2007

Green River

Regional Educational Cooperative

Grade 7
Mathematics

Multiple Choice

Measured Progress

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Multiple Choice Item 1

Standard: MA-07-1.1.2: Number Sense — Students will describe and provide examples of representations of numbers (whole numbers, fractions, decimals, percents, integers, square roots, and π) and operations in a variety of equivalent forms using models, diagrams, and symbols (e.g., number lines, 10 by 10 grids, rectangular arrays, number sentences), based on real-world and mathematical problems.

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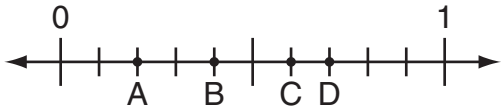
Answer Key: D

Portion of Standard Being Addressed
This item requires the student to compare numbers on the number line based on real-world problems.

1. Gene has $\frac{3}{5}$ of a pound of grapes. Mark has more grapes than Gene has. On the number line below, the space between 0 and 1 has been divided into 10 equal parts.



Which point on the number line could show the number of pounds of grapes that **Mark** has?

A. point A
B. point B
C. point C
D. point D

Multiple Choice Item 2

Standard: MA-07-1.1.3: Number Sense — Students will convert among whole numbers, fractions, decimals, percents and π, and will compare and order these numbers.

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Answer Key: A

Portion of Standard Being Addressed
This item requires the student to order fractions and decimals.

2. Which list shows numbers in order from least to greatest?

   A. 0.09, $\frac{1}{10}$, 0.11, $\frac{1}{8}$

   B. $\frac{1}{8}$, 0.09, $\frac{1}{10}$, 0.11

   C. $\frac{1}{10}$, $\frac{1}{8}$, 0.09, 0.11

   D. $\frac{1}{8}$, $\frac{1}{10}$, 0.11, 0.09

Multiple Choice Item 3

Standard: MA-07-1.1.3: Number Sense — Students will convert among whole numbers, fractions, decimals, percents and π, and will compare and order these numbers.

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Answer Key: B

Portion of Standard Being Addressed
This item requires the student to convert between fractions and percents.

3. Greg is putting fraction and percent cards in order from least to greatest. He placed the two percent cards shown below on the table.

50% **90%**

Which fraction card should Greg place **between** the 50% and 90% cards?

A. $\frac{2}{5}$

B. $\frac{5}{8}$

C. $\frac{3}{3}$

D. $\frac{6}{4}$

Multiple Choice Item 4

Standard: MA-07-1.2.1: Estimation — Students will estimate to solve real-world and mathematical problems with fractions, decimals and percents, checking for reasonable and appropriate computational results.

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Answer Key: D

Portion of Standard Being Addressed
This item requires the student to estimate to solve real-world problems with percents.

4. Kevin scored 48 points out of a possible 59 points on a test. Which of the following is the best estimate for the percent of questions he answered correctly?

   A. 50%
   B. 60%
   C. 66%
   D. 80%

Multiple Choice Item 5

Standard: MA-07-1.3.1: Number Operations — Students will add, subtract, multiply and divide whole numbers, fractions and decimals to solve real-world problems and apply order of operations (including positive whole number exponents) to simplify numerical expressions.

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Answer Key: C

Portion of Standard Being Addressed
This item requires the student to simplify a numerical expression written in fractional form by applying order of operations.

5. What is the simplest form of the expression below?

$$6\left(\frac{\frac{2}{5}\cdot 10}{10\div\frac{5}{2}}\right)$$

A. $\frac{24}{25}$

B. 1

C. 6

D. 24

Multiple Choice Item 6

Standard: MA-07-1.3.1: Number Operations — Students will add, subtract, multiply and divide whole numbers, fractions and decimals to solve real-world problems and apply order of operations (including positive whole number exponents) to simplify numerical expressions.

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Answer Key: B

Portion of Standard Being Addressed
This item requires the student to add and multiply whole numbers to solve real-world problems.

6. A plumber charges $75 for a service call plus $48 per hour of work. How much would the plumber charge for a 3-hour service call?

   A. $126
   B. $219
   C. $273
   D. $369

Multiple Choice Item 7

Standard: MA-07-1.3.1: Number Operations — Students will add, subtract, multiply and divide whole numbers, fractions and decimals to solve real-world problems and apply order of operations (including positive whole number exponents) to simplify numerical expressions.

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Answer Key: A

Portion of Standard Being Addressed
This item requires the student to apply order of operations to simplify numerical expressions.

7. What is the value of the expression $3 \times 2^2 - 2^3$?

   A. 4
   B. 6
   C. 28
   D. 30

Multiple Choice Item 8

Standard: MA-07-1.3.1: Number Operations — Students will add, subtract, multiply and divide whole numbers, fractions and decimals to solve real-world problems and apply order of operations (including positive whole number exponents) to simplify numerical expressions.

