New York State Testing Program

Mathematics Test
Book 1

Grade **6**

March 9–13, 2009

1 Maxine is taking 5 gallons of drinking water on a camping trip. How many quarts of drinking water is Maxine taking on the camping trip?

| 1 gallon = 4 quarts |

A 4

B 5

C 20

D 40

2 The numbers below represent the ages of five of Terrell's relatives.

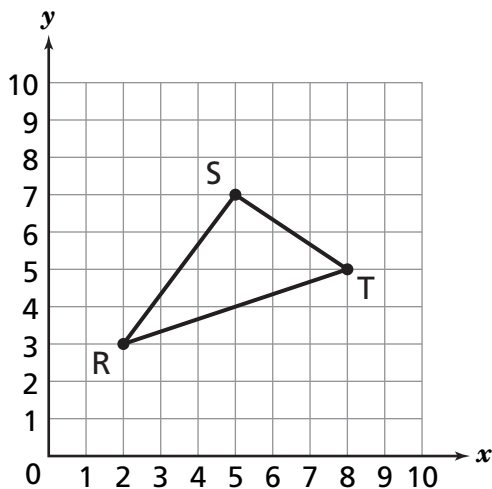56   99   60   51   99

What is the range of the ages?

A 48

B 60

C 73

D 99

Go On

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Book 1

Page 5

3 A triangle is plotted on the coordinate plane below.

Which coordinates represent, in order, the locations of point R, point S, and point T?

A   (3, 2), (7, 5), and (5, 8)

B   (2, 3), (7, 5), and (8, 5)

C   (2, 3), (5, 7), and (8, 5)

D   (3, 2), (5, 7), and (5, 8)

4 What is the expanded form of 9^3?

A 9×3

B $9 + 3$

C $9 + 9 + 9$

D $9 \times 9 \times 9$

5 David measures a side of a piece of wood. The length is 8 feet and the width is one-half of the length. What is the area, in square feet, of the piece of wood?

$$A = lw$$

A 4

B 16

C 32

D 108

6 Nora took 8 bottles of water to a picnic. Of those bottles of water, she and her friends opened a certain number of bottles, *b*. What expression can be used to determine the number of unopened bottles at the end of the picnic?

A $8 + b$

B $b + 8$

C $8 - b$

D $b - 8$

7 At a sporting goods store, $\frac{3}{10}$ of all the items are baseball items and $\frac{1}{3}$ of all the items are football items. What fraction of the total number of items in the store are baseball or football items?

A $\frac{19}{30}$

B $\frac{4}{13}$

C $\frac{4}{30}$

D $\frac{3}{13}$

Go On

8 The list below shows the number of dogs that stayed at Doggy Daycare over an eight-day period.

40, 31, 43, 43, 26, 31, 26, 43

What is the mode of these numbers?

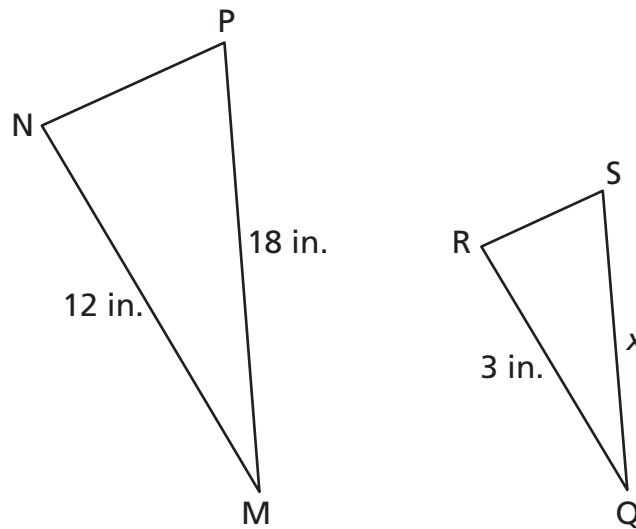**A** 40

B 43

C 26 and 31

D 31 and 43

9 Simplify the expression below.

$$3 + 5 \times 2^3 + 3^2$$

A 39

B 52

C 73

D 88

10 Triangle MNP is similar to triangle QRS.

[not drawn to scale]

What is the length of side x in triangle QRS?

