



**NEW ENGLAND
COMMON ASSESSMENT PROGRAM**

**Released Items
Support Materials
2011**

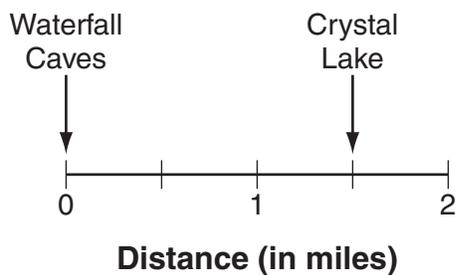
**Grade 6
Mathematics**

NECAP 2011 RELEASED ITEMS
GRADE 6 MATH

N&O 5.1 Demonstrates conceptual understanding of rational numbers with respect to: whole numbers from 0 to 9,999,999 through equivalency, composition, decomposition, or place value **using models, explanations, or other representations**; and positive fractional numbers (proper, mixed number, and improper) (halves, fourths, eighths, thirds, sixths, twelfths, fifths, or powers of ten (10, 100, 1000)), **decimals (to thousandths)**, or **benchmark percents (10%, 25%, 50%, 75% or 100%)** as a part to whole relationship in area, set, or linear models **using models, explanations, or other representations**.



1 Look at this number line.



Leslie is hiking from Waterfall Caves to Crystal Lake. How far will Leslie hike?

- A. $\frac{2}{3}$ mile
- B. $\frac{3}{4}$ mile
- C. $\frac{4}{3}$ miles
- D. $\frac{3}{2}$ miles

NECAP 2011 RELEASED ITEMS
GRADE 6 MATH

N&O 5.3 Demonstrates conceptual understanding of mathematical operations by describing or illustrating the meaning of a remainder with respect to division of whole numbers using models, explanations, or solving problems.

- 2 Some children are making puppets.
- Each puppet is made with 4 pieces of string.
 - Each piece of string must be 8 inches long.

What is the greatest number of puppets the children can make with a piece of string that is 120 inches long?

- A. 3
- B. 4
- C. 10
- D. 15

N&O 5.4 Accurately solves problems involving multiple operations on whole numbers or the use of the properties of factors, multiples, prime, or composite numbers; and addition or subtraction of fractions (proper) and decimals to the hundredths place. (Division of whole numbers by up to a two-digit divisor.) (IMPORTANT: *Applies the conventions of order of operations with and without parentheses.*)



- 3 Which number is a multiple of 24 **and** has 18 as a factor?
- A. 6
 - B. 24
 - C. 36
 - D. 72

NECAP 2011 RELEASED ITEMS
GRADE 6 MATH

G&M 5.1 Uses properties or attributes of angles (right, acute, or obtuse) or sides (number of congruent sides, parallelism, or perpendicularity) to **identify, describe, classify, or distinguish among different types of triangles** (right, acute, obtuse, equiangular, or equilateral) or **quadrilaterals** (rectangles, squares, rhombi, trapezoids, or parallelograms).

- 4 Triangle QRS has one obtuse angle. Which statement **must** also be true about triangle QRS ?
- A. Its sides are all different lengths.
 - B. Its other two angles are acute.
 - C. One of the remaining angles is acute and the other is obtuse.
 - D. Two of the sides are exactly the same length.

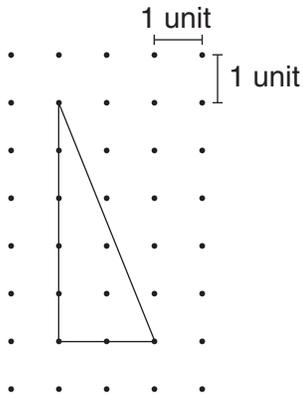
G&M 5.3 Uses properties or attributes (shape of bases, number of lateral faces, or number of bases) to **identify, compare, or describe three-dimensional shapes** (rectangular prisms, triangular prisms, cylinders, spheres, pyramids, or cones).

