



**NEW ENGLAND  
COMMON ASSESSMENT PROGRAM**

**Released Items  
Support Materials  
2012**

**Grade 6  
Mathematics**

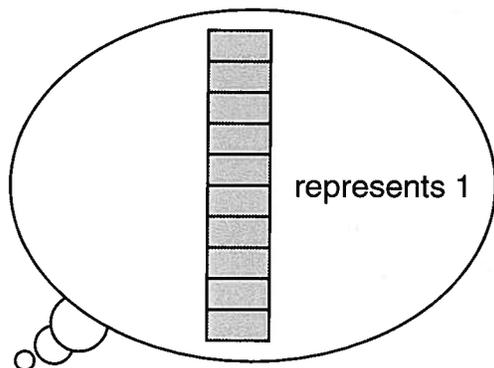
NECAP 2012 RELEASED ITEMS  
GRADE 6 MATH

**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**.



119311.001 119312 B Common, CMN

- 1 Maggie shaded part of this rectangle gray to represent a decimal.



What decimal did Maggie represent?

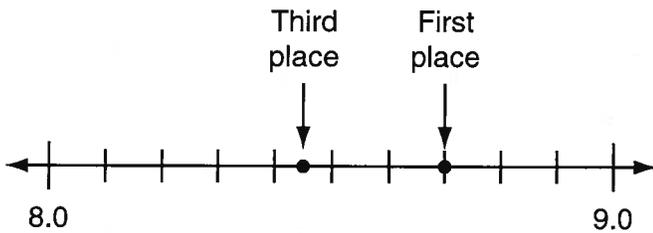
- A. 0.025
- B. 0.25
- C. 2.5
- D. 25.0

NECAP 2012 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.

145124.004 145125 D Common, CMN

- 2 This number line shows the scores the first-place winner and the third-place winner earned in a gymnastics event.



Which score could the **second-place** winner have earned in the event?

- A. 8.40
- B. 8.75
- C. 8.06
- D. 8.65

**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.

119283.001 C Common, CMN

- 3 One box of spaghetti serves 8 people. What is the **least** number of boxes needed to serve 90 people?

- A. 10
- B. 11
- C. 12
- D. 13

NECAP 2012 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.*)

119221.002 D Common, CMN

- 4 Hillary listed all the whole number factors of 18. Celeste listed all the whole number factors of 24. What factors are in both lists?
- A. 1, 3, 6, 8
  - B. 1, 3, 4, 6
  - C. 1, 2, 4, 6
  - D. 1, 2, 3, 6

**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).



139269.002 B Common, CMN

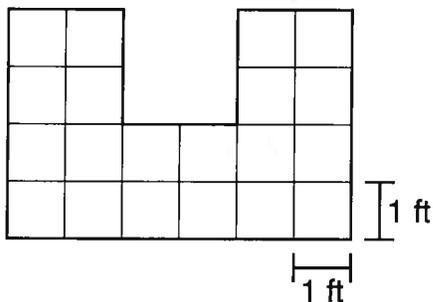
- 5 Which shape has **exactly** one base?
- A. rectangular prism
  - B. rectangular pyramid
  - C. sphere
  - D. cylinder

NECAP 2012 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.

125135.002 125136 D Common, CMN

6 Look at this figure.



What is the perimeter of the figure?

- A. 18 feet
- B. 20 feet
- C. 22 feet
- D. 24 feet

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GRADE 6 MATH

**F&A 5.1** Identifies and extends to specific cases a variety of patterns (linear and nonlinear) represented in models, tables, sequences, or in problem situations; and writes a rule in words or symbols for finding specific cases of a linear relationship.

119299.001 131247 C Common, CMN

**7** Look at this table.

**Calcium in Milk**

Number of Fluid Ounces	Amount of Calcium (in milligrams)
8	300
16	600
24	900
32	1200

Based on the table, how many **more** milligrams of calcium are in 12 fluid ounces of milk than in 8 fluid ounces of milk?

- A. 50
- B. 100
- C. 150
- D. 300

**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.

119377.003 C Common, CMN

**8** A bucket of popcorn costs \$6 and each soda costs \$3. Which expression represents the total cost of 2 buckets of popcorn and  $n$  sodas?