A   4 inches

B   5 inches

C   4.5 inches

D   5.5 inches

11 Mr. Ramirez bought 6 tickets to the circus. He spent a total of $12.00. He used the equation below to determine the cost of each ticket, t.

$$6t = 12.00$$

How much money did Mr. Ramirez spend on each ticket?

A $72.00

B $18.00

C $6.00

D $2.00

Go On

12 What is the value of the expression below when $r = 2$?

$$9 - 3r$$

A   0

B   3

C   6

D   12

13 The table below shows the points earned by five teams in a mathematics game.

MATHEMATICS GAME

Team	Number of Points
Team A	$9\frac{1}{2}$
Team B	$8\frac{3}{4}$
Team C	$9\frac{1}{4}$
Team D	$8\frac{1}{4}$
Team E	$8\frac{1}{2}$

What is the list of the points in order from **greatest** to **least**?

A $8\frac{1}{4}$ $8\frac{1}{2}$ $8\frac{3}{4}$ $9\frac{1}{4}$ $9\frac{1}{2}$

B $9\frac{1}{2}$ $9\frac{1}{4}$ $8\frac{3}{4}$ $8\frac{1}{2}$ $8\frac{1}{4}$

C $8\frac{3}{4}$ $9\frac{1}{4}$ $8\frac{1}{4}$ $9\frac{1}{2}$ $8\frac{1}{2}$

D $9\frac{1}{2}$ $9\frac{1}{4}$ $8\frac{3}{4}$ $8\frac{1}{4}$ $8\frac{1}{2}$

---

14 A clothing store had 30 jackets. If j represents the number of jackets the store then sold, which expression can be used to determine the total number of jackets that were **not** sold?

A $30j$

B $\dfrac{30}{j}$

C $30 - j$

D $30 + j$

15 Stacy has $2\frac{1}{3}$ yards of fabric. She buys an additional $1\frac{1}{2}$ yards of fabric.

How many total yards of fabric does she have?
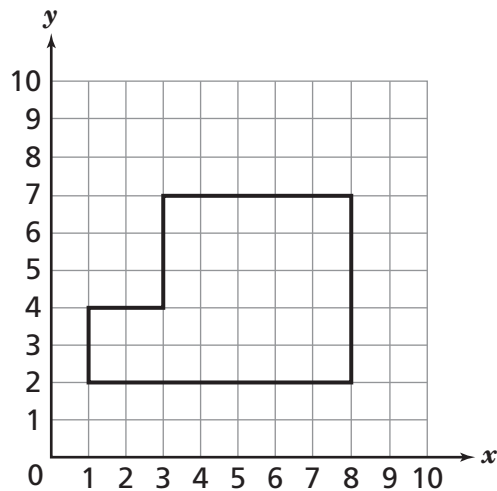
A $3\frac{1}{5}$

B $3\frac{2}{5}$

C $3\frac{1}{6}$

D $3\frac{5}{6}$

Go On

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Book 1

Page **11**

16 A diagram of a classroom floor at Hilldale Middle School is drawn on the grid below.

What is the perimeter of the classroom?