- 5 Which solid has parallel bases?
- A. a cone
 - B. a prism
 - C. a pyramid
 - D. a sphere

NECAP 2011 RELEASED ITEMS
GRADE 6 MATH

G&M 5.6 Demonstrates conceptual understanding of perimeter of polygons, and the area of rectangles or right triangles through models, manipulatives, or formulas, the area of polygons or irregular figures on grids, and volume of rectangular prisms (cubes) using a variety of models, manipulatives, or formulas. Expresses all measures using appropriate units.

6 Look at this triangle.



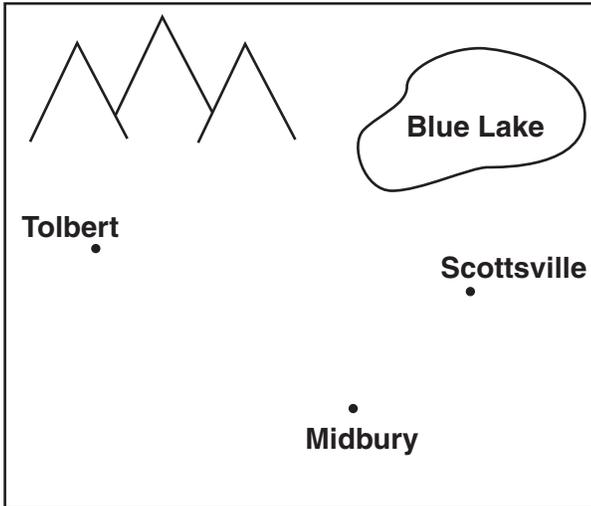
What is the area of the triangle?

- A. 4 square units
- B. 5 square units
- C. 7 square units
- D. 10 square units

NECAP 2011 RELEASED ITEMS
GRADE 6 MATH

G&M 5.7 Measures and uses units of measures appropriately and consistently, and makes conversions within systems when solving problems across the content strands.

7 Look at the map.



Scale
1 cm represents 15 km

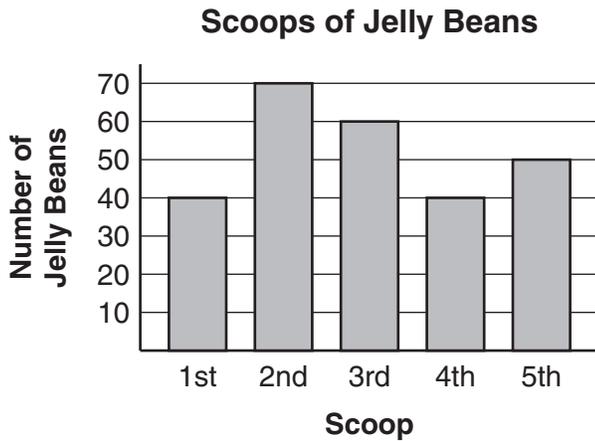
Use a ruler to answer this question. What is the distance from Tolbert to Scottsville?

- A. 75 km
- B. 60 km
- C. 15 km
- D. 5 km

NECAP 2011 RELEASED ITEMS
GRADE 6 MATH

DSP 5.1 Interprets a given representation (tables, bar graphs, circle graphs, or line graphs) to answer questions related to the data, to analyze the data to formulate or justify conclusions, to make predictions, or to solve problems. (IMPORTANT: *Analyzes data consistent with concepts and skills in M(DSP)-5-2.*)

- 8 Angela took 5 scoops of jelly beans from a jar. The bar graph below shows the number of jelly beans that were in each scoop.



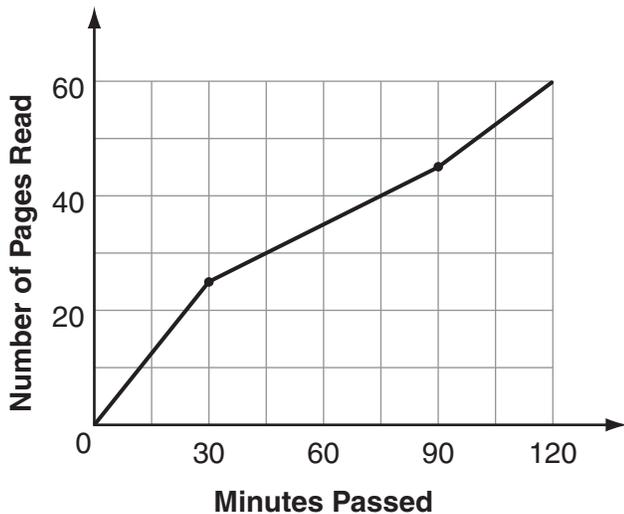
What is the mean number of jelly beans per scoop?

