New York State Testing Program

Mathematics Test
Book 1

Grade **7**

May 5–7, 2010

1 Which measure is equivalent to 1.5 kilograms?

1 kilogram = 1,000 grams

A   15 grams

B   150 grams

C   1,500 grams

D   15,000 grams

2 At noon on Monday in Minneapolis, the temperature, in degrees Fahrenheit (F), was −4°F. At noon on Tuesday, the temperature was 6 degrees higher. What was the temperature at noon on Tuesday?

A   2°F

B   −2°F

C   10°F

D   −10°F

3 The prices of plasma televisions at an electronics store are shown below.

$1,544 $1,242 $2,285 $1,116 $1,899 $1,649 $1,423 $1,242

What is the range of the prices of these plasma televisions?

A $1,043

B $1,169

C $1,242

D $1,484

Go On

■ SECURE MATERIAL ■
Do not reproduce. Do not discuss contents
until end of designated makeup schedule.

Book 1

Page 5

4 Which expression is a binomial?

A p^2

B $3w$

C $3w + 1$

D $3p^2 + 2p + 2$

5 A box contains 6 red pens and 4 blue pens. Cory randomly picks a pen from the box and keeps it. Then Todd randomly picks a pen from the box. What is the probability both boys will pick red pens?

A $\dfrac{1}{3}$

B $\dfrac{9}{25}$

C $\dfrac{1}{30}$

D $\dfrac{1}{36}$

6 Simplify the expression below.

$$-4x - (-x)$$

A $5x$

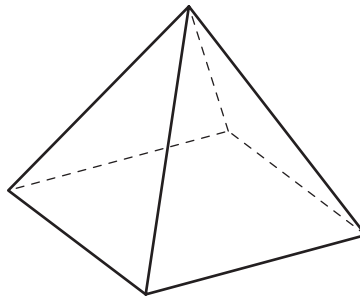**B** $3x$

C $-3x$

D $-5x$

7 What is the value of the expression?

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

A 7

B 12

C 15

D 29

8 A rectangular pyramid is shown below.

Which shape could be the base of the pyramid?

A square

B pentagon

C triangle

D trapezoid

Go On

9 Gary and Thomas are playing a game with number cards. At the end of the game, Thomas still has 5 cards. If the value of each card is –50 points, how many points does Thomas have?

A   –250

B   –10

C   10

D   250

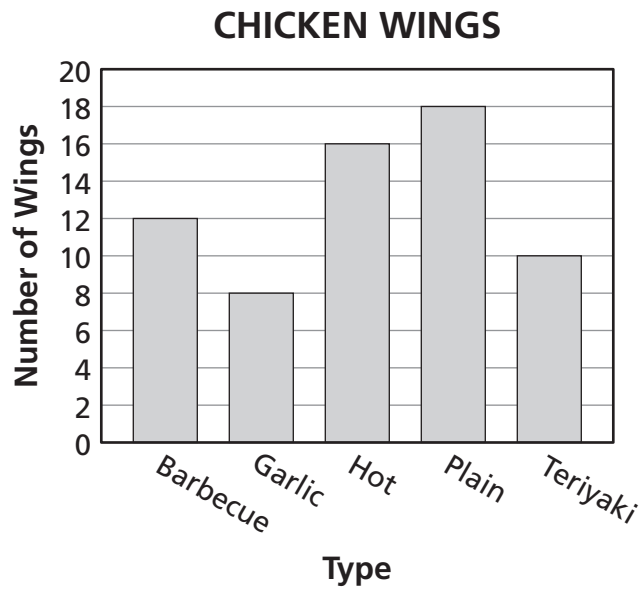**10** Find the value of *a* in the equation below.

$$3a + 2 = a - 6$$

A   4

B   2

C   –2

D   –4

11 Mr. Wilt prepares some chicken wings for a picnic. The bar graph below shows the number of different types of wings he prepares.

CHICKEN WINGS

Based on the bar graph, which of these statements is true?

A Mr. Wilt prepares 2 more plain wings than hot wings.

B Mr. Wilt prepares twice as many plain wings as hot wings.

C Mr. Wilt prepares 2 more barbecue wings than garlic wings.

D Mr. Wilt prepares twice as many barbecue wings as garlic wings.

