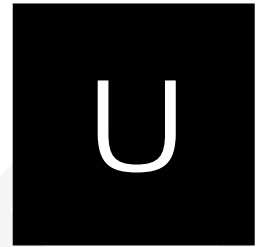Grade 6

Form U

U

North Carolina

End-of-Grade Tests–Grade 6

Mathematics—Calculator Active

Mathematics—Calculator Inactive (page 17)

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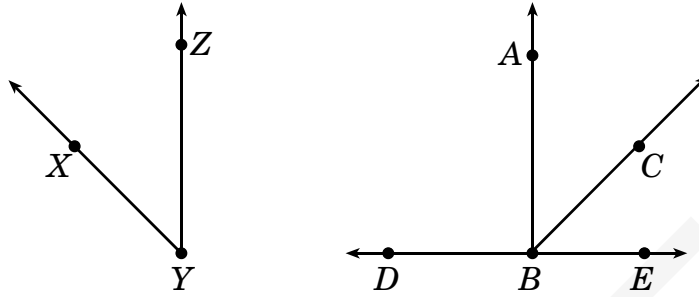State Board of Education
Department of Public Instruction
Division of Accountability Services/North Carolina Testing Program
Raleigh, North Carolina 27699-6314

NCDPI

North Carolina Test of Mathematics. Grade 6 Form U RELEASED Fall 2009

1.   What is the relationship between ∠*ABC* and ∠*XYZ*?

A   Both are about 90°.

B   Both are about 45°.

C   Both are straight angles.

D   Both are obtuse angles.

2.   The dimensions of Joe's rectangular garden are 18 feet by 12 feet. Joe wants to conduct an experiment to determine whether using fertilizer in the garden makes a difference. The fertilizer costs $0.45 per square foot of ground covered. How much will it cost to cover half of the garden with fertilizer?

A $216.00

B $97.20

C $48.60

D $24.30

3. A baker has a circular cake pan that has a radius of 10 cm. What is the ***approximate*** area of the bottom of the cake pan?

A 1,257 cm^2

B 314 cm^2

C 63 cm^2

D 31 cm^2

4. What is the distance from the center of a circle to any point on the circle?
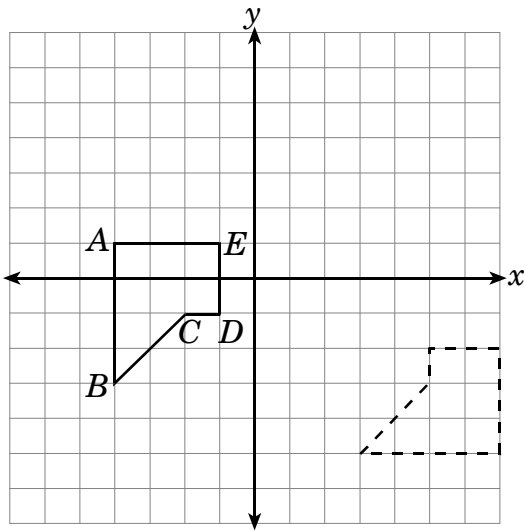
A radius

B circumference

C diameter

D chord

5. The clock in Mr. Neal's classroom has a circumference of 34.5 inches. What is the ***approximate*** diameter of the clock?

A 2 inches

B 6 inches

C 11 inches

D 22 inches

Go to next page

NCDPI

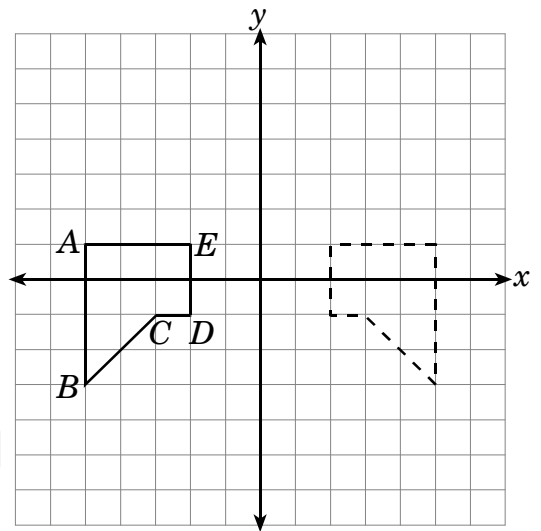North Carolina Test of Mathematics. Grade 6 Form U RELEASED Fall 2009