- A. 50
- B. 52
- C. 55
- D. 60

NECAP 2011 RELEASED ITEMS
GRADE 6 MATH

DSP 5.1 Interprets a given representation (tables, bar graphs, circle graphs, or line graphs) to answer questions related to the data, to analyze the data to formulate or justify conclusions, to make predictions, or to solve problems. (IMPORTANT: *Analyzes data consistent with concepts and skills in M(DSP)–5–2.*)

- 9 Henry read a 60-page book in 120 minutes. This graph shows the number of pages he read over time.



After how many minutes was Henry exactly halfway through the book?

- A. 35 minutes
- B. 45 minutes
- C. 60 minutes
- D. 75 minutes

NECAP 2011 RELEASED ITEMS
GRADE 6 MATH

DSP 5.5 For a probability event in which the sample space may or may not contain equally likely outcomes, determines the experimental or theoretical probability of an event and expresses the result as a fraction.



- 10 Jonah has a number cube with the faces numbered 1 through 6. Each face has exactly one number. He rolls the cube once. What is the probability that Jonah will roll a 3?

- A. $\frac{1}{6}$
- B. $\frac{1}{5}$
- C. $\frac{3}{6}$
- D. $\frac{3}{5}$

NECAP 2011 RELEASED ITEMS
GRADE 6 MATH

N&O 5.3 Demonstrates conceptual understanding of mathematical operations by describing or illustrating the meaning of a remainder with respect to division of whole numbers using models, explanations, or solving problems.



- 11 There are 380 students, teachers, and chaperones going on school buses for a field trip. Each school bus can hold 68 passengers. Everyone will ride on a school bus. How many school buses does this group need?

Scoring Guide:

Score	Description
1	for correct answer, 6
0	Response is incorrect or contains some correct work that is irrelevant to the skill or concept being measured.
Blank	No response

NECAP 2011 RELEASED ITEMS
GRADE 6 MATH

SCORE POINT 1
(EXAMPLE A)



11

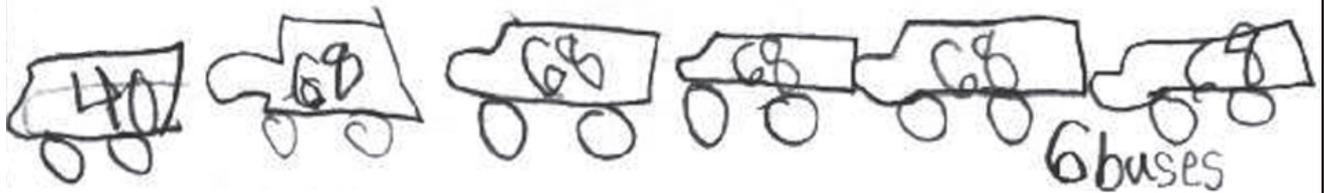
They will need 6 buses.

The student's answer is correct.

SCORE POINT 1
(EXAMPLE B)



11



The student's answer is correct. (Showing work is not required).

NECAP 2011 RELEASED ITEMS
GRADE 6 MATH

SCORE POINT 0
(EXAMPLE A)



11

$$\begin{array}{r} 68 \\ 68 \\ 68 \\ \hline 204 \end{array} \quad \begin{array}{r} 68 \\ 68 \\ 68 \\ \hline 204 \end{array}$$

$5\frac{1}{2}$ buses

The student's answer is incorrect.

SCORE POINT 0
(EXAMPLE B)



11

5 buses remainder 40

The student's answer is incorrect.

**NECAP 2011 RELEASED ITEMS
GRADE 6 MATH**

G&M 5.7 Measures and uses units of measures appropriately and consistently, and makes conversions within systems when solving problems across the content strands.