- A.  $6 + n + 3 + 2$
- B.  $3 + n + 6 \cdot 2$
- C.  $2 \cdot 6 + 3 \cdot n$
- D.  $2 \cdot 3 + 6 \cdot n$

**NECAP 2012 RELEASED ITEMS  
GRADE 6 MATH**

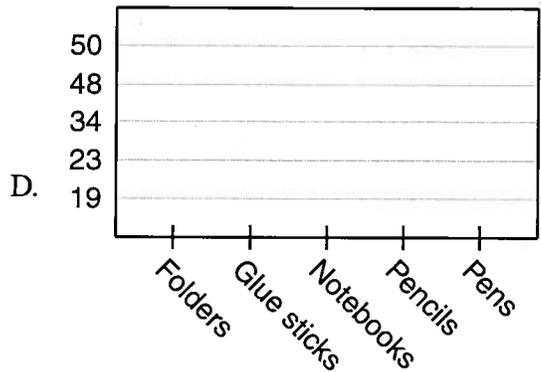
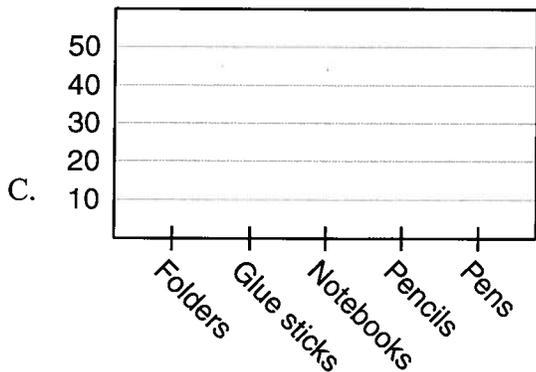
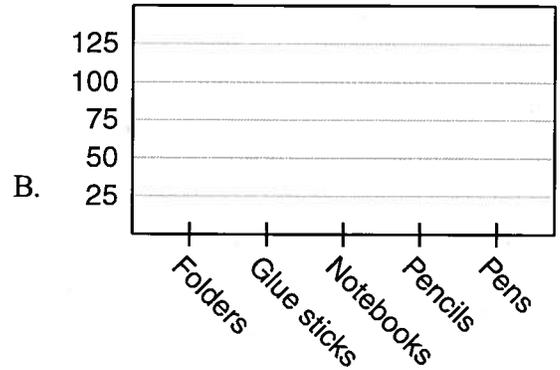
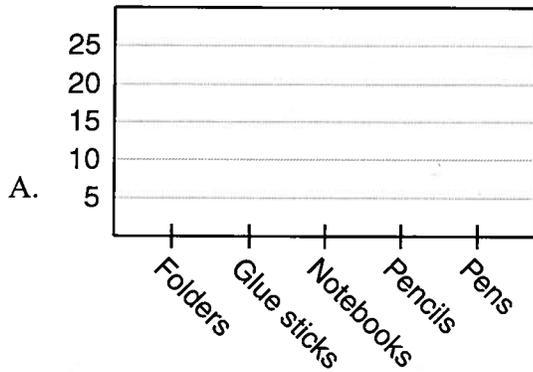
**DSP 5.3** Identifies or describes representations or elements of representations that best display a given set of data or situation, consistent with the representations required in DSP 5.1.

119393.002 119394 C Common, CMN

9 Richard is making a bar graph of the data in this table.

School Supply	Number Sold
Folders	19
Glue sticks	34
Notebooks	50
Pencils	48
Pens	23

Which scale is **best** for Richard to use in his bar graph?