12 Derek has 12 shirts in his closet. If 2 out of every 3 of these shirts are striped, how many striped shirts does Derek have in his closet?

A 2

B 8

C 11

D 18

Go On

■ **SECURE MATERIAL** ■
Do not reproduce. Do not discuss contents
until end of designated makeup schedule.

Book 1

Page 9

13 Which of these is a unit of measure for the mass of a bag of apples?
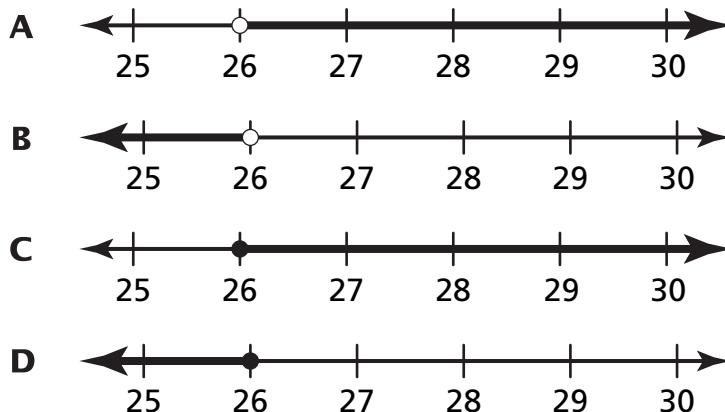
    A   kilogram

    B   kilometer

    C   cubic inches

    D   square inches

14 Joan flipped a coin 100 times during a mathematics experiment. The coin landed on tails 36 times. Based on Joan's results, which of these statements is true?

    A   The coin landed on tails more than expected.

    B   The coin landed on heads less than expected.

    C   The coin landed on heads more than tails.

    D   The coin landed on heads less than tails.

15 Which graph represents the solution set of the inequality below?

$$x > 26$$

A

25   26   27   28   29   30

B

25   26   27   28   29   30

C

25   26   27   28   29   30

D

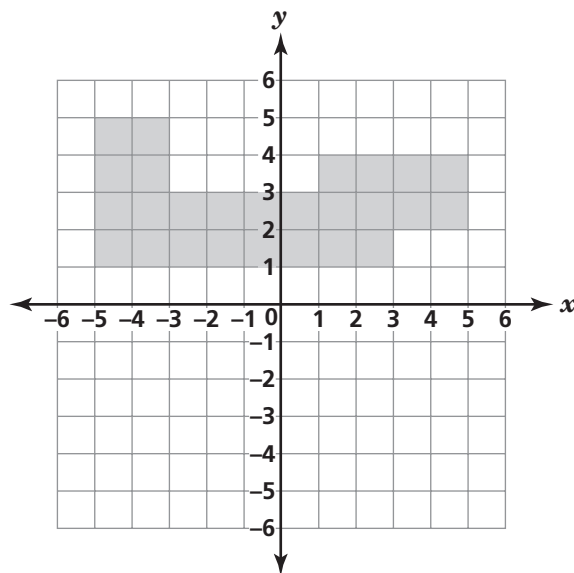25   26   27   28   29   30

Book 1

16   Helen is preparing candy bags for the children at a party. She has 2 flavors of lollipops, 4 types of candy bars, and 6 flavors of chewy candies. If each bag contains 1 piece of each kind of candy, what is the total number of possible candy combinations for the bags?

A   12

B   15

C   36

D   48

17   What is the area, in square units, of the shaded region on the coordinate plane below?

A   26

B   28

C   30

D   32

Go On

■ SECURE MATERIAL ■
Do not reproduce. Do not discuss contents
until end of designated makeup schedule.

Book 1

Page 11

18 Mario walks his dog once every 8 days in the park, while Todd walks his dog once every 14 days. Today, both Mario and Todd walked their dogs in the park. In how many more days will both boys walk their dogs in the park on the same day?

A 2 days

B 22 days

C 56 days

D 112 days

19 Randy spins the arrow on a spinner with 5 equal sections labeled A, B, C, D, and E. Then, he rolls a 6-sided number cube with sides numbered 1 through 6. What is the probability that the arrow will stop on the letter A and the number cube will show the number 4?