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Answer Key: C

Portion of Standard Being Addressed
This item requires the student to add and subtract fractions to solve real-world problems.

8. Terry used his allowance in the following way:
   - He spent $\frac{1}{4}$ on snacks,
   - $\frac{1}{3}$ on entertainment, and
   - put the rest in savings.

   What fraction of his allowance did he use for savings?

   A. $\frac{2}{7}$

   B. $\frac{5}{7}$

   C. $\frac{5}{12}$

   D. $\frac{7}{12}$

Multiple Choice Item 9

Standard: MA-07-1.3.3: Number Operations — Students will add and subtract integers.

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Answer Key: B

Portion of Standard Being Addressed
This item requires the student to add and subtract integers.

9. Kelly and Steve are playing a game with yellow and red chips. Each yellow chip is worth 1 point, and each red chip is worth –1 point. Kelly has 27 yellow chips and 83 red chips.

   What is her score?

   A. –100
   B. –56
   C. 56
   D. 100

Multiple Choice Item 10

Standard: MA-07-1.4.1: Ratios and Proportional Reasoning — Students will apply ratios and proportional reasoning to solve real-world problems (e.g., percents, sales tax, discounts, rate).

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Answer Key: B

Portion of Standard Being A ddressed
This item requires the student to find the percent of increase in a real-world problem.

10. The population of a county increased from 12,000 to 14,350. To the nearest percent, what was the percent increase?

    A. 16%
    B. 20%
    C. 84%
    D. 120%

Multiple Choice Item 11

Standard: MA-07-1.5.1: Properties of Numbers and Operations — Students will identify and apply prime numbers, composite numbers, prime factorization, factors, multiples and divisibility to solve real-world and mathematical problems (e.g., prime factorization to determine a least common multiple [LCM] or greatest common factor [GCF]).

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Answer Key: C

Portion of Standard Being Addressed
This item requires the student to apply factors and divisibility to solve mathematical problems.

11. Use the information in the box below to answer the question.

> I go evenly into 100, but not into 10. To check whether a number is divisible by me, you need to look at the number's last two digits.

Which of the numbers below could I be?

A. 2
B. 3
C. 4
D. 5

Multiple Choice Item 12

Standard: MA-07-1.5.1: Properties of Numbers and Operations — Students will identify and apply prime numbers, composite numbers, prime factorization, factors, multiples and divisibility to solve real-world and mathematical problems (e.g., prime factorization to determine a least common multiple [LCM] or greatest common factor [GCF]).

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Answer Key: B

Portion of Standard Being Addressed
This item requires the student to apply multiples to solve real-world problems.

12. An engineer inspects cars as they come through an assembly line. The body of every 6th car is inspected, the engine of every 8th car is inspected, and the paint on every 10th car is inspected. Which car will be the first to have its body, engine, and paint inspected?

    A. the 80th car
    B. the 120th car
    C. the 240th car
    D. the 480th car

Multiple Choice Item 13

Standard: MA-07-2.1.1: Measuring Physical Attributes — Students will measure lengths (to the nearest eighth of an inch or the nearest centimeter) and will determine and use in real-world and mathematical problems:

- area and perimeter of triangles;
- area and perimeter of quadrilaterals (rectangles, squares, trapezoids) (using the Pythagorean theorem will not be required as a strategy);
- area and circumference of circles and
- area and perimeter of compound figures composed of triangles, quadrilaterals and circles.

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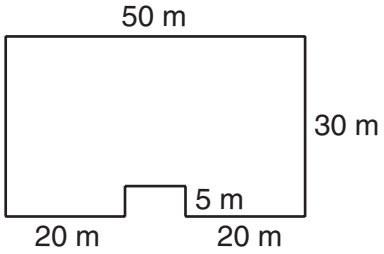
Answer Key: D

Portion of Standard Being Addressed
This item requires the student to determine the perimeter of compound figures composed of quadrilaterals.

13. In the courtyard shown below, all angles are right angles.



What is the perimeter of the courtyard?

A. 125 m
B. 140 m
C. 160 m
D. 170 m

Multiple Choice Item 14

Standard: MA-07-2.1.1: Measuring Physical Attributes — Students will measure lengths (to the nearest eighth of an inch or the nearest centimeter) and will determine and use in real-world and mathematical problems:

- area and perimeter of triangles;
- area and perimeter of quadrilaterals (rectangles, squares, trapezoids) (using the Pythagorean theorem will not be required as a strategy);
- area and circumference of circles and
- area and perimeter of compound figures composed of triangles, quadrilaterals and circles.