**NECAP 2012 RELEASED ITEMS  
GRADE 6 MATH**

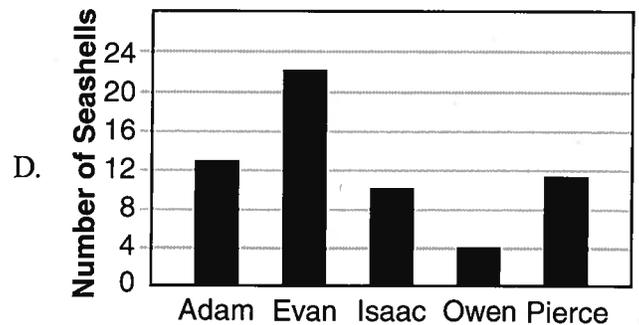
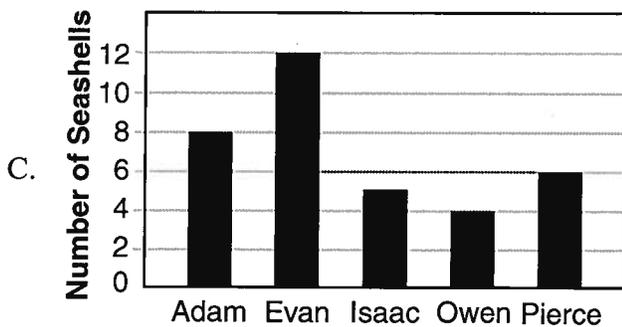
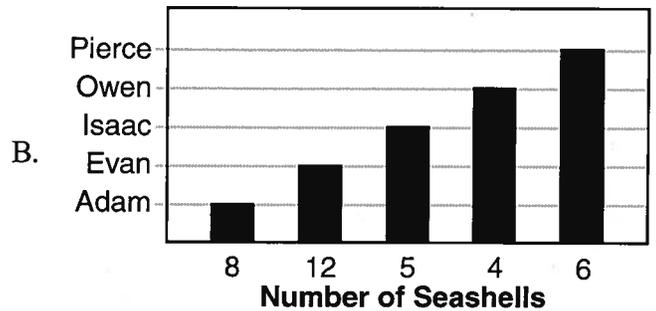
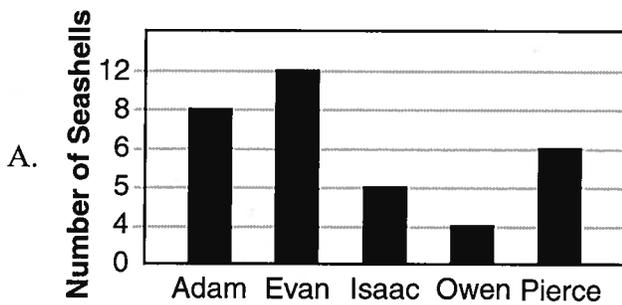
**DSP 5.3 Identifies or describes representations or elements of representations that best display a given set of data or situation, consistent with the representations required in DSP 5.1.**

145978.004 145979 C Common, CMN

- 10 Five brothers counted the number of seashells they each collected. The final tally is shown in the chart below.

Name of Brother	Number of Seashells
Adam	III
Evan	
Isaac	
Owen	
Pierce	I

The brothers want to compare the number of seashells they each collected. Which bar graph **best** represents the data?



NECAP 2012 RELEASED ITEMS  
GRADE 6 MATH

**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).

119263.001 119264 Common, CMN

11 Look at Figure P and Figure Q.

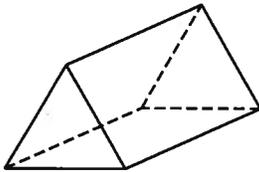


Figure P

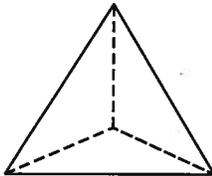


Figure Q

Describe **one** difference between Figure P and Figure Q. Use one or more of these words in your answer: bases, faces, edges, vertices.

**Scoring Guide:**

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

NECAP 2012 RELEASED ITEMS  
GRADE 6 MATH

SCORE POINT 1  
(EXAMPLE A)

11 A difference between P & Q is that all of Q's faces are triangular where figure P has triangles and rectangles

The student's response is correct.

SCORE POINT 1  
(EXAMPLE B)

11 Figure "P" has 3 more edges than figure "Q"

The student's response is correct.

SCORE POINT 0

11 The difference is the faces of the shapes.

The student's response is incorrect.

**NECAP 2012 RELEASED ITEMS  
GRADE 6 MATH**

**DSP 5.2** Analyzes patterns, trends, or distributions in data in a variety of contexts by determining or using measures of central tendency (mean, median, or mode) or range to analyze situations, or to solve problems.

139370.003 Common, CMN

**12** A football team scored the following numbers of points in last season's games.

**14, 7, 13, 6, 7, 20, 14, 10, 7, 3, 9**

What is the mode number of points scored?

**Scoring Guide:**

<b>Score</b>	<b>Description</b>
<b>1</b>	for correct answer, <b>7</b>
<b>0</b>	Response is incorrect or contains some correct work that is irrelevant to the skill or concept being measured.
<b>Blank</b>	No response

NECAP 2012 RELEASED ITEMS  
GRADE 6 MATH

SCORE POINT 1

12

7

The student's response is correct.

SCORE POINT 0

12

3, 6, 7, 7, 9, 10, 13, 14, 16, 20 9 is made.

