the diameter of the circle change?

- A** The diameter stays the same.
- B** The diameter becomes half as long.
- C** The diameter becomes twice as long.
- D** The diameter becomes four times as long.

27 Peter has 6 sweaters, 4 pairs of jeans, and 3 pairs of shoes. How many different outfits can Peter make using one sweater, one pair of jeans, and one pair of shoes?

- A** 13
- B** 36
- C** 72
- D** 144

28 Claire wants to find the mass of her suitcase. Which unit of measure would be **best** for her to use?

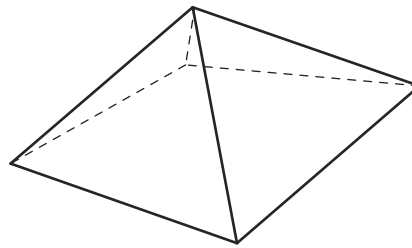
- A** tons
- B** liters
- C** meters
- D** kilograms

29 What equation represents three less than five times a number is twelve?

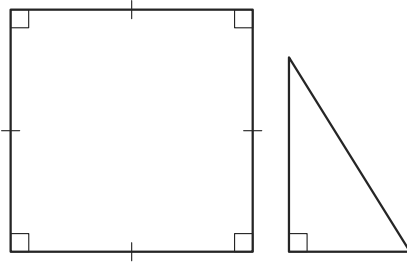
- A** $3 - 5x = 12$
- B** $5x - 3 = 12$
- C** $5(3 - x) = 12$
- D** $5(x - 3) = 12$

Go On

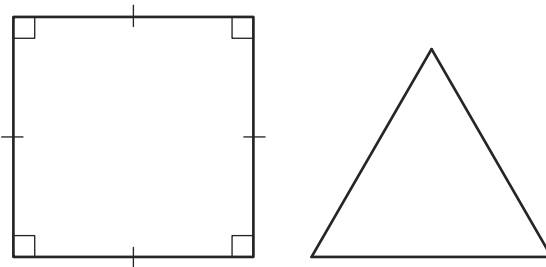
What shape makes up the base and what shape makes up the faces of the figure below?



A



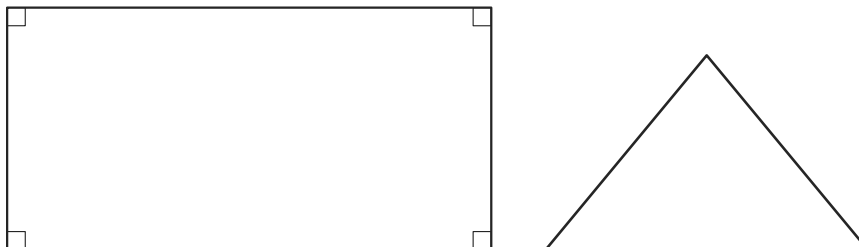
B



C



D



STOP

Erin wants to make a sandwich from the main ingredients shown in the table below.

Bread	Main Ingredient
Sourdough (S)	Peanut butter (P)
Wheat (W)	Ham (H)
Rye (R)	Turkey (T)
	Egg salad (E)

On the lines below, list all the possible ways Erin can make a sandwich using one type of bread and one main ingredient.

Go On

32

Jan buys 12 pens for \$10. Each pen costs the same amount of money. Write a proportion to find the number of pens Jan can buy for \$15. Then solve your proportion for the number of pens.

Show your work.

Answer _____ pens

33

What is the value of the expression below when $a = 2$ and $b = 6$?

$$3a^3 + 5b^2$$

Show your work.

Answer _____

34

The radius of a hydrogen atom is about 0.000000106 millimeter. Write the length of this radius in scientific notation.

Answer _____ millimeter(s)

On the lines below, explain how you determined your answer.

Go On

35

The low temperature on Sunday was -9°F . The high temperature on Sunday was 14 degrees warmer than the low temperature.

What was the high temperature on Sunday?

Answer _____ $^{\circ}\text{F}$

The low temperature on Monday was 6 degrees warmer than Sunday's low of -9°F . The low temperature on Tuesday was 3 degrees warmer than Monday's **low**. What was the **low** temperature on Tuesday?

Show your work.

Answer _____ $^{\circ}\text{F}$

36

Lewis has a bucket with a 5-gallon capacity. Lewis puts 12 pints of soapy water in the bucket to wash his car.

How many gallons of soapy water are in Lewis's bucket?

Show your work.

Answer _____ gallons

How many **more quarts** of soapy water will the bucket hold?

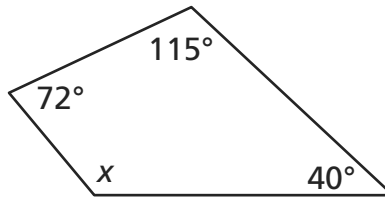
Show your work.

Answer _____ quarts

Go On

37

What is the measure of $\angle x$ in the quadrilateral below?



[not drawn to scale]

Show your work.

Answer _____ degrees

Check your answer.

Show your work.

38

Millie recorded the prices of all the plants she sold between noon and 1 P.M. at a nursery. At the end of the hour, she reviewed her list, as shown below.

\$2.95 \$8.50 \$12.95 \$3.50 \$4.50 \$14.50 \$12.95 \$4.50 \$3.50 \$12.95 \$8.50 \$4.50

Using Millie’s list, complete the frequency table below to show how many plants were sold in each of the indicated price ranges.