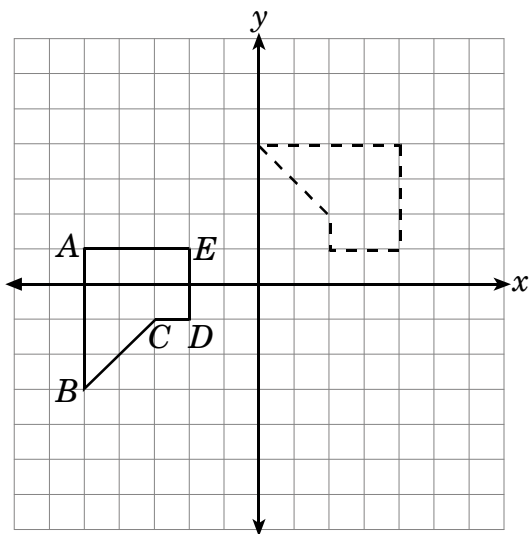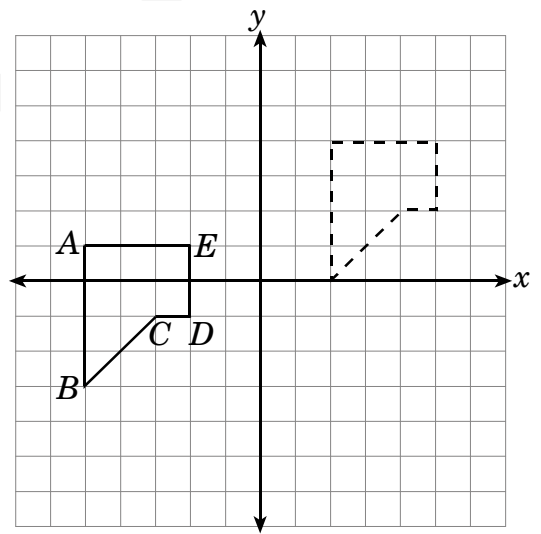6.   Which picture shows only a translation of polygon *ABCDE*?

A

B

C

D

7. $\triangle PQR$ has the coordinates $(3, 1), (5, 2),$ and $(4, 3)$.
$\triangle P'Q'R'$ has coordinates $(^-1, 2)$, $(1, 3),$ and $(0, 4)$. Which choice describes the translation of $\triangle PQR$ to $\triangle P'Q'R'$?

   A   left 4 units and down 1 unit

   B   right 4 units and up 1 unit

   C   left 4 units and up 1 unit

   D   right 4 units and down 1 unit

8. Two parallel lines are located 4 inches apart. A circle with a diameter of 5 inches is drawn in the same plane. What is the maximum number of intersections possible between the two parallel lines and the circle?

   A   6

   B   4

   C   3

   D   2

9. There are 2 yellow marbles, 4 red marbles, 6 blue marbles, and 3 green marbles in a bag. Miguel will choose a marble at random from the bag. What is the probability that the marble will be yellow?

   A $\dfrac{2}{15}$

   B $\dfrac{2}{13}$

   C $\dfrac{1}{5}$

   D $\dfrac{1}{9}$

10. A restaurant is serving a platter of vegetable strips with 10 pieces of broccoli, 15 carrots, and 5 pieces of cauliflower. What is the probability of choosing a carrot without looking?

   A $\dfrac{1}{6}$

   B $\dfrac{1}{3}$

   C $\dfrac{1}{2}$

   D   1

11. Hector has 3 shirts, 3 pairs of shorts, and 2 pairs of shoes in his locker for gym class. How many different outfits consisting of 1 shirt, 1 pair of shorts, and 1 pair of shoes can he make?

A   3

B   8

C   12

D   18

12. Derek's math teacher put some candy in a brown paper bag. The bag contains 4 lemon, 6 lime, 8 cherry, 2 pineapple, 5 orange, and 5 grape candies. All 14 students ahead of Derek selected a candy to eat, but no one got pineapple. What is the probability that Derek will draw out a pineapple candy?