A   12 units

B   24 units

C   29 units

D   35 units

17 Olivia measures the diameter of a circle. If the diameter is 32 centimeters, what is the **radius**, in centimeters?

A   64

B   48

C   32

D   16

Page 12

18 Tyler has a container with 2.95 liters of laundry detergent. How many milliliters of detergent are in the container?

$$1 \text{ liter} = 1{,}000 \text{ milliliters}$$

A 0.295

B 29.5

C 295

D 2,950

19 What number is equivalent to $|-27|$?

A 27

B −27

C $\dfrac{1}{27}$

D $-\dfrac{1}{27}$

Go On

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Book 1

Page 13

20 The bar graph below shows the number of seniors who graduated over a four-year period from Empire High School.

GRADUATING SENIORS
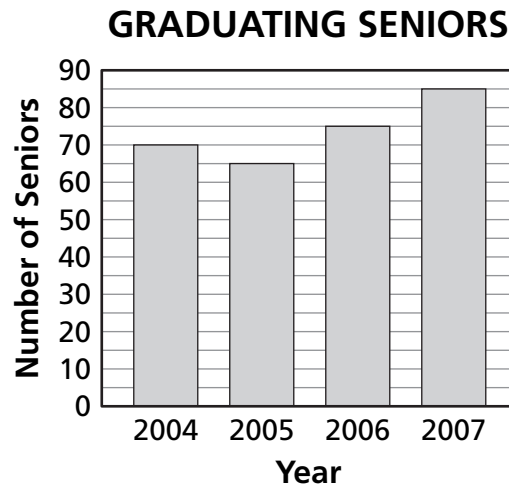
What is the total number of seniors who graduated over the four-year period?

A 280

B 285

C 290

D 295

21 Lani has learned 21 of the 84 songs in her piano playbook. What percent of the total number of songs in the playbook has Lani learned?

A 75%

B 63%

C 25%

D 21%

22 The dogs in an animal parade are grouped by size. There are 12 small dogs, 8 medium-sized dogs, and 13 large dogs. If one dog is randomly chosen to lead the parade, what is the probability that a large dog will be chosen?
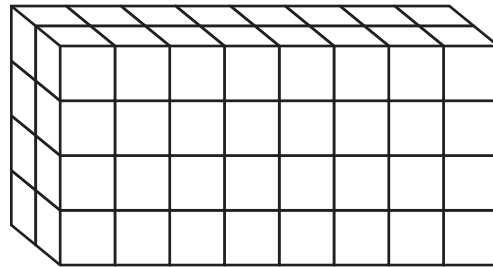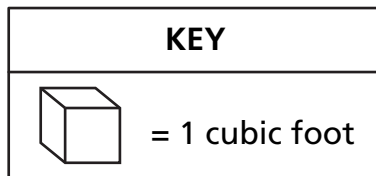
A $\frac{1}{3}$

B $\frac{1}{33}$

C $\frac{13}{20}$

D $\frac{13}{33}$

23 What is the volume of the rectangular prism shown below?

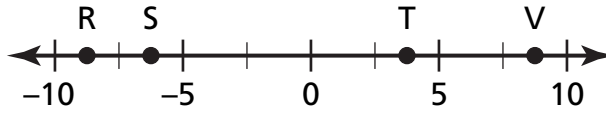| KEY |
| --- |
| = 1 cubic foot |

A   16 cubic feet

B   32 cubic feet

C   56 cubic feet

D   64 cubic feet

Go On

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Book 1

Page 15

24 Which point on the number line below represents a number that is less than −2.5 but greater than −7.5?

A   point R

B   point S

C   point T

D   point V

25 Lin is making a volcano for a science fair. He uses 8 cups of vinegar. How many pints of vinegar does Lin use?

1 pint = 2 cups

A   4

B   6

C   10

D   16

STOP

Book 1

New York State Testing Program

Mathematics Test
Book 2

Grade **6**

March 9–13, 2009

Name _____

26 Ms. Elma writes the expression below.

$$3 \times 3 \times 3 \times 3 \times 3 \times 3$$

She asks her sixth-grade students to rewrite the expression in exponential form. Marjorie writes the expression below.

$$6^3$$

On the lines below, explain why Marjorie's answer is incorrect.

Be sure to correctly rewrite Ms. Elma's expression in exponential form.