- 12 Daryl bought 3 pounds of cheese. He used 12 ounces of cheese to make a pizza. After he made the pizza, how much cheese was left? Label your answer with a unit of measure. [1 pound = 16 ounces]

Scoring Guide:

Score	Description
1	for correct answer, 2 pounds 4 ounces or equivalent
0	Response is incorrect or contains some correct work that is irrelevant to the skill or concept being measured.
Blank	No response

NECAP 2011 RELEASED ITEMS
GRADE 6 MATH

SCORE POINT 1
(EXAMPLE A)

12

2 lbs. 4 oz.

The student's answer is correct.

SCORE POINT 1
(EXAMPLE B)

12

There was 36 oz. left after making
the pizza.

The student's answer is correct.

SCORE POINT 0

12

$2\frac{4}{16} = 2\frac{1}{4}$ cheese left

The student's answer is incorrect. The response is not labeled with a correct unit of measure.

**NECAP 2011 RELEASED ITEMS
GRADE 6 MATH**

N&O 5.2 Demonstrates understanding of the relative magnitude of numbers by ordering, comparing, or identifying equivalent positive fractional numbers, decimals, or benchmark percents within number formats (fractions to fractions, decimals to decimals, or percents to percents); or integers in context using models or number lines.

13 Amy, Ben, and Cal ran for class president.

- Amy received $\frac{1}{3}$ of the votes.
- Ben received $\frac{1}{6}$ of the votes.
- Cal received the rest of the votes.

List the students in order from the most votes received to the least votes received. Show your work or explain how you know.

Scoring Guide:

Score	Description
2	for correct answer, Cal, Amy, Ben , with sufficient explanation or work shown to indicate correct strategy
1	for correct answer with insufficient or no explanation or work shown or for sufficient strategy with incorrect or no answer
0	Response is incorrect or contains some correct work that is irrelevant to the skill or concept being measured.
Blank	No response

NECAP 2011 RELEASED ITEMS
GRADE 6 MATH

SCORE POINT 2
(EXAMPLE A)

13

1. Cal
2. Amy
3. Ben

$$\frac{1}{3} = \frac{2}{6} \quad \frac{6}{6} - \frac{2}{6} - \frac{1}{6} = \frac{3}{6}$$

Amy gets $\frac{3}{6}$ of the votes and Ben gets $\frac{1}{6}$.
If Cal gets the rest that means he gets $\frac{2}{6}$.

The student's answer is correct, with sufficient explanation given.

SCORE POINT 2
(EXAMPLE B)

13

Amy:  = $\frac{1}{3}$ or $\frac{2}{6}$

Ben:  = $\frac{1}{6}$

Cal:  = $\frac{1}{2}$ or $\frac{3}{6}$

Cal, Amy, Ben

The student's answer is correct, with sufficient work shown to indicate correct strategy.

NECAP 2011 RELEASED ITEMS
GRADE 6 MATH

SCORE POINT 1

13

$\frac{1}{3} > \frac{1}{6}$ Cal should have a little more than half of the votes.

Cal, Amy and Ben

The student's answer is correct, with insufficient work shown to indicate correct strategy.

SCORE POINT 0

13

1 Ben $\frac{1}{6}$
2 Amy $\frac{1}{3}$
3 Cal

I did not know what Cal had so I put him last, $\frac{1}{6}$ is more ^{than} $\frac{1}{3}$.

The student's answer is incorrect, with insufficient work shown to indicate correct strategy.

**NECAP 2011 RELEASED ITEMS
GRADE 6 MATH**

N&O 5.4 **Accurately solves problems involving** multiple operations on whole numbers or the use of the properties of factors, multiples, prime, or composite numbers; and addition or subtraction of fractions (proper) and decimals to the hundredths place. (Division of whole numbers by up to a two-digit divisor.) (IMPORTANT: *Applies the conventions of order of operations with and without parentheses.*)



- 14** This table shows the prices for some items at a school store.

School Supplies

Item	Price
Notebook	\$1.99
Glue	\$2.48
Scissors	\$4.87
Tape	\$3.22
Computer paper	\$8.97

Zack bought 1 notebook, 1 pair of scissors, and 1 package of computer paper. He paid with a \$20 bill. How much change should Zack receive? Show your work or explain how you know.