A $\frac{1}{30}$

B $\frac{1}{11}$

C $\frac{1}{6}$

D $\frac{1}{5}$

20 What is the value of *n* in the equation below?

$$2n + 1 = 21$$

A 10

B 11

C 18

D 20

21 Based on Rudy's baseball statistics, the probability that he will pitch a curveball is $\frac{1}{4}$. If Rudy throws 20 pitches, how many pitches **most likely** will be curveballs?

A 1

B 2

C 5

D 10

Go On

■ SECURE MATERIAL ■
Do not reproduce. Do not discuss contents
until end of designated makeup schedule.

Book 1

Page 13

22 Jessie performs an experiment by spinning the arrow on a spinner. The spinner has four equal sections. The results of his experiment are shown in the table below.

JESSIE'S SPINNER EXPERIMENT

Outcome	Frequency
Blue	11
Green	11
Orange	12
Red	8

Based on the data in the table, what is the **experimental** probability that the arrow will land on red?

A $\dfrac{1}{8}$

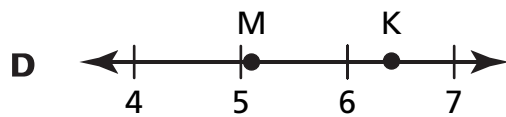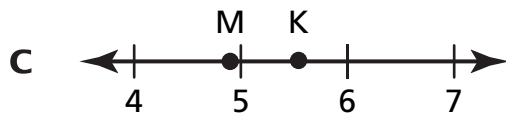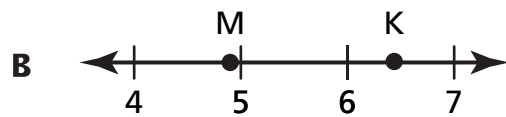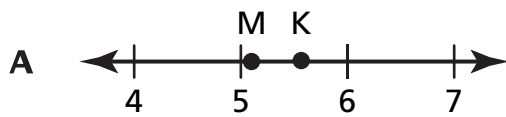B $\dfrac{8}{42}$

C $\dfrac{8}{34}$

D $\dfrac{1}{4}$

23 A scientist discovers a dinosaur bone that is 7×10^7 years old. What is this number in standard form?

A 7,000,000

B 7,100,000

C 70,000,000

D 71,000,000

24 What is the greatest common factor (GCF) of 64 and 84?

A   2

B   4

C   6

D   8

25 If $K = \sqrt{31}$ and $M = \sqrt{26}$, which graph **most closely** represents the locations of K and M on a number line?

A

```
        M  K
   ←──┼──┼──┼──┼──┼──→
     4  5  6  7
```

B

```
        M        K
   ←──┼──┼──┼──┼──┼──→
     4  5  6  7
```

C

```
        M   K
   ←──┼──┼──┼──┼──┼──→
     4  5  6  7
```

D

```
        M      K
   ←──┼──┼──┼──┼──┼──→
     4  5  6  7
```

Go On

■ **SECURE MATERIAL** ■
Do not reproduce. Do not discuss contents
until end of designated makeup schedule.

Book 1

Page 15

26 Jeffrey wants to measure the mass of his fish tank. Which tool is **best** for him to use?

    A   ruler

    B   scale

    C   tape measure

    D   measuring cup

27 Which number is the square root of 196?

    A   12

    B   14

    C   16

    D   18

28 The square root of a number is between 8 and 9. Which of these could be that number?

    A   17

    B   63

    C   71

    D   89

29 Which list of numbers below is a set of irrational numbers **only**?

A $\left\{ \sqrt{5}, \sqrt{21} \right\}$

B $\left\{ \dfrac{3}{5}, \dfrac{\sqrt{21}}{3}, \dfrac{1}{3} \right\}$

C $\left\{ \dfrac{3}{5}, \dfrac{\sqrt{21}}{3}, \sqrt{9}, \dfrac{1}{3} \right\}$

D $\left\{ \sqrt{5}, \dfrac{\sqrt{21}}{3}, \sqrt{9}, \sqrt{21} \right\}$

30 Brandon wants to conduct a survey as to whether mushrooms should be added to the pizzas sold in the school cafeteria. Which sampling method will offer Brandon the **best** results?