A $\frac{7}{8}$

B $\frac{1}{2}$

C $\frac{7}{15}$

D $\frac{1}{8}$

13.   The 10 students who sell the most magazines in a contest get to draw a card from a box containing 10 cards. The students keep the card they draw. Three cards are red, and the rest are blue. Students who draw a red card win a T-shirt. Students who draw a blue card win a notebook. The table below shows the first three draws. Devon will make the fourth draw.

Results of the Card Draw

Order of Draw	Student	Color of Card Drawn
1	Sarah	blue
2	Evan	red
3	Tara	blue
4	Devon	?

What is the probability that Devon will win a T-shirt?

A $\dfrac{2}{7}$

B $\dfrac{2}{10}$

C $\dfrac{3}{7}$

D $\dfrac{3}{10}$

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14. The fair spinner below is spun three times.
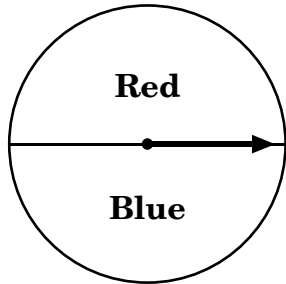
What is the probability that the spinner will land on red the first time, blue the second time, and red the third time?

A $\frac{1}{8}$

B $\frac{1}{2}$

C $\frac{2}{3}$

D $\frac{3}{2}$

15. Brad used the formula $d = \frac{n}{5}$ to find the distance in miles, d, he was from a stroke of lightning. In the formula, n is the number of seconds that have elapsed between seeing the lightning and hearing the thunder. How far away was Brad from the lightning if 30 seconds elapsed between Brad seeing the lightning and hearing the thunder?

A 3 miles

B 6 miles

C 9 miles

D 12 miles

16. In designing a gasoline storage tank, an engineer had to use the equation $2.5t = 1.625$, where t is the minimum thickness of the walls. What is the required minimum thickness of the walls?