Scoring Guide:

Score	Description
2	for correct answer (\$4.17 or equivalent monetary value , with sufficient explanation or work shown to indicate correct strategy
1	for correct answer with insufficient or no explanation or work shown or for appropriate strategy with incorrect or no answer
0	Response is incorrect or contains some correct work that is irrelevant to the skill or concept being measured.
Blank	No response

Sample Response:

$$1.99 + 4.87 + 8.97 = 15.83$$

$$20 - 15.83 = 4.17$$

Zack received \$4.17 in change.

NECAP 2011 RELEASED ITEMS
GRADE 6 MATH

SCORE POINT 2
(EXAMPLE A)

 14

1 Notebook	\$ ²² 1.99	\$ ¹⁹ 20.00	Zack received \$4.17 after he paid with a \$20 bill.
1 pair of scissors	4.87	\$15.83	
1 package of computer paper	<u>8.97</u>	<u>\$ 4.17</u>	
	\$15.83		

The student's answer is correct, with sufficient work shown.

SCORE POINT 2
(EXAMPLE B)

 14

1.99	He got back, 4 1 dollar bills, a dime, a nickel and 2 pennies.
4.87	
<u>+ 8.97</u>	
\$15.83	

The student's answer is correct, with sufficient work shown.

NECAP 2011 RELEASED ITEMS
GRADE 6 MATH

SCORE POINT 1



14

\$4.17¢

$$\begin{array}{r} 22 \\ \$1.99 \\ \$4.87 \\ \$8.97 \\ + \\ \hline \$15.83 \end{array} \quad \begin{array}{r} 199 \\ \cancel{\$20.00} \\ \hline \$15.83 \\ \hline \$4.17 \end{array}$$

The student's strategy is appropriate, with incorrect answer due to inconsistent labels.

SCORE POINT 0



14

a)

$$\begin{array}{r} 22 \\ 199 \\ 487 \\ + 897 \\ \hline \$15.63 \end{array}$$

He would receive 22¢.

The student's answer is incorrect, with insufficient work shown.

**NECAP 2011 RELEASED ITEMS
GRADE 6 MATH**

F&A 5.3 Demonstrates conceptual understanding of algebraic expressions by using letters to represent unknown quantities to write linear algebraic expressions involving any two of the four operations; or by evaluating linear algebraic expressions using whole numbers.

- 15 The table below shows the relationship between an animal's weight on Earth and what the animal's weight would be on the Moon.

Weight of Animal on Earth	Weight of Animal on the Moon
18 pounds	3 pounds
54 pounds	9 pounds
120 pounds	20 pounds
600 pounds	100 pounds

- a. Sheila's dog weighs 90 pounds on Earth. How many pounds would Sheila's dog weigh on the **Moon**? Show your work or explain how you know.
- b. Write a rule in words or symbols to find an animal's weight on the **Moon**, if the animal weighs p pounds on Earth.
- c. Jay's dog would weigh 12 pounds on the Moon. How much does Jay's dog weigh on **Earth**? Show your work or explain how you know.

**NECAP 2011 RELEASED ITEMS
GRADE 6 MATH**

Scoring Guide:

Score	Description
4	5 points
3	4 points
2	2 or 3 points
1	1 point
0	Response is incorrect or contains some correct work that is irrelevant to the skill or concept being measured.
Blank	No response

Training Notes:

Part a: 2 points for correct answer, **15** (pounds), with sufficient explanation or work shown to indicate correct strategy

OR

1 point for correct answer with insufficient or no explanation or work shown
or
for sufficient strategy with incorrect or no answer

Part b: 1 point for correct rule, **$p \div 6$** or **equivalent**

Part c: 2 points for correct answer, **72** (pounds), with sufficient explanation or work shown to indicate correct strategy

OR

1 point for correct answer with insufficient or no explanation or work shown
or
for sufficient strategy with incorrect or no answer

Note: Do not penalize for missing labels.