A interview every vegetarian student

B interview every student at a pizza parlor

C interview every student who brings lunch from home

D interview every student who eats lunch in the cafeteria

STOP

New York State Testing Program

Mathematics Test
Book 2

Grade 7

May 5–7, 2010

Name _____

31 To raise money for charity, Polly climbs the 1,776 steps in the CN Tower in Toronto, Canada. If it takes her 40 minutes to complete the climb, what is Polly's average rate in steps per minute?

$$\text{Rate} = \frac{\text{Distance}}{\text{Time}}$$

Show your work.

Answer _____ steps per minute

Go On

■ **SECURE MATERIAL** ■
Do not reproduce. Do not discuss contents
until end of designated makeup schedule.

Book 2

Page 3

32 Is the figure below a right triangle? On the lines below, explain how you determined your answer.

[not drawn to scale]

_____

_____

_____

_____

_____
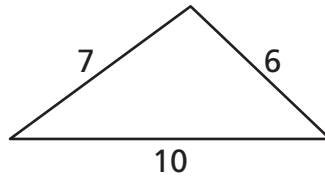
33 For the lunch special at Nick's Deli, customers can create their own sandwich by selecting 1 type of bread and 1 type of meat from the selection below.

SANDWICH CHOICES

Type of Bread	Type of Meat
White	Chicken
Rye	Roast Beef

In the space below, list all the possible sandwich combinations using 1 type of bread and 1 type of meat.

If Nick decides to add whole wheat bread as another bread option, how many possible sandwich combinations will there be?

Answer _____ sandwich combinations

Go On

■ **SECURE MATERIAL** ■
Do not reproduce. Do not discuss contents
until end of designated makeup schedule.

Book 2

Page 5

34 Use your protractor to help you solve this problem.

Sara is sharing apples from her apple tree with her friends. She wants to create a circle graph to show the amount of apples given to each friend. The table below shows the percent of apples each friend receives and the angle measure for each sector of the circle graph.
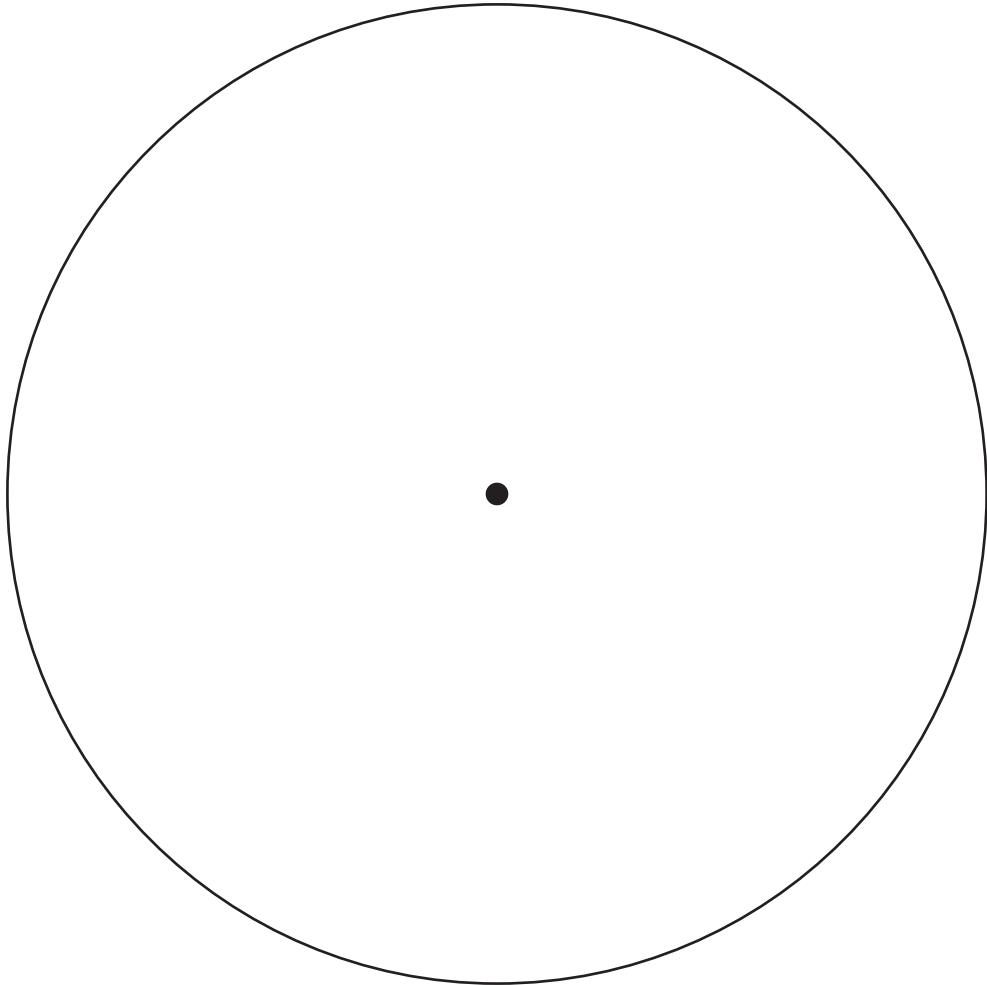
Friend	Percent of Apples	Angle Measure (in degrees)
Lori	5%	18°
Donovan	35%	126°
Melinda	20%	72°
Avery	40%	144°

