Name _____

Grade 7

Form S

S

North Carolina

End-of-Grade Tests–Grade 7

Mathematics—Calculator Active

Mathematics—Calculator Inactive (page 15)

Public Schools of North Carolina
www.ncpublicschools.org
State Board of Education
Department of Public Instruction
Division of Accountability Services/North Carolina Testing Program
Raleigh, North Carolina 27699-6314

1.   Claudia bought a television at a
     25% discount. The original price of
     the television was $349. There was a
     7% sales tax. How much did she pay
     for the television, including tax?

     A $87.25

     B $92.45

     C $243.43

     D $280.07

2.   On a map, the distance between

     two towns is $4\frac{3}{4}$ inches. The actual

     distance between the towns is

     380 miles. What is the scale of the

     map?

     A   1 inch = 60 miles

     B   1 inch = 70 miles

     C   1 inch = 80 miles

     D   1 inch = 90 miles

3.   A cylinder has a height of 1 foot and a
     radius of 2 feet.
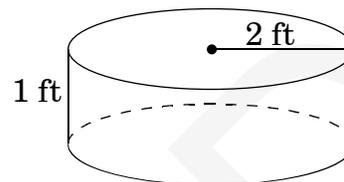
     What is the **approximate** surface
     area?

     A   113 square feet

     B   50 square feet

     C   38 square feet

     D   13 square feet

4. Which triangle is similar to the shaded triangle?

2 | 4

A

1 | 2

B

3 | 4

C

3 | 8

D

4 | 6
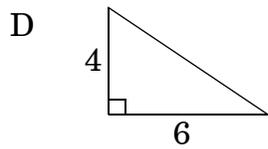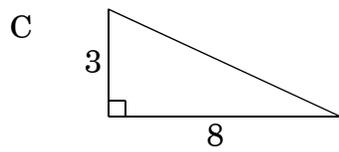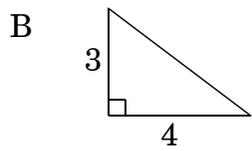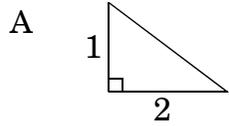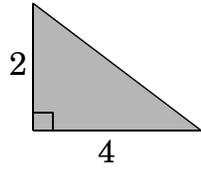
5.
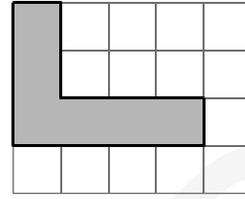
Which hexagon shown below is similar to the shaded hexagon shown above?

A

B

C

D

Go to next page

NCDPI

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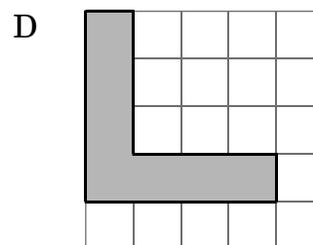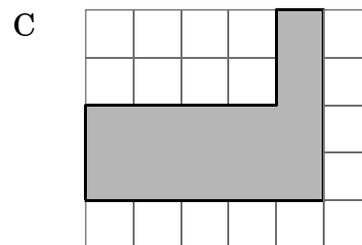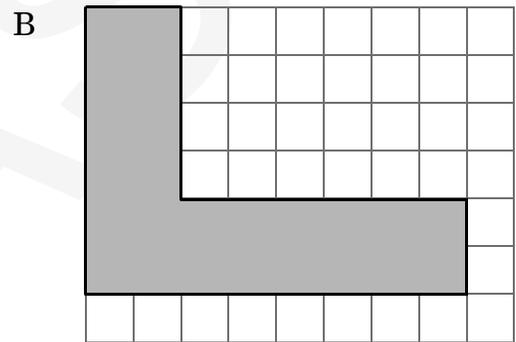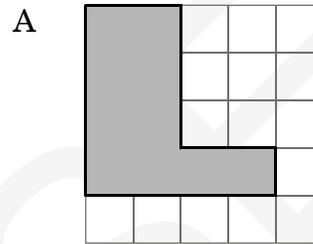
6. A regular pentagon has sides 6.2 inches long. It is similar to a pentagon whose sides are three times as large. What is the perimeter of the larger pentagon?

   A   7.1 in.

   B   10.3 in.

   C   31 in.

   D   93 in.