Sample Response:

Part a: $90 \div 6 = 15$

Part c: $p \div 6 = 12 \rightarrow p = 6 \times 12 = 72$

NECAP 2011 RELEASED ITEMS
GRADE 6 MATH

SCORE POINT 4
(EXAMPLE A)

15

A. $90 \div 6 = 15$

B. $M = P \div 6$

C. $12 \times 6 = 72$

The student's work is shown on three separate pieces of paper. In problem A, the number 15 is boxed. In problem B, the entire equation is boxed. In problem C, the number 72 is circled.

- a) The student's answer is correct, with sufficient work shown.
- b) The student's answer is correct.
- c) The student's answer is correct, with sufficient work shown.

NECAP 2011 RELEASED ITEMS
GRADE 6 MATH

SCORE POINT 4
(EXAMPLE B)

15

a.
$$\begin{array}{r} 15 \\ 6 \overline{) 90} \\ \underline{-6} \\ 30 \\ \underline{-30} \\ 0 \end{array}$$
 It would weigh 15 pounds on the Moon.

b. To find an animals weight on the Moon you subtract $\frac{5}{6}$ of their weight on Earth.

c.
$$\begin{array}{r} 12 \\ 6 \overline{) 72} \\ \underline{-6} \\ 12 \\ \underline{-12} \\ 0 \end{array}$$
 He weighs 72 pounds on Earth.

- a) The student's answer is correct, with sufficient work shown.
- b) The student's answer is correct.
- c) The student's answer is correct, with sufficient work shown.

NECAP 2011 RELEASED ITEMS
GRADE 6 MATH

SCORE POINT 3
(EXAMPLE A)

15

A

$$\begin{array}{r} 15 \text{ pounds} \\ 6 \overline{) 90} \\ \underline{90} \\ 0 \end{array}$$

B.

$$p = 6:M$$

C.

$$\begin{array}{r} 12 \\ \times 6 \\ \hline 72 \end{array} \quad 72 \text{ pounds}$$

- a) The student's answer is correct, with sufficient work shown.
- b) The student's answer is incorrect.
- c) The student's answer is correct, with sufficient work shown.

NECAP 2011 RELEASED ITEMS
GRADE 6 MATH

SCORE POINT 3
(EXAMPLE B)

15

15 because you divide the
A Earth's weight by 6 and it
gives you the moon

Key
E = Earth
M = moon

B $M = E \div 6$

C 7 ~~2~~ because you do the
opposite times ^{Earth} by six and
you will get the moon

- a) The student's answer is correct, with sufficient work shown.
- b) The student's answer is correct.
- c) The student's answer is correct, the explanation has an error.

NECAP 2011 RELEASED ITEMS
GRADE 6 MATH

SCORE POINT 2
(EXAMPLE A)

15

a. 15

b. 9 pounds on the moon
and 54 pounds on earth

c. 72

- a) The student's answer is correct, with insufficient work shown.
- b) The student's answer is incorrect.
- c) The student's answer is correct, with insufficient work shown.

SCORE POINT 2
(EXAMPLE B)

15

Sheila's dog would weigh 15 pounds on the moon.