Complete the circle graph below to show the data in the table.

Be sure to

- graph all the data
- label each sector

SARA'S APPLES

Go On

■ **SECURE MATERIAL** ■
Do not reproduce. Do not discuss contents
until end of designated makeup schedule.

Book 2

Page 7

35 Melissa conducts a study of the heights of some red kangaroos. She records the heights in the table below.

Red Kangaroo Heights (inches)
40 57 72 78 62 67 73 66 71 60 56 52 48 51 44 79

Using the data in Melissa's table, complete the frequency table below to show the number of kangaroos in each of the indicated height ranges.

RED KANGAROO HEIGHTS

Height (inches)	Number of Kangaroos
40–49	
50–59	
60–69	
70–79	

Based on her study, Melissa claims that exactly $\frac{1}{4}$ of the red kangaroos are between 70 and 79 inches in height. On the lines below, explain whether her claim is correct.

_____

_____

_____

_____

_____

36   Jerry plans to build a deck that is 189 square feet. What is the prime factorization of 189? Write your answer in exponential form.

Show your work.

Answer _____

Jerry wants his deck to be more than 6 feet wide. Using your result from above, write two possible sets of dimensions for Jerry's deck.

Answer 1. _____ feet by _____ feet

   2. _____ feet by _____ feet

Go On

■ **SECURE MATERIAL** ■
Do not reproduce. Do not discuss contents
until end of designated makeup schedule.

Book 2

Page 9

37 The city is building a new 1,815-meter long bicycle trail through the park. Two construction companies have submitted the proposals below for how many days it will take them to complete the job.

ARCUS CONSTRUCTION

Length of Trail: 1,815 meters
Number of meters they will build per day: 48

Number of days to complete the job:

1,815 ÷ 48 = **37.8**

JENNINGS CONSTRUCTION

Length of Trail: 1,815 meters
Number of meters they will build per day: 96

Number of days to complete the job:

1,815 ÷ 96 = **189.1**

One of the construction companies has made an error in calculation. Use **estimation** to find the number of days it will take each construction company to finish the job.

Show your work.

Estimation for Arcus Construction _____ days

Estimation for Jennings Construction _____ days

Based on your estimations, explain the error in calculation one of the companies made. Be sure to name the company.

_____

_____

_____

_____

_____

Go On

■ SECURE MATERIAL ■
Do not reproduce. Do not discuss contents
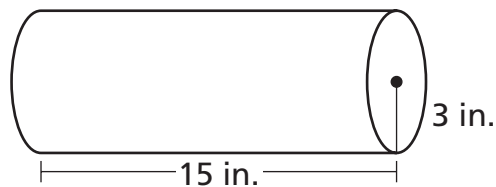until end of designated makeup schedule.

Book 2

Page 11

38   The diagram below shows a pillow Chris wants to cover with fabric.

[not drawn to scale]

What is the **total** surface area of the pillow? Round your answer to the nearest hundredth.

Show your work.