7. A 4" × 6" photograph needs to be enlarged to 10" × 15" to fit into an existing frame. What is the ratio of the dimensions of the original photograph to the corresponding dimensions of the enlarged photograph?

   A   2 : 5

   B   2 : 3

   C   4 : 15

   D   3 : 5

8. Rectangular cake pans X and Y are similar. The ratio of the width of pan X to the width of pan Y is 3 : 4. The length of pan X is 10 inches, and its width is 5 inches. What is the perimeter of pan Y?

   A   11 inches

   B   20 inches

   C   22 inches

   D   40 inches

9.   The double bar graph below displays students' favorite subjects in September and June.

Students' Favorite Subject
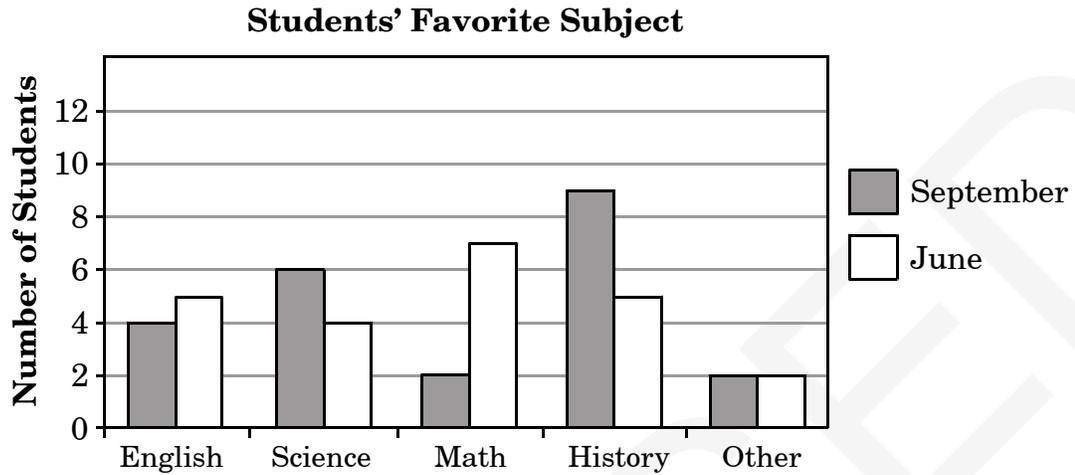
Which statement below is true?

A   From the survey, Science was more popular in September than in June.

B   Three subjects were less popular in September than in June.

C   The mode in September was Math.

D   There were 25 students who were surveyed.

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10.   Mr. Benson surveyed his class of 30 students to determine their favorite dog breed. The results were graphed using a bar graph. The longest bar was for Labrador retrievers. What statistic does this bar represent for the survey data?

A   mode

B   mean

C   median

D   range

11. According to this box-and-whisker plot, what percent of students study less than 16 hours per week?

Hours Students Studied per Week
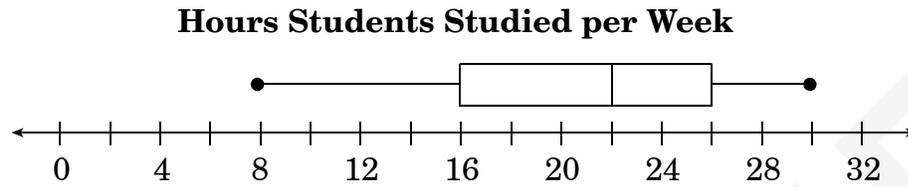
A   50%

B   25%

C   16%

D   6%

12. When making a box-and-whisker plot of the following set of data, what does the number 303 represent?

305, 299, 286, 305, 311, 302, 307, 300, 303

A   the lower quartile of the set of data

B   the upper quartile of the set of data

C   the interquartile range of the set of data

D   the median of the set of data

13. In gymnastics, each athlete receives 6 scores. The highest and lowest scores do not count, and the final score is determined by the mean of the remaining scores. After a balance beam performance, a gymnast receives the following scores:

9.8, 9.9, 9.8, 9.7, 9.5, 9.6

What is the gymnast's final score?

A   9.8

B   9.75

C   9.725

D   9.717

14. An electrician charges a service fee of $65 to come to a home plus an hourly rate of $42. He works $3\frac{1}{2}$ hours. How much is the bill?