A 0.25 units

B 0.56 units

C 0.65 units

D 1.65 units

17. What is the ratio of the amount of rainfall on Wednesday to the amount of rainfall on Friday?

Daily Rainfall
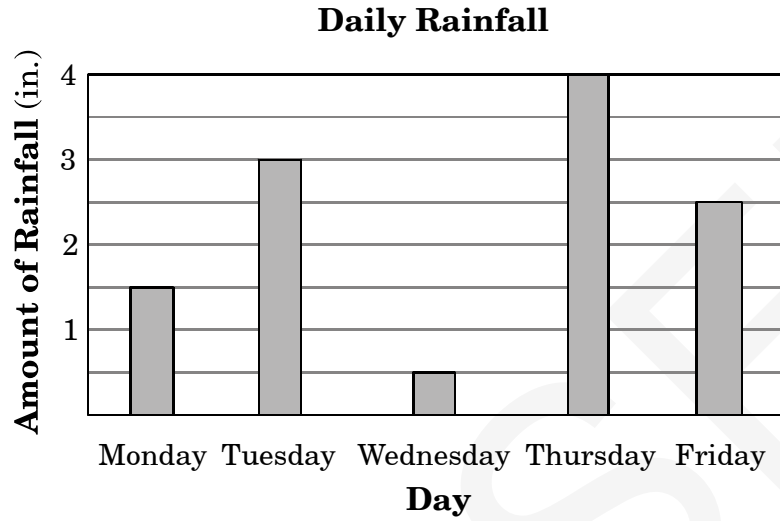
A 1 : 8

B 1 : 5

C 1 : 3
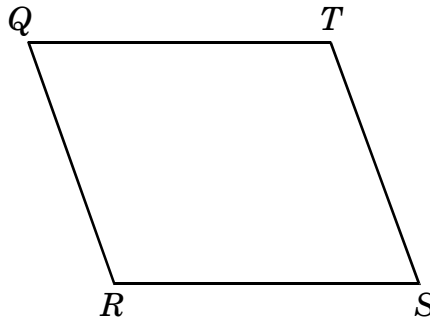
D 3 : 5

---

18. Which expression has the same value as $4 \times k + 4 \times 3$?

A $k \times (4 + 3)$

B $3 \times (k + 4)$

C $4 \times (k \times 3)$

D $4 \times (k + 3)$

19.   In parallelogram $QRST$ below, what is the **approximate** measure of $\angle QRS$?

Q   T

R   S

A   30°

B   70°

C   110°

D   150°

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North Carolina Test of Mathematics. Grade 6 Form U RELEASED Fall 2009
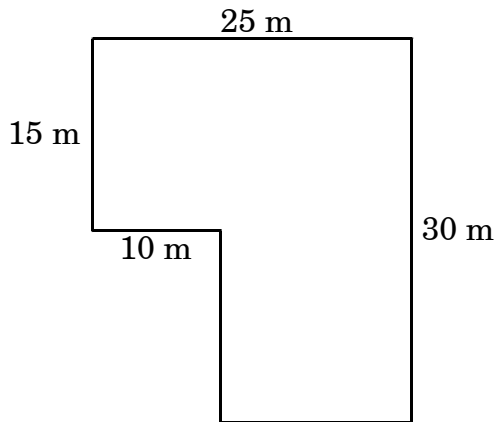
20.   What is the perimeter of the rectangle drawn in the coordinate plane?
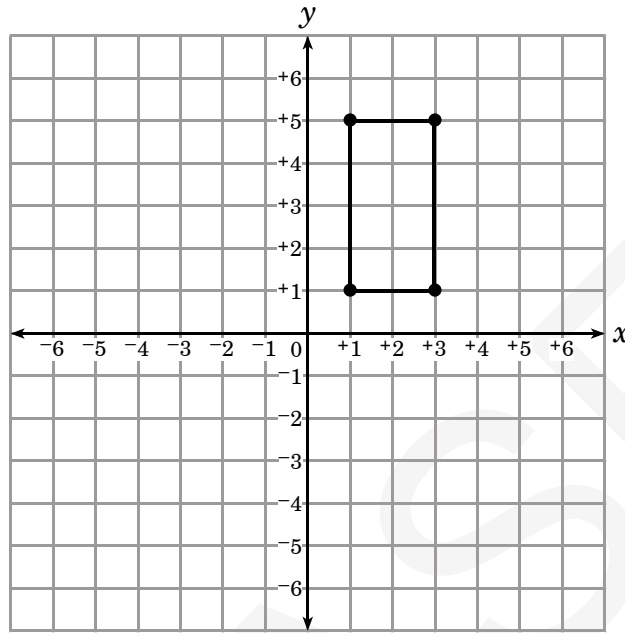
    A   12 units

    B   8 units

    C   6 units

    D   4 units

21. The dimensions of a swimming pool are given below in the drawing.

```
        25 m
   ┌──────────────┐
   │              │
15 m│              │
   │        ┌─────┤
   └────────┘     │30 m
      10 m        │
            │     │
            └─────┘
```

What is the area of the swimming pool?

A   150 m^2

B   225 m^2

C   375 m^2

D   600 m^2

22. The area of a rectangle is 352 square inches. The measure of each of the shorter sides equals the perimeter of a square with 4-inch sides. What is the measure of each of the longer sides of the rectangle?

A   16 inches

B   22 inches

C   44 inches

D   88 inches

23. The diameter of circle F is 5. Circle G has a diameter that is double that of circle F. Which statement is correct about circle G?

A   The circumference of circle G is half the circumference of circle F.

B   The circumference of circle G is double the circumference of circle F.

C   The radius of circle G is the same as the radius of circle F.

D   The radius of circle G is half the radius of circle F.