Answer _____ square inches

If Chris shortens the length of the pillow from 15 inches to 12 inches, how much **less** fabric will she need? Round your answer to the nearest hundredth.

Show your work.

Answer _____ square inches

STOP

2010 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	Measurement	7.M04 Convert mass within a given system	C
2	Multiple Choice	1	Number Sense and Operations	7.N13 Add and subtract two integers (with and without the use of a number line)	A
3	Multiple Choice	1	Statistics and Probability	7.S04 Calculate the range for a given set of data	B
4	Multiple Choice	1	Algebra	7.A03 Identify a polynomial as an algebraic expression containing one or more terms	C
5	Multiple Choice	1	Statistics and Probability	6.S10 Determine the probability of dependent events	A
6	Multiple Choice	1	Algebra	7.A02 Add and subtract monomials with exponents of one	C
7	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.*	C
8	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)	A
9	Multiple Choice	1	Number Sense and Operations	7.N12 Add, subtract, multiply, and divide integers	A
10	Multiple Choice	1	Algebra	7.A04 Solve multi-step equations by combining like terms, using the distributive property, or moving variables to one side of the equation	D
11	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)	A
12	Multiple Choice	1	Algebra	6.A05 Solve simple proportions within context	B
13	Multiple Choice	1	Measurement	7.M03 Identify customary and metric units of mass	A
14	Multiple Choice	1	Statistics and Probability	7.S12 Compare actual results to predicted results	C
15	Multiple Choice	1	Geometry	7.G10 Graph the solution set of an inequality (positive coefficients only) on a number line	A

Question	Type	Points	Strand	Content Performance Indicator	Answer Key
Book 1 (continued)					
16	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	D
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)	A
18	Multiple Choice	1	Number Sense and Operations	7.N09 Determine multiples and least common multiple of two or more numbers	C
19	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	A
20	Multiple Choice	1	Algebra	6.A04 Solve and explain two-step equations involving whole numbers using inverse operations	A
21	Multiple Choice	1	Statistics and Probability	7.S10 Predict the outcome of an experiment	C
22	Multiple Choice	1	Statistics and Probability	7.S08 Interpret data to provide the basis for predictions and to establish experimental probabilities	B
23	Multiple Choice	1	Number Sense and Operations	7.N06 Translate numbers from scientific notation into standard form	C
24	Multiple Choice	1	Number Sense and Operations	7.N08 Find the common factors and greatest common factor of two or more numbers	B
25	Multiple Choice	1	Number Sense and Operations	7.N03 Place rational and irrational numbers (approximations) on a number line and justify the placement of the numbers	A
26	Multiple Choice	1	Measurement	7.M09 Determine the tool and technique to measure with an appropriate level of precision: mass	B
27	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
28	Multiple Choice	1	Number Sense and Operations	7.N18 Identify the two consecutive whole numbers between which the square root of a non-perfect square whole number less than 225 lies (with and without the use of a number line)	C

Question	Type	Points	Strand	Content Performance Indicator	Answer Key
Book 1 (continued)					
29	Multiple Choice	1	Number Sense and Operations	7.N02 Recognize the difference between rational and irrational numbers (e.g., explore different approximations of π)	A
30	Multiple Choice	1	Statistics and Probability	7.S09 Determine the validity of sampling methods to predict outcomes	D
Book 2					
31	Short Response	2	Algebra	7.A06 Evaluate formulas for given input values (surface area, rate, and density problems)	n/a
32	Short Response	2	Geometry	7.G09 Determine whether a given triangle is a right triangle by applying the Pythagorean Theorem and using a calculator	n/a
33	Short Response	2	Statistics and Probability	6.S09 List possible outcomes for compound events	n/a
34	Short Response	2	Measurement	7.M08 Draw central angles in a given circle using a protractor (circle graphs)	n/a
35	Extended Response	3	Statistics and Probability	6.S02 Record data in a frequency table	n/a
36	Extended Response	3	Number Sense and Operations	7.N10 Determine the prime factorization of a given number and write in exponential form	n/a
37	Extended Response	3	Number Sense and Operations	7.N19 Justify the reasonableness of answers using estimation	n/a
38	Extended Response	3	Geometry	7.G04 Determine the surface area of prisms and cylinders, using a calculator and a variety of methods	n/a