A $269.50

B $212.00

C $147.00

D $107.00

15. The students in a science class observed that if they divided the number of chirps a cricket makes per minute (n) by 4 and added 37, the result was the temperature in degrees Fahrenheit (°F). Using this formula, what is the temperature in degrees Fahrenheit if the cricket chirps 32 times in 1 minute?

A   37°F

B   40°F

C   45°F

D   50°F

16. Which values for e, f, and g will make the three points lie on the same line?

$(3, e)$, $(f, 5)$, $(5, g)$

A $e = 2, f = 2, g = 2$

B $e = 8, f = 3, g = 0$

C $e = 4, f = 4, g = 6$

D $e = 3, f = 5, g = 0$

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17. A store makes a profit of $14.76 on each belt it sells. The company will also give each store $50.00 for carrying its product. If the store wants to make at ***least*** $475.00 on the belts, what is the ***fewest*** number of belts it will have to sell?

A   28

B   29

C   32

D   33

18. Which equation represents the word sentence below?

Two less than the sum of a number and six is equal to the product of the number and three.

A $2 + x - 6 = 3x$

B $6x - 2 = 3x$

C $2 - 6x = 3x$

D $x + 6 - 2 = 3x$

19. Jenny has a snack mix. For every
     2 chocolate chips, there are 6 peanuts.
     If there are 108 peanuts in the mix,
     how many chocolate chips are in the
     mix?

     A   27

     B   36

     C   54

     D   216

20. A blueprint of a house has a scale of
     1 inch = $3\frac{1}{2}$ feet. If a room has a
     length of 21 feet, how long
     would it be on the blueprint?

     A $3\frac{1}{2}$ inches

     B   6 inches

     C   9 inches

     D   21 inches

21. On a road map, the distance from
     Salem to Lancaster is $2\frac{1}{4}$ inches.
     The map scale shows $\frac{1}{2}$ inch equals
     30 miles. What is the distance in
     miles from Salem to Lancaster?

     A   135 miles

     B $82\frac{1}{2}$ miles

     C $67\frac{1}{2}$ miles

     D $33\frac{3}{4}$ miles

22. A candy box is in the shape of a
     triangular prism. It has dimensions of
     $w = 5$ cm, $x = 4$ cm, and $y = 10$ cm.
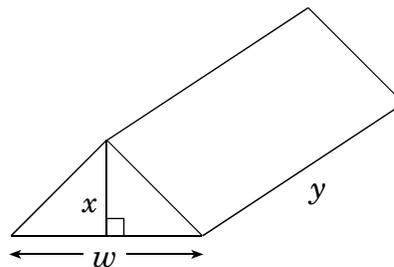
     What is the volume of the candy box?

     A   100 cm^3

     B   150 cm^3

     C   200 cm^3

     D   400 cm^3

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23.   These two triangles are congruent.
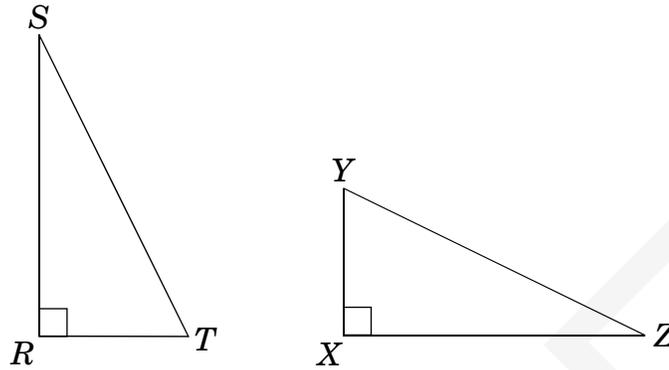
If ∠R corresponds to ∠X, then ∠S corresponds to what angle?

A   ∠T

B   ∠X

C   ∠Y

D   ∠Z

24.   On a blueprint for a house, the front of the house is shown as 12 in. wide and 14 in. tall. If the front of the actual house is 30 ft wide, how tall is the house?

A   25 ft

B   32 ft

C   35 ft

D   44 ft

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25. Which pair contains similar figures?