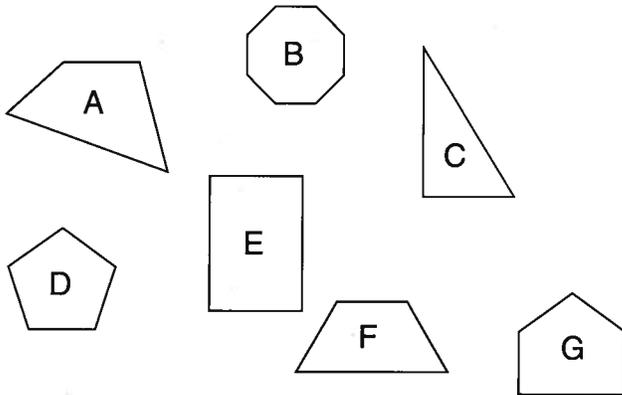
The student's response is incorrect.

**NECAP 2012 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).

119281.002 119282 Common, CMN

**13** Look at these seven shapes.



Sort the seven shapes into the following two groups.

- Group I must have shapes with no pairs of parallel sides.
- Group II must have shapes with at least one pair of parallel sides.

Label the groups “Group I” and “Group II.”

**Scoring Guide:**

Score	Description
<b>2</b>	for correctly sorting all seven shapes, <b>Group I: A, C, D</b> and <b>Group II: B, E, F, G</b>
<b>1</b>	for correctly sorting 5 or 6 shapes
<b>0</b>	Response is incorrect or contains some correct work that is irrelevant to the skill or concept being measured.
<b>Blank</b>	No response

NECAP 2012 RELEASED ITEMS  
GRADE 6 MATH

SCORE POINT 2  
(EXAMPLE A)

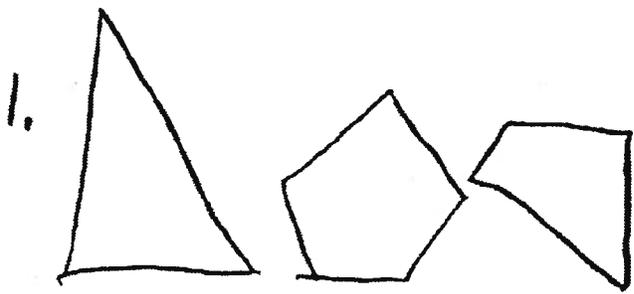
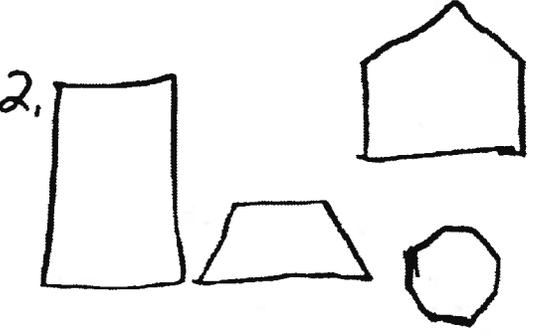
13

Group I A, C, D		Group II B, E, F, G
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The student's response is correct.

SCORE POINT 2  
(EXAMPLE B)

13

1. 		2. 
---	--	--

The student's response is correct.

SCORE POINT 1  
(EXAMPLE A)

13

group #1 A C		group #2 D E B G F
-----------------	--	-----------------------

The student correctly sorted 6 shapes.

NECAP 2012 RELEASED ITEMS  
GRADE 6 MATH

SCORE POINT 1  
(EXAMPLE B)

13 "Group I" = F C A  
"Group II" = E G D B

The student correctly sorted 5 shapes.

SCORE POINT 0  
(EXAMPLE A)

13 Group I  
A, B, C, D, F, G | Group II  
E

The student's response is incorrect.

SCORE POINT 0  
(EXAMPLE B)

13 Group I.  
E D B  
Group II.  
C F G A

The student's response is incorrect.

**NECAP 2012 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.

119203.002 Common, CMN

- 14** Janet is  $n$  years old. Megan is 4 years younger than Janet.
- a. Use  $n$  to write an expression to represent Megan's age.
  
  - b. When Megan is 18, how old will Janet be?

**Scoring Guide:**

Score	Description
<b>2</b>	for correct answer in part a, $n - 4$ , and in part b, <b>22</b>
<b>1</b>	for correct answer to part a OR for correct answer to part b
<b>0</b>	Response is incorrect or contains some correct work that is irrelevant to the skill or concept being measured.
<b>Blank</b>	No response

NECAP 2012 RELEASED ITEMS  
GRADE 6 MATH

SCORE POINT 2  
(EXAMPLE A)

14

$$n - 4$$

$$18 + 4 = 22$$

22 years old

The student's responses are correct.