_____

_____

_____

_____

Go On

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Book 2

Page 3

27 The points N, R, and P are on the circle below. Point M is the center of the circle. Connect three points to form a central angle.
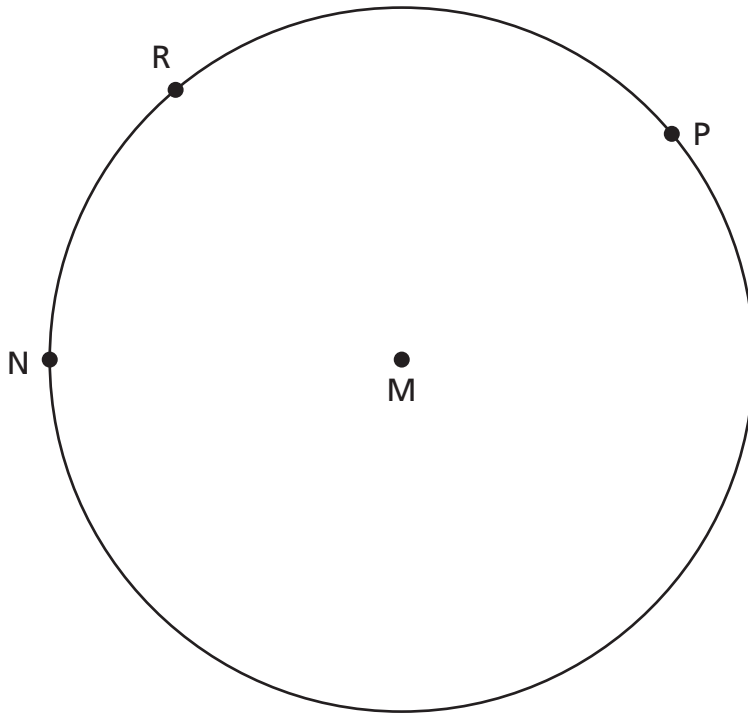
On the lines below, explain how you determined the three points that form a central angle.

_____

_____

_____

_____

_____

28 Jenny picked 25 roses. She gave away 10 roses. What percent of the roses did Jenny give away?

Show your work.

Answer _____ %

29 What is the value of the expression $6m + 3^3$ when *m* equals 7?

Show your work.

Answer _____

Go On

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Book 2

Page 5

30 Cruz has collected some marbles. The colors of the marbles are listed below.

- 8 red marbles
- 2 blue marbles
- 7 yellow marbles
- 3 green marbles

Cruz mixes all the marbles in a bag and then turns the bag upside-down so that only one marble falls out at a time. What is the probability that the **first** marble to fall out will be a blue marble?
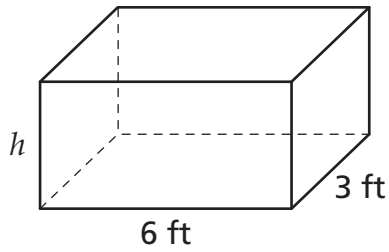
Answer _____

What is the probability that the **first** marble to fall out will be red, yellow, or green?

Show your work.

Answer _____

Book 2

31 A shipping company uses large crates to ship certain items. A diagram of one of the crates is shown below.

[not drawn to scale]

$$V = lwh$$

The volume of the crate is 72 cubic feet. What is the height, in feet, of the crate?

Show your work.

Answer _____ feet

Go On

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Book 2

Page 7

32 Complete the equation below to demonstrate the commutative property of addition.

$$2 + 3 = \underline{\hspace{1cm}} + \underline{\hspace{1cm}}$$

On the lines below, explain how the completed equation demonstrates the commutative property of addition.

_____

_____

_____

_____

_____

Rewrite the expression below to demonstrate the associative property of multiplication.

$$2 \times (3 \times 5)$$

Answer _____

33 Mr. Roberts is going shopping. He has a budget of $150.00. He will buy **either** a painting **or** a lamp.

If he spends 80% of his money on a painting, how much money will Mr. Roberts spend?

Show your work.

Answer $ _____

If he spends 50% of his money on a lamp, instead of buying a painting, how much money will Mr. Roberts spend?

Answer $ _____

Go On

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Book 2

Page 9

34 Rudy is building a wall beside his garden. He records the height of the wall at the end of each day during an 11-day period. His data is shown in the line graph below.