A   2 2   2 2

    4

           8

B
                        5   4
                          3

           6   8

              7

C   3   2
      2.5

    4   6
        5

D   4
    2

               8

        6
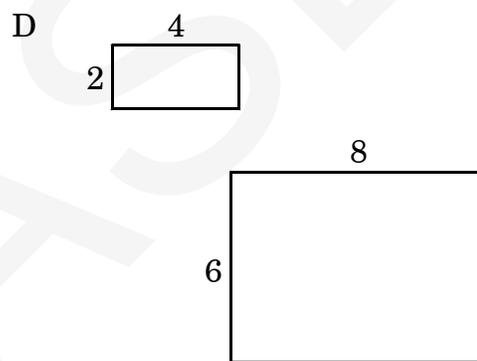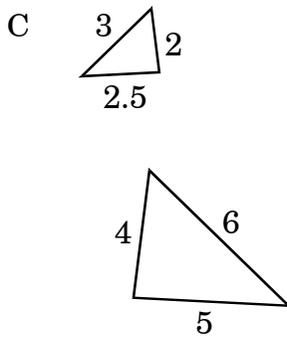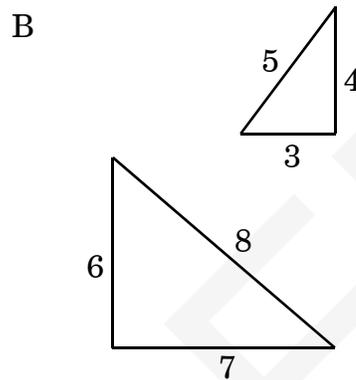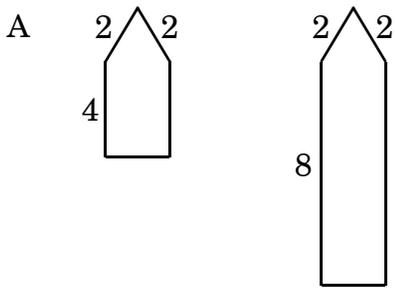
26.   Triangle *HIJ* is similar to triangle *KLM*.

                    I   L
       2.4 ft   J   1.8 ft   M
                                   y
           1.6 ft   K
    H
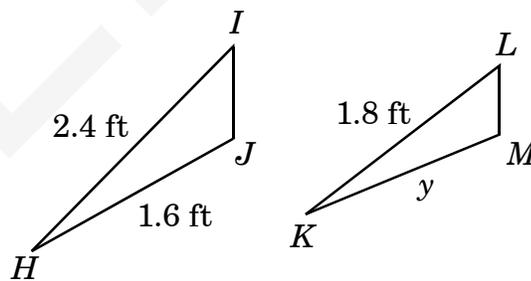
What is the ratio of 1.6 to *y*?

A   4 to 3

B   3 to 4

C   9 to 8

D   8 to 9

27. The scale drawing of a rectangular room has a length of 18 inches and a width of 12 inches. If the scale for the drawing is 1 inch = $2\frac{1}{2}$ feet, what is the perimeter of the actual room?

A   60 feet

B   75 feet

C   120 feet

D   150 feet

28. Calories per serving for desserts are displayed below.

Calories per Serving

Pies	Cakes
60	35
53	142
48	50
52	61
34	70
29	20

What is the mean number of calories for each type of dessert?

A   Pies: 46
     Cakes: 63

B   Pies: 52
     Cakes: 61

C   Pies: 48
     Cakes: 50

D   Pies: 31
     Cakes: 122

29. Ms. Stewart wanted to make a box-and-whisker plot of the results of a recent math test given to her class. She began by collecting the set of data. What should she do first in order to accurately create her graphical representation of the data?

  A find the mean for the set of data

  B throw out any outliers

  C find the upper quartile for the data

  D put the data in order from least to greatest

30. Janet's grades on her first four science quizzes are 82, 89, 82, and 92. What grade on the fifth quiz will give Janet a quiz average of exactly 88?

  A 97

  B 95

  C 93

  D 90

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31. What is the age of the person who would be considered an outlier in the line plot?