SCORE POINT 2  
(EXAMPLE B)

14

A.  $n - 4 = \text{Megan's age}$

B. Janet will be 22 years old

The student's responses are correct.

NECAP 2012 RELEASED ITEMS  
GRADE 6 MATH

SCORE POINT 1  
(EXAMPLE A)

14 She is going to be 22 years old.

Part b: The student's response is correct.

Part a: The student did not attempt.

SCORE POINT 1  
(EXAMPLE B)

14 A  $N-4=M$  / B. 14 years old.

Part a: The student's response is correct.

Part b: The student's response is incorrect.

SCORE POINT 0

14 a.  $n+4 = \text{megans age.}$

B. 14

Part a: The student's response is incorrect.

Part b: The student's response is incorrect.

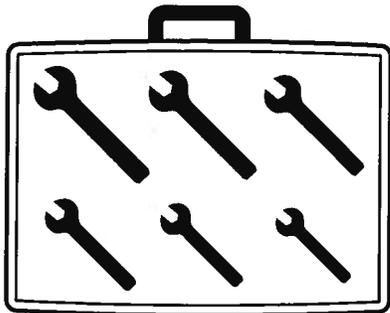
NECAP 2012 RELEASED ITEMS  
GRADE 6 MATH

**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.



167831.005 177080 Common, CMN

**15** David has this set of different-sized wrenches.



He takes out a wrench with a size of  $\frac{5}{8}$  inch and another wrench with a size of  $\frac{7}{16}$  inch.

a. Which of these two wrench sizes is larger? Show your work or explain how you know.

David needs a different wrench with a size between  $\frac{1}{4}$  inch and  $\frac{3}{8}$  inch.

b. What size wrench could David use? Write your answer as a fraction. Show your work or explain how you know.

David will put away the wrenches with the sizes listed below.

$\frac{3}{8}$  inch,  $\frac{7}{16}$  inch,  $\frac{13}{32}$  inch

c. What is the order of these wrench sizes from least to greatest? Show your work or explain how you know.

**NECAP 2012 RELEASED ITEMS  
GRADE 6 MATH**

**Scoring Guide:**

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

**NECAP 2012 RELEASED ITEMS  
GRADE 6 MATH**

**Training Notes:**

- Part a: 1 point for correct answer,  $\frac{5}{8}$ , with sufficient explanation or work shown to indicate correct strategy
- Part b: 2 points for correct answer, **any fraction between  $\frac{3}{8}$  and  $\frac{1}{4}$** , with sufficient explanation or work shown to indicate correct strategy

OR

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

- Part c: 2 points for correct answer,  $\frac{3}{8}$ ,  $\frac{13}{32}$ ,  $\frac{7}{16}$ , or **equivalent fractions** with sufficient explanation or work shown to indicate correct strategy

OR

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

Note: In part a, students do not receive any credit for an answer of  $\frac{5}{8}$  without any work or explanation.

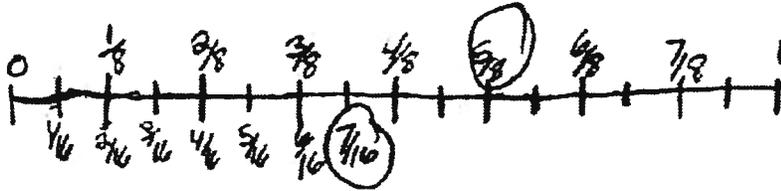
NECAP 2012 RELEASED ITEMS  
GRADE 6 MATH

SCORE POINT 4

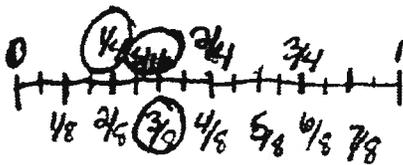
15

(A)  $\frac{5}{8}$  is larger

Part a: The student's response is correct, with sufficient work shown.



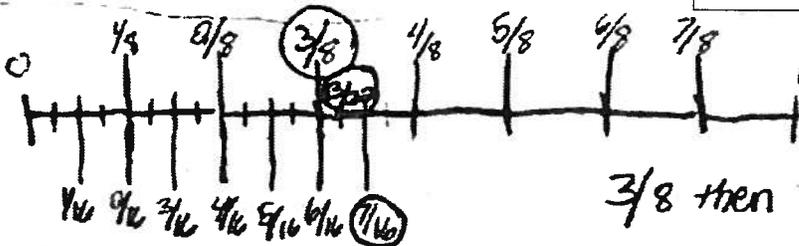
(B)



David could use  $\frac{5}{16}$

Part b: The student's response is correct, with sufficient work shown.