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Answer Key: C

Portion of Standard Being Addressed
This item requires the student to determine the area of a quadrilateral.

14. A square window is $1\frac{2}{3}$ feet wide. What is the area of the window?

A. $6\frac{2}{3}$ square feet

B. $3\frac{1}{3}$ square feet

C. $2\frac{7}{9}$ square feet

D. $\frac{4}{9}$ square feet

Multiple Choice Item 15

Standard: MA-07-2.1.1: Measuring Physical Attributes — Students will measure lengths (to the nearest eighth of an inch or the nearest centimeter) and will determine and use in real-world and mathematical problems:

- area and perimeter of triangles;
- area and perimeter of quadrilaterals (rectangles, squares, trapezoids) (using the Pythagorean theorem will not be required as a strategy);
- area and circumference of circles and
- area and perimeter of compound figures composed of triangles, quadrilaterals and circles.

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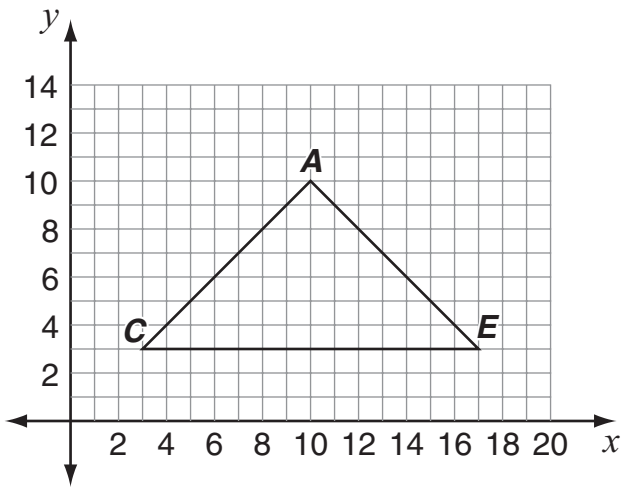
Answer Key: B

Portion of Standard Being Addressed
This item requires the student to determine the area of a triangle.

15. Look at the triangle below.



What is the area of triangle *ACE*?

A. 30 square units
B. 49 square units
C. 70 square units
D. 98 square units

Multiple Choice Item 16

Standard: MA-07-2.1.2: Measuring Physical Attributes — Students will estimate measurements of regular and irregular polygons and circles in standard units.

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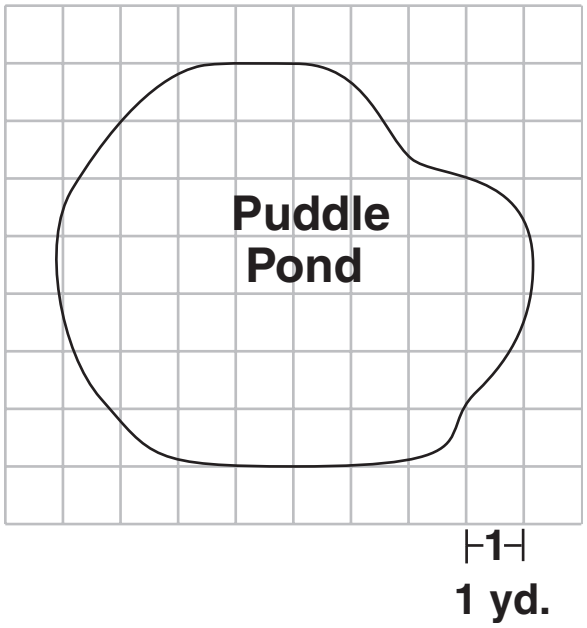
Answer Key: B

Portion of Standard Being Addressed
This item requires the student to estimate measurements of a figure in standard units.

16. The map below shows Puddle Pond.



Which is the best estimate of the area of the pond?

A. 40 square yards
B. 45 square yards
C. 50 square yards
D. 55 square yards

Multiple Choice Item 17

Standard: MA-07-2.1.3: Measuring Physical Attributes — Students will explain how measurements and measurement formulas are related or different (e.g., perimeter and area of rectangles).

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Answer Key: B

Portion of Standard Being Addressed
This item requires the student to explain how measurements and measurement formulas are related.

17. A rectangle has a width of 6 inches and a perimeter of 30 inches. What is the area of the rectangle?
    A. 36 square inches
    B. 54 square inches
    C. 108 square inches
    D. 144 square inches

Multiple Choice Item 18

Standard: MA-07-2.1.4: Measuring Physical Attributes — Students will find the measures of angles by estimation and measurement with a protractor or angle ruler.