24. $\triangle MNO$ is translated so that N' has coordinates $(14, 4)$.
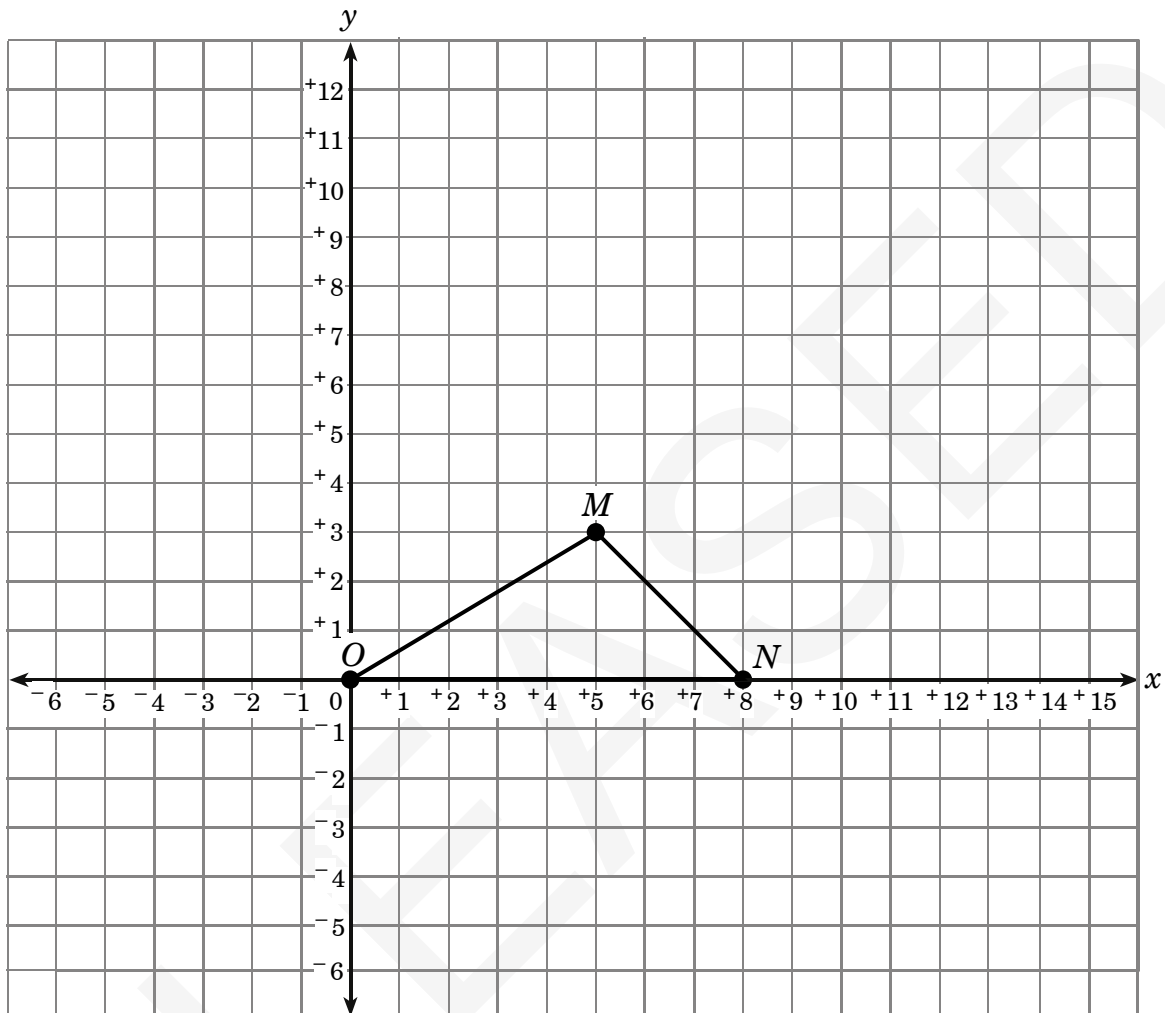
What are the coordinates of M'?

A (6, 4)

B (6, 7)

C (11, 4)

D (11, 7)

25. On rectangle *JKLM*, *J* is located at the point $(7, {}^-3)$. If *JKLM* is translated 9 units to the left and 4 units down, where will *J'* be located?

    A $(16, {}^-7)$

    B $(16, 1)$

    C $({}^-2, 1)$

    D $({}^-2, {}^-7)$

26. Circle *M* is centered at $(0, 0)$ and has a radius of 4. Circle *N* is centered at $(2, 2)$ and has a radius of 3. At how many points do these two circles intersect?