Be sure to

- title the table
- label the columns
- record all the data

\$0.00–\$3.99	
\$4.00–\$7.99	
\$8.00–\$11.99	
\$12.00–\$15.99	

Which price range shows the **least** number of plants sold?

Answer \$ _____ to \$ _____

STOP

2009 Mathematics Tests Standard and Performance Indicator Map with Answer Key Grade 7

Question	Type	Points	Strand	Content Performance Indicator	Answer Key
Book 1					
1	Multiple Choice	1	Number Sense and Operations	7.N01 Distinguish between the various subsets of real numbers (counting/natural numbers, whole numbers, integers, rational numbers, and irrational numbers)	A
2	Multiple Choice	1	Number Sense and Operations	7.N07 Compare numbers written in scientific notation	C
3	Multiple Choice	1	Algebra	7.A06 Evaluate formulas for given input values (surface area, rate, and density problems)	C
4	Multiple Choice	1	Statistics and Probability	7.S06 Read and interpret data represented graphically (pictograph, bar graph, histogram, line graph, double line/bar graphs or circle graph)	D
5	Multiple Choice	1	Measurement	7.M04 Convert mass within a given system	C
6	Multiple Choice	1	Geometry	7.G03 Identify the two-dimensional shapes that make up the faces and bases of three-dimensional shapes (prisms, cylinders, cones, and pyramids)	C
7	Multiple Choice	1	Statistics and Probability	7.S09 Determine the validity of sampling methods to predict outcomes	D
8	Multiple Choice	1	Number Sense and Operations	7.N06 Translate numbers from scientific notation into standard form	B
9	Multiple Choice	1	Measurement	7.M09 Determine the tool and technique to measure with an appropriate level of precision: mass	A
10	Multiple Choice	1	Number Sense and Operations	7.N12 Add, subtract, multiply, and divide integers	D
11	Multiple Choice	1	Measurement	7.M02 Convert capacities and volumes within a given system	C
12	Multiple Choice	1	Statistics and Probability	7.S08 Interpret data to provide the basis for predictions and to establish experimental probabilities	C
13	Multiple Choice	1	Algebra	7.A06 Evaluate formulas for given input values (surface area, rate, and density problems)	B

**2009 Mathematics Tests Standard and Performance Indicator Map with Answer Key
Grade 7 (continued)**

Question	Type	Points	Strand	Content Performance Indicator	Answer Key
Book 1 (continued)					
14	Multiple Choice	1	Number Sense and Operations	7.N11 Simplify expressions using order of operations (Note: Expressions may include absolute value and/or integral exponents greater than 0)	D
15	Multiple Choice	1	Statistics and Probability	7.S06 Read and interpret data represented graphically (pictograph, bar graph, histogram, line graph, double line/bar graphs or circle graph)	C
16	Multiple Choice	1	Number Sense and Operations	7.N15 Recognize and state the value of the square root of a perfect square (up to 225)	B
17	Multiple Choice	1	Geometry	6.G11 Calculate the area of basic polygons drawn on a coordinate plane (rectangles and shapes composed of rectangles having sides with integer lengths)	B
18	Multiple Choice	1	Statistics and Probability	7.S04 Calculate the range for a given set of data	C
19	Multiple Choice	1	Measurement	7.M11 Estimate surface area	B
20	Multiple Choice	1	Number Sense and Operations	7.N08 Find the common factors and greatest common factor of two or more numbers	C
21	Multiple Choice	1	Statistics and Probability	7.S12 Compare actual results to predicted results	D
22	Multiple Choice	1	Algebra	7.A01 Translate two-step verbal expressions into algebraic expressions	A
23	Multiple Choice	1	Number Sense and Operations	7.N12 Add, subtract, multiply, and divide integers	B
24	Multiple Choice	1	Measurement	7.M02 Convert capacities and volumes within a given system	D
25	Multiple Choice	1	Statistics and Probability	7.S12 Compare actual results to predicted results	A
26	Multiple Choice	1	Geometry	7.G01 Calculate the radius or diameter, given the circumference or area of a circle	C
27	Multiple Choice	1	Statistics and Probability	6.S11 Determine the number of possible outcomes for a compound event by using the fundamental counting principle and use this to determine the probabilities of events when the outcomes have equal probability	C
28	Multiple Choice	1	Measurement	7.M03 Identify customary and metric units of mass	D
29	Multiple Choice	1	Algebra	6.A03 Translate two-step verbal sentences into algebraic equations	B

**2009 Mathematics Tests Standard and Performance Indicator Map with Answer Key
Grade 7 (continued)**

Book 1 (continued)					
30	Multiple Choice	1	Geometry	7.G03 Identify the two-dimensional shapes that make up the faces and bases of three-dimensional shapes (prisms, cylinders, cones, and pyramids)	B
Book 2					
31	Short Response	2	Statistics and Probability	6.S09 List possible outcomes for compound events	n/a
32	Short Response	2	Algebra	6.A05 Solve simple proportions within context	n/a
33	Short Response	2	Algebra	6.A02 Use substitution to evaluate algebraic expressions (may include exponents of one, two and three)	n/a
34	Short Response	2	Number Sense and Operations	7.N05 Write numbers in scientific notation	n/a
35	Extended Response	3	Number Sense and Operations	7.N13 Add and subtract two integers (with and without the use of a number line)	n/a
36	Extended Response	3	Measurement	7.M02 Convert capacities and volumes within a given system	n/a
37	Extended Response	3	Geometry	7.G07 Find a missing angle when given angles of a quadrilateral	n/a
38	Extended Response	3	Statistics and Probability	6.S02 Record data in a frequency table	n/a