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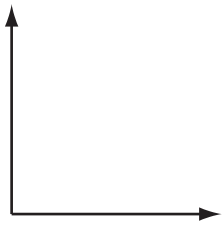
Answer Key: C

Portion of Standard Being Addressed
This item requires the student to find the measures of angles by estimation.

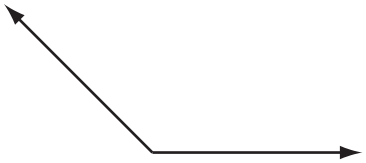
18. Which angle has a measure that is closest to 135°?

A.

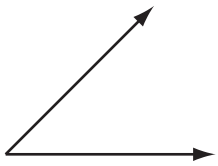


B.

C.



D.



Multiple Choice Item 19

Standard: MA-07-2.2.1: Systems of Measurement — Students will convert units within the same measurement system and use these units to solve real-world problems.

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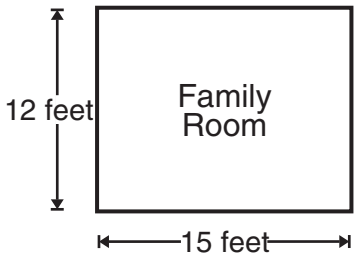
Answer Key: B

Portion of Standard Being Addressed
This requires students to convert square feet to square yards after finding the area of a rectangular figure.

19. Use the floor plan below to answer the question.



How many square yards of carpeting will just cover the floor of the family room?

A. 18 square yards
B. 20 square yards
C. 54 square yards
D. 180 square yards

Multiple Choice Item 20

Standard: MA-07-2.2.1: Systems of Measurement — Students will convert units within the same measurement system and use these units to solve real-world problems.

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Answer Key: D

Portion of Standard Being Addressed
This item requires the student to convert units within the same measurement system and use these units to solve real-world problems.

20. Dolly is using a 5-quart pail to fill a 15-gallon fish tank. How many times will she need to fill the pail?

    A. 3.75
    B. 6
    C. 9.5
    D. 12

Multiple Choice Item 21

Standard: MA-07-3.1.1: Shapes and Relationships — Students will describe, provide examples of and identify (using correct notation, label and name) the basic geometric elements (e.g., points, segments, rays, lines, angles and planes), in real-world and mathematical problems.

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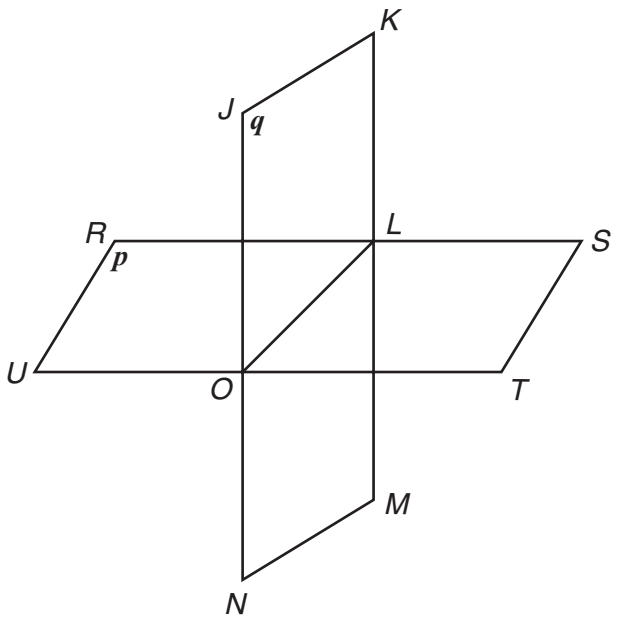
Answer Key: C

Portion of Standard Being Addressed
This item requires the student to identify the basic geometric elements in mathematical problems.

21. Two intersecting planes, p and q, are shown below.



What is the intersection of planes p and q?

A. points O and L
B. the segment with endpoints O and L
C. the line containing points O and L
D. the ray with endpoint O containing L

Multiple Choice Item 22

Standard: MA-07-3.1.2: Shapes and Relationships — Students will describe and provide examples of the elements (e.g., sides, vertices, angles, congruent parts) of two-dimensional figures (circles, triangles [acute, right, obtuse, scalene, isosceles, equilateral], quadrilaterals [square, rectangle, rhombus, parallelogram, trapezoid], regular polygons), and will apply these elements and figures to solve real-world and mathematical problems.

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Answer Key: B

Portion of Standard Being Addressed
This item requires the student to identify the type of triangle when given the angle measures.

22. A triangle has the following angle measures:

114°, 33°, and 33°

What type of triangle is it?

A. acute triangle
B. obtuse triangle
C. equilateral triangle
D. right triangle

Multiple Choice Item 23

Standard: MA-07-3.1.4: Shapes and Relationships — Students will describe and provide examples of congruent and similar figures, and will apply congruent and similar figures to solve real-world and mathematical problems.