WALL HEIGHT
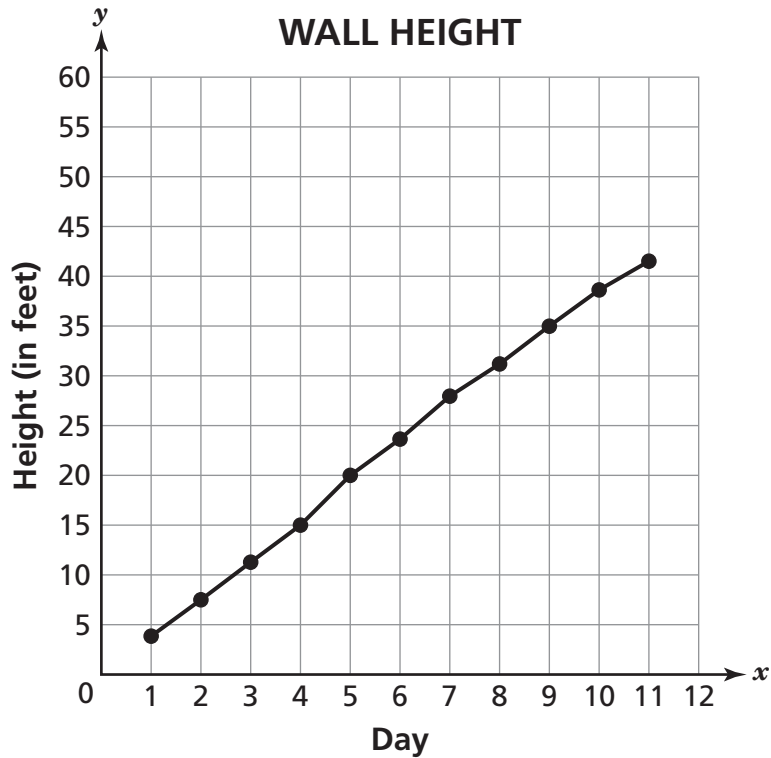
According to the data in the graph, what was the height of the wall at the end of Day 4?

Answer _____ feet

Based on the data in the graph, predict the height of the wall at the end of Day 12.

Prediction _____ feet

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

_____

_____

_____

_____

Go On

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Book 2

Page 11

35 Donnie is autographing baseball items.

He has a total of 320 baseball cards to sign. He has signed 14 cards so far. The equation below can be used to determine the number of baseball cards, *c*, Donnie still needs to sign.

$$14 + c = 320$$

What is the number of baseball cards Donnie still needs to sign?

Show your work.

Answer _____ baseball cards

He also signs 300 baseballs, which are stored in 15 boxes. Donnie uses the equation below to determine the number of baseballs, *b*, in each box.

$$15b = 300$$

How many baseballs are in each box?

Answer _____ baseballs

STOP

2009 Mathematics Test Standard and Performance Indicator Map with Answer Key
Grade 6

Question	Type	Points	Strand	Content Performance Indicator	Answer Key
Book 1					
1	Multiple Choice	1	Measurement	6.M03 Identify equivalent customary units of capacity (cups to pints, pints to quarts, and quarts to gallons)	C
2	Multiple Choice	1	Statistics and Probability	6.S06 Determine the range for a given set of data	A
3	Multiple Choice	1	Geometry	5.G13 Plot points to form basic geometric shapes (identify and classify)	C
4	Multiple Choice	1	Number Sense and Operations	6.N24 Represent exponential form as repeated multiplication	D
5	Multiple Choice	1	Algebra	6.A06 Evaluate formulas for given input values (circumference, area, volume, distance, temperature, interest, etc.)	C
6	Multiple Choice	1	Algebra	5.A02 Translate simple verbal expressions into algebraic expressions	C
7	Multiple Choice	1	Number Sense and Operations	6.N16 Add and subtract fractions with unlike denominators	A
8	Multiple Choice	1	Statistics and Probability	6.S05 Determine the mean, mode and median for a given set of data	B
9	Multiple Choice	1	Number Sense and Operations	6.N22 Evaluate numerical expressions using order of operations (may include exponents of two and three)	B
10	Multiple Choice	1	Geometry	6.G01 Calculate the length of corresponding sides of similar triangles, using proportional reasoning	C
11	Multiple Choice	1	Algebra	5.A04 Solve simple one-step equations using basic whole-number facts	D
12	Multiple Choice	1	Algebra	5.A03 Substitute assigned values into variable expressions and evaluate using order of operations	B
13	Multiple Choice	1	Number Sense and Operations	6.N15 Order rational numbers (including positive and negative)	B
14	Multiple Choice	1	Algebra	5.A02 Translate simple verbal expressions into algebraic expressions	C
15	Multiple Choice	1	Number Sense and Operations	6.N18 Add, subtract, multiply, and divide mixed numbers with unlike denominators	D