    A   0

    B   1

    C   2

    D   3

27. Nathan drew a circle on a grid with a radius of 4 units and the point $(2, {}^-1)$ as its center. Which of the following pairs of coordinates represent points on the circle?

    A $(2, {}^-5)$ and $(6, {}^-1)$

    B $(2, 3)$ and $({}^-1, {}^-1)$

    C $(4, 0)$ and $(0, 4)$

    D $(8, {}^-4)$ and $(6, {}^-3)$

28. A board game has 64 colored cards: 15 red, 9 blue, 10 yellow, 15 green, 10 orange, and 5 purple. What is the probability of choosing a blue or purple card on the first draw?

A $\frac{45}{64}$

B $\frac{14}{64}$

C $\frac{9}{64}$

D $\frac{5}{64}$

29. Marsha wants to find out how other students at her school get to school each day. Which of the following groups, if surveyed, would give her the *most accurate* sample of the student body?

A her homeroom class

B the students on her bus

C students waiting in the carpool area

D members of the cycling club

30. Gordon tossed a fair coin 20 times and recorded his results in the table below.

Heads	Tails
卌 |||	卌 卌 ||

Based on the rules of probability, which statement is true?

A Gordon will most likely toss tails on the next toss of the coin.

B The number of heads Gordon actually tossed was greater than the number of heads Gordon was expected to toss.

C The number of heads Gordon actually tossed was the same as the number of heads Gordon was expected to toss.

D The number of heads Gordon actually tossed was less than the number of heads Gordon was expected to toss.

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31. There are 10 blue candies, 6 brown candies, 5 red candies, and 3 yellow candies in a bag. Patrice is pulling candies out of the bag without looking. She eats each candy she pulls out. If the first candy Patrice pulls out is red, what is the probability that the second one is brown?

A $\frac{6}{23}$

B $\frac{6}{24}$

C $\frac{5}{23}$

D $\frac{5}{24}$

32. Gwen has a drink and a bowl of cereal topped with fruit for breakfast every morning. She has a choice of three cereals that she can top with either bananas, raisins, strawberries, or blueberries. Her drink choices are orange juice, apple juice, or milk. How many different breakfast combination choices does Gwen have?

A 10

B 12

C 24

D 36

33. What is the value of x if $3x + 4 = 103$?

A 25

B $26\frac{1}{2}$

C 33

D $35\frac{2}{3}$

34. Nine children and six adults bought tickets to the circus. Which expression represents the total cost if c represents the cost of a child's ticket and a represents the cost of an adult's ticket?

A $9c + 6a$

B $6c + 9a$

C $15ac$

D $15(a + c)$

35. If H represents Harry's age, and S represents Steve's age, what does the algebraic sentence $H = S + 3$ mean?

A Harry is 3 years older than Steve.

B Harry is 3 years younger than Steve.

C Harry is 3 times as old as Steve.

D Harry and Steve are the same age.

36. The graph below shows the percentage of people who work in managerial, clerical, support, and manufacturing jobs at a company.

Company Departments
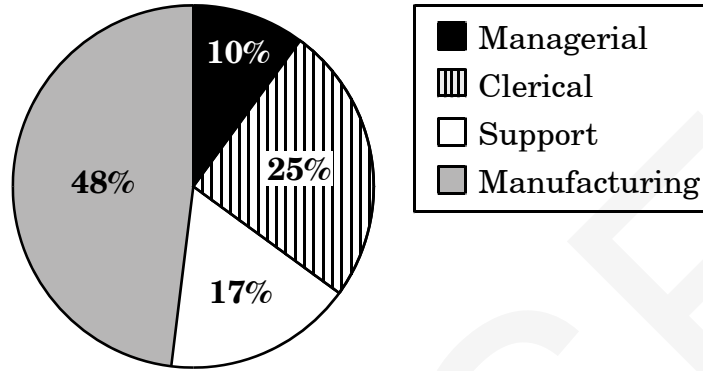
What is the *approximate* ratio of manufacturing workers to managerial workers at this company?