Community Theater Members
(by age)

Age (in years)
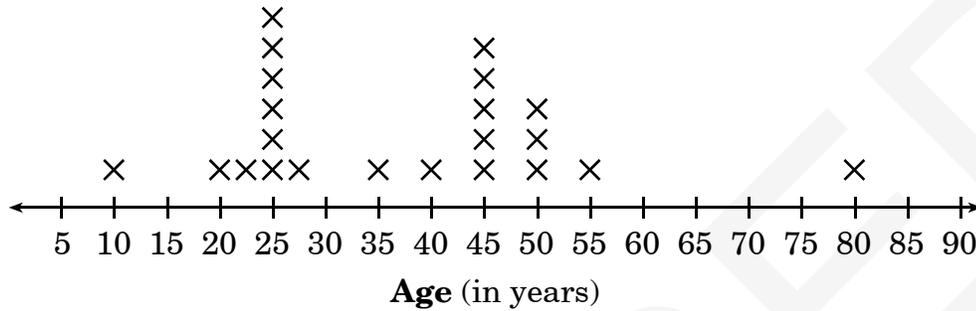
A   10 years

B   25 years

C   80 years

D   There are no outliers.

32. In a sample of 15 adults, 8 have a resting heart rate of 59 beats per minute, 4 have a rate of 72 beats per minute, and 3 have a rate of 93 beats per minute. Which statement ***most accurately*** describes these data?

A   The mean is 69 beats per minute.

B   The mean is 75 beats per minute.

C   The median is 72 beats per minute.

D   The mode is 93 beats per minute.

33. What is the missing number in the linear relation described in the table below?

x	y
1	⁻4
3	⁻2
5	0
15	?

A   9

B   10

C   11

D   14

34. Mae raised $80 by selling boxes of cookies. Let b represent the number of boxes of cookies sold. Each box cost $2.50. Which equation should be used to determine how many boxes of cookies Mae sold?

    A $2.50 + b = 80$

    B $b - 2.50 = 80$

    C $b \div 2.50 = 80$

    D $2.50b = 80$

35. Kevin measured the density, D, of a liquid in science lab. The volume, V, of the liquid was 80 mL. The mass, m, of the liquid was 400 g. What was the density of Kevin's liquid?

    $$\left(D = \frac{m}{V} \right)$$

    A   480 g/mL

    B   320 g/mL

    C   5 g/mL

    D   0.2 g/mL

36. The perimeter of a garden is 82 feet. The length is 5 more than twice the width. What is the width of the garden?

    A   29 feet

    B $25\frac{2}{3}$ feet

    C   24 feet

    D   12 feet

STOP

**End of Mathematics—
Calculator Active**

1.   Nicholas recorded the temperature every hour from 8:00 a.m. to 1:00 p.m. The temperature at 8:00 a.m. was 17°C. The temperature dropped 4°C every hour. What was the temperature at 1:00 p.m?

   A   13°C

   B   5°C

   C   ⁻3°C

   D   ⁻7°C

2.   Anne bought a new pair of skates on sale for $50.00. The sales tax rate was 7%. How much money did Anne spend?

   A $57.00

   B $53.50

   C $50.07

   D $43.00

3.   Isaac practiced the piano three days last week for a total of $9\frac{1}{2}$ hours. On average, how many hours each day did Isaac practice?

   A   3 hours

   B   3 hours 6 minutes

   C   3 hours 10 minutes

   D   4 hours

4.   The cost for grapes is $0.90 per pound. Sam bought 5.2 pounds. How much did Sam spend? (Do not include tax.)

   A $4.30

   B $4.58

   C $4.68

   D $6.10

5.   The walls in a room are being painted. Four cans of paint will cover 480 ft². How many cans will be needed to cover 840 ft²?

   A   8 cans

   B   7 cans

   C   5 cans

   D   3 cans

6.   On a map, $\frac{1}{4}$ inch represents 8 miles. How many miles would 2 inches on the map represent?

   A   8 miles

   B   16 miles

   C   32 miles

   D   64 miles

7.   Paulina's class took a survey of 25 students' favorite foods. Ten of the 25 students chose hot dogs, 28% chose hamburgers, and the rest chose pizza. What percent of the students chose pizza?

A   12%

B   32%

C   68%

D   78%

8.   Tom brought $2\frac{1}{2}$ cakes to class for the class picnic. Twenty-five students will share the cake equally. What fractional part of a cake should each student get so that no cake is left over?

A $\frac{1}{10}$

B $\frac{3}{50}$

C $\frac{1}{25}$

D $\frac{1}{50}$

9.   Anthony repairs bicycles. He charges $5.00 for each bicycle plus $10.00 for each hour ($h$) of work required to repair it. The formula $i = 5 + 10h$ represents Anthony's income (i) for each bicycle repair. Anthony's income for repairing Steve's bicycle was $75.00. How many hours did he work on Steve's bicycle?