2009 Mathematics Test Standard and Performance Indicator Map with Answer Key
Grade 6 (continued)

Question	Type	Points	Strand	Content Performance Indicator	Answer Key
Book 1 (continued)					
16	Multiple Choice	1	Geometry	5.G14 Calculate perimeter of basic geometric shapes drawn on a coordinate plane (rectangles and shapes composed of rectangles having sides with integer lengths and parallel to the axes)	B
17	Multiple Choice	1	Geometry	6.G06 Understand the relationship between the diameter and radius of a circle	D
18	Multiple Choice	1	Measurement	6.M05 Identify equivalent metric units of capacity (milliliter to liter and liter to milliliter)	D
19	Multiple Choice	1	Number Sense and Operations	6.N13 Define absolute value and determine the absolute value of rational numbers (including positive and negative)	A
20	Multiple Choice	1	Statistics and Probability	6.S07 Read and interpret graphs	D
21	Multiple Choice	1	Number Sense and Operations	6.N11 Read, write, and identify percents of a whole (0% to 100%)	C
22	Multiple Choice	1	Statistics and Probability	5.S07 Create a sample space and determine the probability of a single event, given a simple experiment (e.g., rolling a number cube)	D
23	Multiple Choice	1	Geometry	6.G04 Determine the volume of rectangular prisms by counting cubes and develop the formula	D
24	Multiple Choice	1	Number Sense and Operations	6.N14 Locate rational numbers on a number line (including positive and negative)	B
25	Multiple Choice	1	Measurement	6.M03 Identify equivalent customary units of capacity (cups to pints, pints to quarts, and quarts to gallons)	A
Book 2					
26	Short Response	2	Number Sense and Operations	6.N23 Represent repeated multiplication in exponential form	n/a
27	Short Response	2	Geometry	6.G05 Identify radius, diameter, chords and central angles of a circle	n/a
28	Short Response	2	Number Sense and Operations	6.N21 Find multiple representations of rational numbers (fractions, decimals, and percents 0 to 100)	n/a
29	Short Response	2	Algebra	6.A02 Use substitution to evaluate algebraic expressions (may include exponents of one, two and three)	n/a

Question	Type	Points	Strand	Content Performance Indicator	Answer Key
Book 2 (continued)					
30	Short Response	2	Statistics and Probability	5.S07 Create a sample space and determine the probability of a single event, given a simple experiment (e.g., rolling a number cube)	n/a
31	Short Response	2	Measurement	6.M01 Measure capacity and calculate volume of a rectangular prism	n/a
32	Extended Response	3	Number Sense and Operations	6.N02 Define and identify the commutative and associative properties of addition and multiplication	n/a
33	Extended Response	3	Number Sense and Operations	6.N12 Solve percent problems involving percent, rate, and base	n/a
34	Extended Response	3	Statistics and Probability	6.S08 Justify predictions made from data	n/a
35	Extended Response	3	Algebra	5.A05 Solve and explain simple one-step equations using inverse operations involving whole numbers	n/a