A   1 : 4

B   1 : 5

C   4 : 1

D   5 : 1

STOP

End of Mathematics—Calculator Active

NCDPI

North Carolina Test of Mathematics. Grade 6 Form U RELEASED Fall 2009

1. How is negative five-tenths written numerically?

   A   ⁻0.510

   B   ⁻0.5

   C   ⁻5

   D   ⁻50

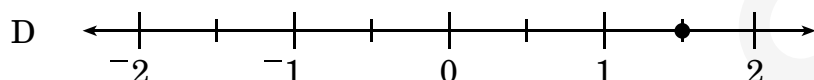2. A piece of rope 6.3 meters long is cut into 9 equal pieces. How long is each piece of rope?

   A   0.7 meter

   B   7 meters
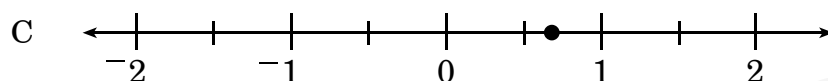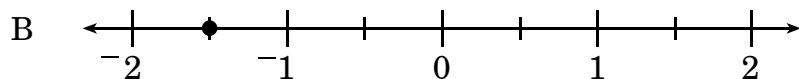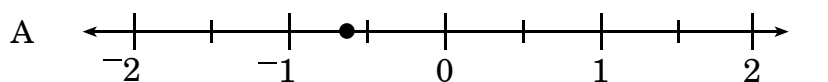
   C   15.3 meters

   D   56.7 meters

3. What is the greatest common factor of 45 and 60?

   A   3

   B   5

   C   15

   D   30

4. Which number line shows the graph of $\dfrac{^{-}3}{2}$?

A

B

C

D

5. A person can walk at a rate of $2\dfrac{1}{2}$ miles per hour. How long would it take the person to walk 10 miles?

A   15 minutes

B   4 hours

C   10 hours

D   25 hours

6. Tom finished $\frac{1}{3}$ of the 30 problems assigned in class. Steven did $\frac{3}{10}$ of the problems. Juan finished 20% of the problems. Marcus completed 8 out of 30 problems. Who completed the most problems?

A   Tom

B   Steven

C   Juan

D   Marcus

7. A salesman at a jewelry store gets paid 30% of the selling price of each piece of jewelry he sells. *About* how much will he get paid for selling a ring that costs $495?

A $30

B $80

C $120

D $150

8. Nikki made 2 gallons of punch with fruit juice and ginger ale. The recipe requires $1\frac{1}{2}$ gallons of ginger ale. What percent of the total recipe is fruit juice?

A   50%

B $33\frac{1}{3}$%

C   25%

D   10%

9. David and three friends had lunch together. They all ordered the same meal except David who had an extra soft drink at a cost of $1.07 (including tax). The total bill (including tax) was $10.27. What was David's share of the total bill?

A $1.07

B $2.30

C $2.57

D $3.37

10. Which of the following is equivalent to $\dfrac{2 \bullet 3^2 \bullet 5^4}{4 \bullet 3^3 \bullet 5^2}$?

    A $\dfrac{25}{6}$

    B $\dfrac{5}{6}$

    C $\dfrac{2}{3}$

    D $\dfrac{1}{2}$

11. The vestibule is a small round chamber in the central part of the inner ear. If the vestibule is 0.005 meter long, how is this expressed in scientific notation?

    A 0.5×10^3 m

    B 5×10^3 m

    C 0.5×10^{-3} m

    D 5×10^{-3} m

12. What is the value of n in the equation $\dfrac{n}{6} + 3 = 12$?

    A   90

    B   54

    C $\dfrac{5}{2}$

    D $\dfrac{3}{2}$

13. Evaluate this expression when $x = 2$ and $y = 3$.

$$4x^2 + 3xy^2 + y^2$$

    A   97

    B   80

    C   79

    D   61

14.   Simplify: $6b + 4a + 3a - 2b$

       A $4b + 7a$

       B $11ab$

       C $9a - 2b$

       D $10a + b$

STOP

End of Mathematics—Calculator Inactive

North Carolina Test of Mathematics
Grade 6 Form U RELEASED Fall 2009
Answer Key

CALCULATOR ACTIVE

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

North Carolina Test of Mathematics
Grade 6 Form U RELEASED Fall 2009
Answer Key

CALCULATOR INACTIVE

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