A   15

B   8

C   7

D   5

10.   Sue has saved $5,400. Each week, she plans to add $120 to this amount. How many weeks will it take for her total savings to reach at least $6,300?

A   7

B   8

C   45

D   53

11.   Continuing the pattern in the table, what is the value of b when a is 2?

a	b
-3	-10
-1	-4
0	-1
1	2

   A $^-5$

   B $^-1$

   C 1

   D 5

12.   Charlene has eight more dollars than Megan. Together they have $86.00. Which equation can be used to determine the amount of money, m, Megan has?

   A $m + (m + 8) = 86$

   B $m(m + 8) = 86$

   C $m + 8m = 86$

   D $m + m(8m) = 86$

13.   Which sentence represents this equation?

$$4x - 2 = 12$$

   A   Two less than four times a number is 12.

   B   Four times two less than a number is 12.

   C   Four times a number is two less than 12.

   D   Four times a number less than two is 12.

14.   Howard picks apples at an orchard. He earns $4.35 for each hour he works and $2.20 for each bushel he picks. His goal is to earn at least $100 this week. Which inequality will help Howard determine the number of hours (h) and bushels (b) he needs to reach his goal?

   A $4.35h + 2.20b < 100$

   B $4.35h + 2.20b \leq 100$

   C $4.35h + 2.20b > 100$

   D $4.35h + 2.20b \geq 100$

STOP

End of Mathematics—Calculator Inactive

North Carolina Test of Mathematics
Grade 7 Form S RELEASED Fall 2009
Answer Key

CALCULATOR ACTIVE

Item Number	Correct Answer	Goal
1	D	1 — Number and Operations
2	C	2 — Measurement
3	C	2 — Measurement
4	A	3 — Geometry
5	B	3 — Geometry
6	D	3 — Geometry
7	A	3 — Geometry
8	D	3 — Geometry
9	A	4 — Data Analysis and Probability
10	A	4 — Data Analysis and Probability
11	B	4 — Data Analysis and Probability
12	D	4 — Data Analysis and Probability
13	C	4 — Data Analysis and Probability
14	B	5 — Algebra
15	C	5 — Algebra
16	C	5 — Algebra
17	B	5 — Algebra
18	D	5 — Algebra
19	B	1 — Number and Operations
20	B	2 — Measurement
21	A	2 — Measurement
22	A	2 — Measurement
23	D	3 — Geometry
24	C	3 — Geometry
25	C	3 — Geometry
26	A	3 — Geometry
27	D	3 — Geometry
28	A	4 — Data Analysis and Probability
29	D	4 — Data Analysis and Probability
30	B	4 — Data Analysis and Probability
31	C	4 — Data Analysis and Probability
32	A	4 — Data Analysis and Probability
33	B	5 — Algebra
34	D	5 — Algebra
35	C	5 — Algebra
36	D	5 — Algebra

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Grade 7 Form S RELEASED Fall 2009
Answer Key

CALCULATOR INACTIVE

Item Number	Correct Answer	Goal
1	C	1 — Number and Operations
2	B	1 — Number and Operations
3	C	1 — Number and Operations
4	C	1 — Number and Operations
5	B	1 — Number and Operations
6	D	1 — Number and Operations
7	B	1 — Number and Operations
8	A	1 — Number and Operations
9	C	5 — Algebra
10	B	5 — Algebra
11	D	5 — Algebra
12	A	5 — Algebra
13	A	5 — Algebra
14	D	5 — Algebra

North Carolina Test of Mathematics
Grade 7 Form S RELEASED Fall 2009
Raw to Scale Score Conversion

Raw Score	Scale Score
0	332
1	333
2	333
3	334
4	335
5	335
6	336
7	337
8	338
9	339
10	340
11	341
12	342
13	344
14	345
15	346
16	347
17	349
18	350
19	351
20	351
21	352
22	353
23	354
24	355
25	356
26	356
27	357
28	358
29	358
30	359
31	360
32	360
33	361
34	362
35	363
36	363
37	364
38	365
39	366
40	366
41	367

42	368
43	369
44	370
45	371
46	373
47	374
48	376
49	378
50	382