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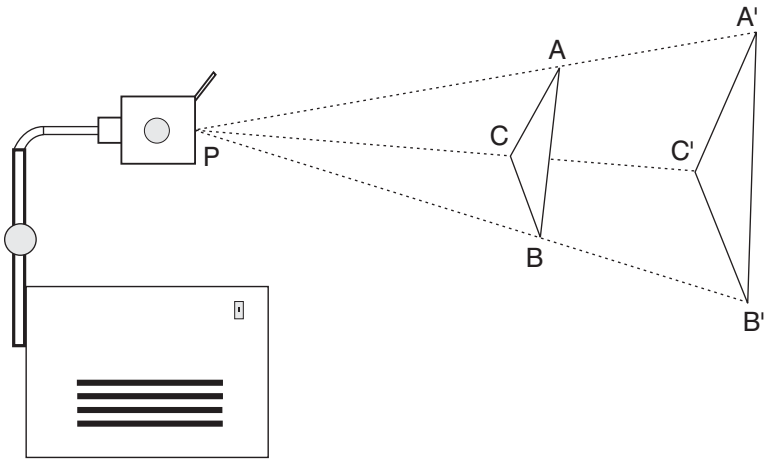
Answer Key: C

Portion of Standard Being Addressed
This item requires the student to identify similar triangles.

23. Use the diagram below to answer the question.



An overhead projector projects the shape of ΔABC onto a screen as shown in the diagram. The screen is moved back 5 feet and the new ΔA'B'C' is seen on the screen. What relationship exists between ΔABC and ΔA'B'C'?

A. The sides of ΔABC are congruent to the corresponding sides of ΔA'B'C'.

B. The angle measures of ΔA'B'C' are greater than the corresponding angle measures of ΔABC.

C. ΔABC is similar to ΔA'B'C'.

D. ΔABC is congruent to ΔA'B'C'.

Multiple Choice Item 24

Standard: MA-07-3.2.2: Transformations of Shapes — Students will translate (slide) and reflect (flip) figures in a coordinate plane.

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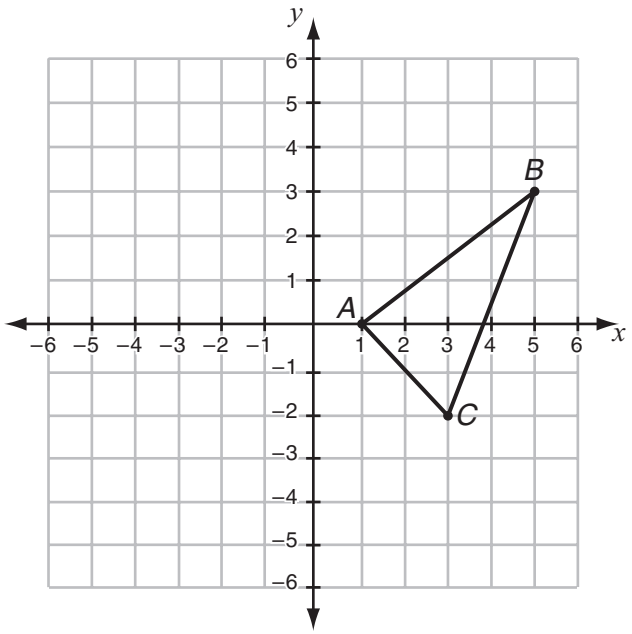
Answer Key: A

Portion of Standard Being Addressed
This item requires the student to reflect a triangle in a coordinate plane.

24. Look at ΔABC on the coordinate plane below.



If ΔABC is reflected across the y-axis, what will be the new coordinates of vertex B?

A. (–5, 3)
B. (–3, 5)
C. (–5, –3)
D. (–3, –5)

Multiple Choice Item 25

Standard: MA-07-3.2.2: Transformations of Shapes — Students will translate (slide) and reflect (flip) figures in a coordinate plane.

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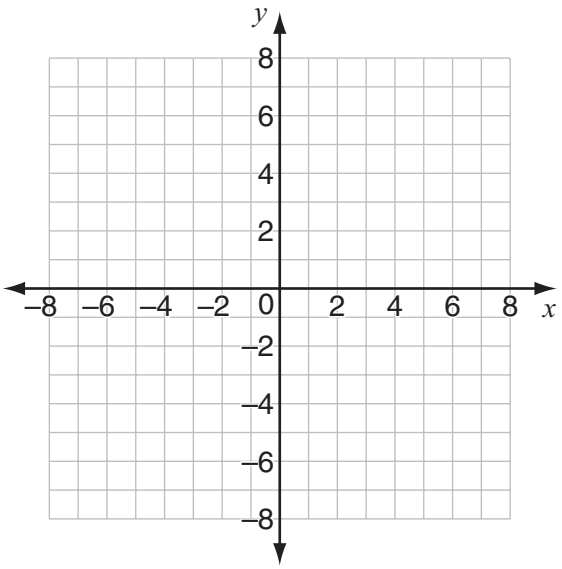
Answer Key: C

Portion of Standard Being Addressed
This item requires the student to describe the translation of figures in a coordinate plane.