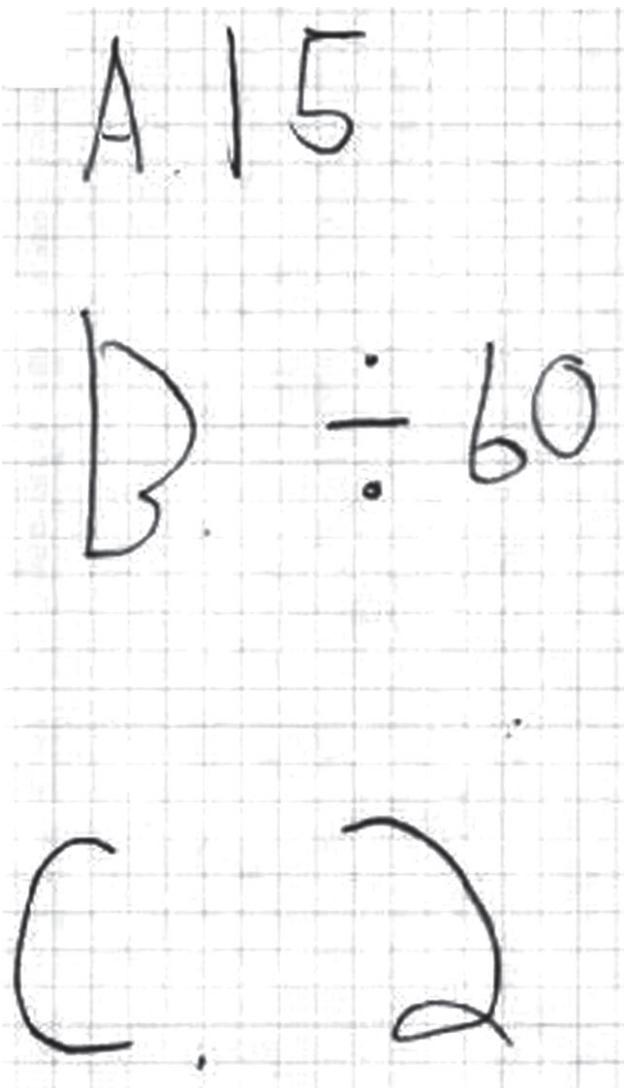
$$90 \div 6 = 15$$

- a) The student's answer is correct, with sufficient work shown.
- b) The student did not attempt.
- c) The student did not attempt.

NECAP 2011 RELEASED ITEMS
GRADE 6 MATH

SCORE POINT 1
(EXAMPLE A)

15



- a) The student's answer is correct, with no explanation or work shown.
- b) The student's answer is incorrect.
- c) The student's answer is incorrect, with no explanation or work shown.

NECAP 2011 RELEASED ITEMS
GRADE 6 MATH

SCORE POINT 1
(EXAMPLE B)

15

A 15 pounds because you have to find a middle number.

B you have to see how much you dog weighs and look and see how much now.

C 60 pounds because he wights is 12 pounds on the moon.

- a) The student's answer is correct, with incorrect explanation.
- b) The student's answer is incorrect.
- c) The student's answer is incorrect, with incorrect explanation.

NECAP 2011 RELEASED ITEMS
GRADE 6 MATH

SCORE POINT 0
(EXAMPLE A)

15

A. Zeropounds

$$\begin{array}{r} 500 - 400 \\ 100 - 45 \\ 45 - 30 \\ 15 - 15 \\ 0 = 0 \end{array}$$

←

B. If a animal wieghs 50 Pounds on earth he wieghs 5 Pounds on the moon.

C. 57 Pounds because

$$\begin{array}{r} 54 \text{ Pounds} \\ + 3 \text{ on earth} \\ \hline 57 \end{array}$$

$$\begin{array}{r} 9 \text{ Pounds} \\ + 3 \text{ on the} \\ \hline 12 \text{ Moon} \end{array}$$

- a) The student's answer is incorrect, with incorrect work shown.
- b) The student's answer is incorrect.
- c) The student's answer is incorrect, with incorrect work shown.

NECAP 2011 RELEASED ITEMS
GRADE 6 MATH

SCORE POINT 0
(EXAMPLE B)

15

a. 18

B. cant do it

C. $1\frac{1}{2}$ LB

- a) The student's answer is incorrect, with no explanation or work shown.
- b) The student's answer is incorrect.
- c) The student's answer is incorrect, with no explanation or work shown.

Grade 6 Mathematics Released Item Information – 2011

Released Item Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
No Tools Allowed	✓		✓							✓	✓			✓	
Content Strand ¹	NO	NO	NO	GM	GM	GM	GM	DP	DP	DP	NO	GM	NO	NO	FA
GLE Code	5-1	5-3	5-4	5-1	5-3	5-6	5-7	5-1	5-1	5-5	5-3	5-7	5-2	5-4	5-3
Depth of Knowledge Code	2	2	2	2	1	1	2	2	2	1	2	2	2	2	2
Item Type ²	MC	SA	SA	SA	SA	CR									
Answer Key	D	A	D	B	B	B	A	B	B	A					
Total Possible Points	1	1	1	1	1	1	1	1	1	1	1	1	2	2	4

¹Content Strand: NO = Numbers & Operations, GM = Geometry & Measurement, FA = Functions & Algebra, DP = Data, Statistics, & Probability

²Item Type: MC = Multiple Choice, SA = Short Answer, CR = Constructed Response