(C)



$\frac{3}{8}$  then  $\frac{13}{16}$  then  $\frac{7}{16}$

Part c: The student's response is correct, with sufficient work shown.

NECAP 2012 RELEASED ITEMS  
GRADE 6 MATH

SCORE POINT 3

15

$$a = \frac{5}{8}$$

Part a: The student's response is correct, without work shown or explanation given.

b =

$$\frac{1}{4} = \frac{2}{8} + \frac{2}{8} = \frac{4}{8} = \frac{1}{2}$$
$$\frac{1}{4} = \frac{2}{8} + \frac{1}{8} = \frac{3}{8}$$
$$\frac{1}{4} = \frac{2}{8} + \frac{1}{8} + \frac{1}{8} = \frac{4}{8} = \frac{1}{2}$$

$$\frac{5}{16}$$

Part b: The student's response is correct, with sufficient work shown.

$$c = \frac{3}{8} = \frac{12}{32} \quad \frac{7}{16} = \frac{14}{32}$$

$$\frac{3}{8}, \frac{13}{32}, \frac{7}{16}$$

Part c: The student's response is correct, with sufficient work shown.

NECAP 2012 RELEASED ITEMS  
GRADE 6 MATH

SCORE POINT 2

15

a.  $\frac{5}{8} = \frac{10}{16}$   
 $\frac{1}{16} = \frac{1}{16}$

$\frac{5}{8}$

Part a: The student's response is correct with sufficient work shown.

b.

$\frac{3}{8} = \frac{3}{8}$   
 $\frac{1}{4} = \frac{2}{8}$   
 $\frac{3}{8} - \frac{2}{8} = \frac{1}{8}$

$\frac{1}{8}$

Part b: The student's response is incorrect, with incorrect strategy.

c.

$\frac{3}{8} = \frac{12}{32}$   
 $\frac{1}{16} = \frac{2}{32}$   
 $\frac{13}{32} = \frac{13}{32}$

$\frac{3}{8}, \frac{13}{32}, \frac{7}{16}$

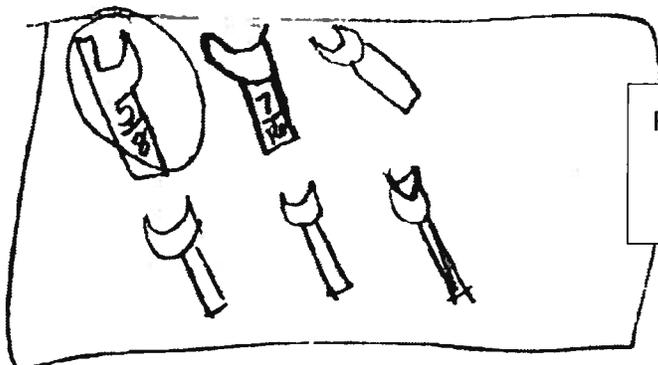
Part c: The student's response is correct, with sufficient work shown.

NECAP 2012 RELEASED ITEMS  
GRADE 6 MATH

SCORE POINT 1

15

A



Part a: The student's response is correct, without work shown or explanation given.

B

$$\frac{2}{6}$$

Part b: The student's response is correct, without work shown or explanation given.

C

$$\frac{13}{32} \quad \frac{7}{16} \quad \frac{3}{8}$$

Part c: The student's response is incorrect, with no explanation or work shown.

NECAP 2012 RELEASED ITEMS  
GRADE 6 MATH

SCORE POINT 0

15

$$A. \frac{5}{8} = 1\frac{3}{5}$$

$$\frac{7}{16} = 2\frac{2}{7}$$

$\frac{7}{16}$  is bigger

Part a: The student's response is incorrect.

B.  $\frac{3}{4}$

Part b: The student's response is incorrect, without work shown or explanation given.

$$C. \frac{3}{8} = 2\frac{2}{3} \quad \frac{13}{32} = 2\frac{4}{13}$$

$\frac{13}{32}, \frac{3}{8}, \frac{7}{16}$

Part c: The student's response is incorrect.

## Grade 6 Mathematics Released Item Information – 2012

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

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

<sup>2</sup>Item Type: MC = Multiple Choice, SA = Short Answer, CR = Constructed Response