25. You may use the grid below to answer the question.



Triangle *ELM* was transformed into triangle *E'L'M'*. The coordinates of the vertices of the triangles are shown below.

E (2, 4)	***E'*** (4, –1)
L (4, 5)	***L'*** (6, 0)
M (6, 3)	***M'*** (8, –2)

Which translation describes the relationship between the two triangles?

A. right 5, down 2
B. left 5, up 2
C. right 2, down 5
D. left 2, up 5

Multiple Choice Item 26

Standard: MA-07-3.3.1: Coordinate Geometry — Students will identify and graph ordered pairs on a coordinate system, correctly identifying the origin, axes and ordered pairs; and will apply graphing in the coordinate system to solve real-world and mathematical problems.

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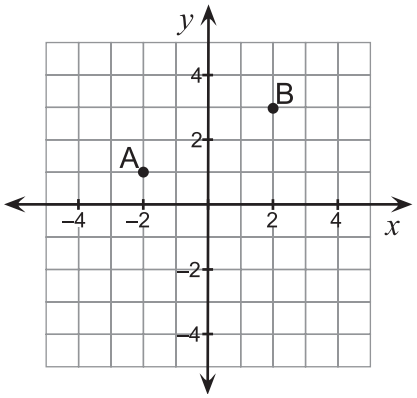
Answer Key: C

Portion of Standard Being Addressed
This item requires the student to apply graphing in the coordinate system to solve mathematical problems.

26. Use the graph below to answer the question.



Which location of point C will make triangle ABC isosceles?

A. (– 2, 3)
B. (– 2, 2)
C. (2,– 2)
D. (1, – 1)

Multiple Choice Item 27

Standard: MA-07-3.3.1: Coordinate Geometry — Students will identify and graph ordered pairs on a coordinate system, correctly identifying the origin, axes and ordered pairs; and will apply graphing in the coordinate system to solve real-world and mathematical problems.

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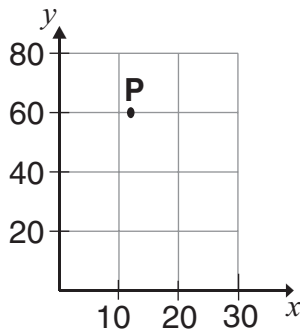
Answer Key: A

Portion of Standard Being Addressed
This item requires the student to identify ordered pairs on a coordinate system.

27. Look at the graph below.



Which of the following are the coordinates of point P?

A. (12,60)
B. (60,12)
C. (12,12)
D. (60,60)

Multiple Choice Item 28

Standard: MA-07-4.1.1: Representations of Data Sets — Students will analyze and make inferences from data displays (drawings, tables/charts, pictographs, bar graphs, circle graphs, line plots, Venn diagrams, line graphs, stem-and-leaf plots, scatter plots).

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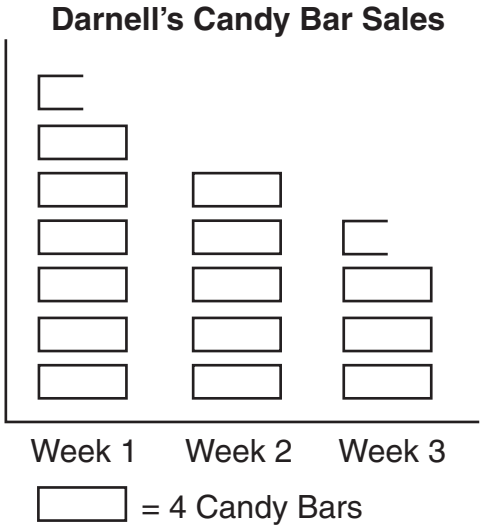
Answer Key: C

Portion of Standard Being Addressed
This item requires the student to make inferences from data displays.

28. Darnell is selling candy bars to raise money for his team. The pictograph below shows how many he sold the first three weeks.



If the pattern shown in the graph continues, how many candy bars will Darnell sell in Week 4?

A. 12 candy bars
B. 10 candy bars
C. 8 candy bars
D. 6 candy bars

Multiple Choice Item 29

Standard: MA-07-4.1.3: Representations of Data Sets — Students will read/interpret, analyze and make inferences from box and whisker plots of data and make predictions and draw conclusions from the data.

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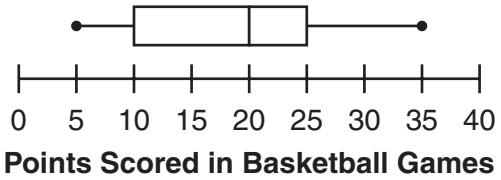
Answer Key: C

Portion of Standard Being Addressed
This item requires the student to read box and whisker plots of data.

29. The box-and-whisker plot below shows the distribution of Sam's points scored in his basketball games last season.



What is the range of the number of points scored?

A. 15
B. 20
C. 30
D. 35

Multiple Choice Item 30

Standard: MA-07-4.1.4: Representations of Data Sets — Students will determine and construct appropriate data displays (bar graphs, line plots, Venn diagrams, tables, line graphs, stem-and-leaf plots), and will explain why the type of display is appropriate for the data.

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Answer Key: A

Portion of Standard Being Addressed
This item requires the student to identify appropriate data displays.

30. The table below shows the average monthly temperatures for Tampa, Florida.

Tampa Temperatures

Month	Temperature
January	60
February	62
March	67
April	71
May	77
June	81
July	82
August	82
September	81
October	75
November	68
December	62

Which stem-and-leaf plot correctly displays these data?

A.

6	0 2 2 7 8
7	1 5 7
8	1 1 2 2

B.

6	0 2 7 8
7	1 5 7
8	1 2

C.

6	0
8 8 7	1
8 8 6 6	2
7	5
7 6	7
6	8

D.

6	0
8 7	1
8 6	2
7	5
7 6	7
6	8

Multiple Choice Item 31

Standard: MA-07-4.4.1: Probability — Students will apply counting techniques to determine the size of a sample space for a real-world or mathematical situation.

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Answer Key: A

Portion of Standard Being Addressed
This requires the student to calculate the total number of possible outcomes of an event.

31. Maria wants to travel from Casper to Atlanta. From Casper to Denver, she can choose one of three flights. From Denver to Atlanta, she has to choose one of four flights. How many different flight combinations could she have for her trip?

    A. 12
    B. 7
    C. 4
    D. 3

Multiple Choice Item 32

Standard: MA-07-4.4.2: Probability — Students will:

- determine theoretical probabilities of simple events;
- determine probabilities based on the results of an experiment and
- make inferences from probability data.

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Answer Key: C

Portion of Standard Being Addressed
This item requires the student to make inferences from probability data.

32. A bag has 5 marbles. Students took turns pulling a marble out of the bag, recording its color, and replacing it in the bag. The tally below shows the results.

Color	Number of times drawn
red	𝍸 𝍸 𝍸 II
blue	𝍸 𝍸 𝍸 𝍸
green	𝍸 𝍸 𝍸 𝍸 𝍸 𝍸 𝍸 IIII
yellow	𝍸 𝍸 𝍸 III

Which are **most likely** to be the colors of the 5 marbles in the bag?

A. 2 red, 1 blue, 1 green, and 1 yellow

B. 1 red, 2 blue, 1 green, and 1 yellow

C. 1 red, 1 blue, 2 green, and 1 yellow

D. 1 red, 1 blue, 1 green, and 2 yellow

Multiple Choice Item 33

Standard: MA-07-5.1.1: Patterns, Relations and Functions — Students will extend, describe rules for patterns and find a missing term in a pattern from real-world and mathematical problems.

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Answer Key: B

Portion of Standard Being Addressed
This item requires the student to describe rules for patterns in mathematical problems.

33. Use the table below to answer the question.

x	*y*
2700	3000
3600	4000
4500	5000
8100	9000

Which rule was used to change the numbers in column *x* to the numbers in column *y*?

A. divide by 0.09
B. divide by 0.9
C. divide by 9
D. divide by 90

Multiple Choice Item 34

Standard: MA-07-5.1.2: Patterns, Relations and Functions — Students will represent, analyze, and generalize first degree relationships using tables, graphs and words, and will apply the relationships to solve real-world and mathematical problems.

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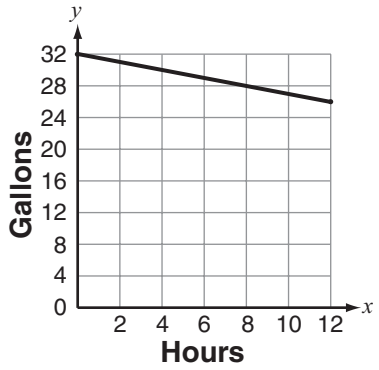
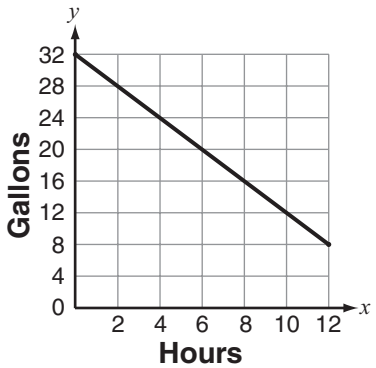
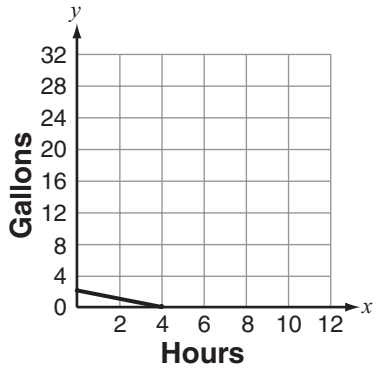
Answer Key: C

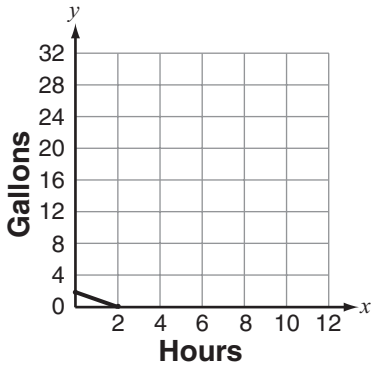
Portion of Standard Being Addressed
This item requires the student to identify the line on a coordinate grid that represents a real-world situation.

34. A 32-gallon tank leaks at the rate of 2 gallons per hour. If the tank starts out full, which graph correctly illustrates the amount of liquid in the tank over time?

A.


C.


B.


D.


Multiple Choice Item 35

Standard: MA-07-5.1.2: Patterns, Relations and Functions — Students will represent, analyze, and generalize first degree relationships using tables, graphs and words, and will apply the relationships to solve real-world and mathematical problems.

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Answer Key: D

Portion of Standard Being Addressed
This item requires the student to determine an output value for a function rule given an input value.

35. Look at the table below.

x	$3x - 2$
1	1
3	7
5	13
:	:
11	p

What is the value of p in the table?

A. 17
B. 19
C. 25
D. 31

Multiple Choice Item 36

Standard: MA-07-5.1.3: Patterns, Relations and Functions — Students will explain how tables, graphs, patterns, verbal rules and equations relate to each other.

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Answer Key: A

Portion of Standard Being Addressed
This item requires the student to explain how verbal rules and equations relate to each other.

36. The cost of printing greeting cards consists of a fixed charge of \$1.00 and a charge of \$0.06 for each card printed. Which equation can be used to determine the cost of printing n cards?

    A. cost = $1.00 + 0.06n$
    B. cost = $1.06 + n$
    C. cost = $0.06 + 1.00n$
    D. cost = $1.06n$

Multiple Choice Item 37

Standard: MA-07-5.2.1: Variables, Expressions and Operations — Students will substitute values for variables (up to three different variables) and evaluate algebraic expressions.

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Answer Key: B

Portion of Standard Being Addressed
This item requires the student to substitute values for variables and evaluate algebraic expressions.

37. Look at the expression below.

$$3ab^2$$

What is the value of the expression when $a = 4$ and $b = 5$?

A. 120
B. 300
C. 850
D. 1200

Multiple Choice Item 38

Standard: MA-07-5.2.2: Variables, Expressions and Operations — Students will describe, define and provide examples of variables and expressions with a missing value based on real-world and mathematical problems.

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Answer Key: D

Portion of Standard Being Addressed
This item requires the student to describe and define examples of variables based on real-world problems.

38. Ryan plans to save $25 each month to buy a new TV that costs $175. The equation below represents how he plans to save for the new TV.

$$\mathbf{25x = 175}$$

What does the variable x represent in the equation?

A. the total cost of Ryan's new TV
B. the amount of money Ryan saves each month
C. the number of years Ryan saves his money
D. the number of months Ryan saves his money

Multiple Choice Item 39

Standard: MA-07-5.3.1: Equations and Inequalities — Students will model and solve real-world and mathematical problems with one- or two-step single variable, first-degree equations or inequalities (e.g., $2x+1 = 9$, $3x+3 < 9$). (Statements and solutions use only non-negative numbers.)

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Answer Key: A

Portion of Standard Being Addressed
This item requires the student to solve mathematical problems with two-step single variable, first degree equations.

39. Solve for x:

$$\mathbf{2x + 1 = 29}$$

A. 14
B. 15
C. 28
D. 30