New England Common Assessment Program

Released Items Support Materials 2013

Grade 5 Mathematics

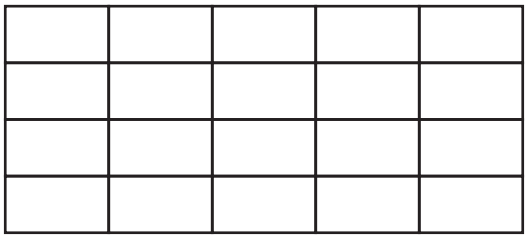
N&O 4.1 **Demonstrates conceptual understanding of rational numbers with respect to: whole numbers** from 0 to 999,999 through equivalency, composition, decomposition, or place value **using models, explanations, or other representations**; and **positive fractional numbers** (benchmark fractions: $a/2$, $a/3$, $a/4$, $a/5$, $a/6$, $a/8$, or $a/10$, where a is a whole number greater than 0 and less than or equal to the denominator) as a part to whole relationship in area, set, or linear models where the number of parts in the whole are equal to, and a multiple or factor of the denominator; and **decimals** as hundredths within the context of money, or tenths within the context of metric measurements (e.g., 2.3 cm) **using models, explanations, or other representations**.

1 What number is 15 tens less than 17,500?

A. 2,500
B. 16,000
C. 17,350
D. 17,485

N&O 4.2 **Demonstrates understanding of the relative magnitude of numbers** from 0 to 999,999 by ordering or comparing whole numbers; and ordering, comparing, or identifying equivalent proper positive fractional numbers; or decimals using models, number lines, or explanations

2 This drawing represents a chocolate bar that Lindsay, Dan, and Sean shared.



- Lindsay ate $\frac{1}{5}$ of the chocolate bar.
- Dan ate $\frac{3}{20}$ of the chocolate bar.
- Sean ate $\frac{5}{10}$ of the chocolate bar.

Which list shows the students in order from who ate the least to who ate the most of the chocolate bar?

A. Dan, Lindsay, Sean
B. Dan, Sean, Lindsay
C. Lindsay, Sean, Dan
D. Lindsay, Dan, Sean

N&O 4.4 **Accurately solves problems involving** multiple operations on whole numbers or the use of the properties of factors and multiples; and addition or subtraction of decimals and positive proper fractions with like denominators. (Multiplication limited to 2 digits by 2 digits, and division limited to 1 digit divisors.) (IMPORTANT: *Applies the conventions of order of operations where the left to right computations are modified only by the use of parentheses*.)

3 Mr. Taylor's garden has only pepper plants. His garden has 5 rows with 12 plants in each row. There are twice as many red pepper plants as green pepper plants. How many **red** pepper plants are in Mr. Taylor's garden?

A. 60

B. 40

C. 30

D. 15

G&M 4.1 **Uses properties or attributes of angles** (number of angles) **or sides** (number of sides, length of sides, parallelism, or perpendicularity) **to identify, describe, or distinguish among** triangles, squares, rectangles, rhombi, trapezoids, hexagons, or octagons; or classify angles relative to 90° as more than, less than, or equal to.

4 Harry gave these clues to describe his mystery shape.

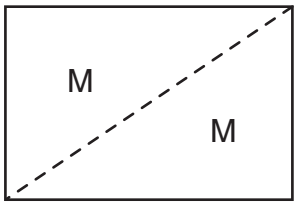
- It has four sides.
- Its opposite sides have the same length.
- Two of its angles are **more than** 90°.

What is Harry's mystery shape?

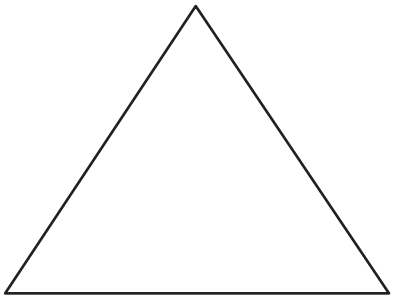
A. rhombus
B. hexagon
C. square
D. rectangle

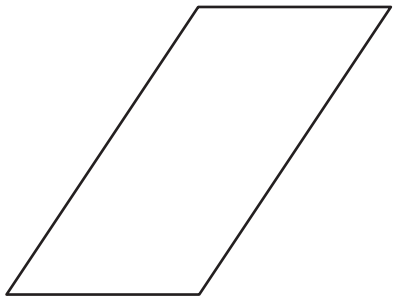
G&M 4.4 **Demonstrates conceptual understanding of congruency** by matching congruent figures using reflections, translations, or rotations (flips, slides, or turns), or as the result of composing or decomposing shapes using models or explanations.

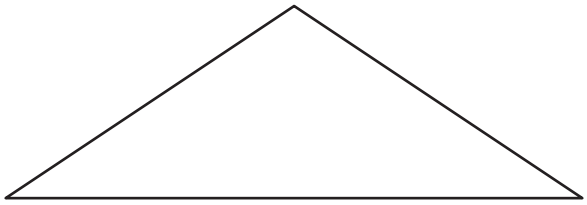
5 Juan cut this rectangle into two triangles.

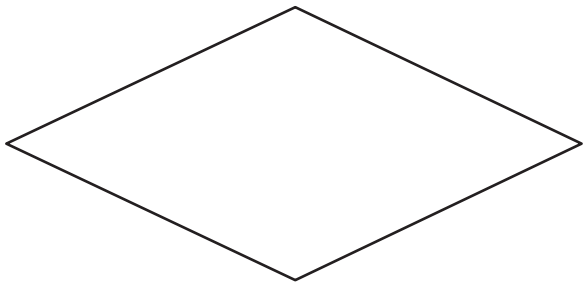


Juan uses the two triangles to make new shapes so that the triangles fit together with no gaps or overlaps. Which shape can Juan **not** make with the two triangles?

A. 

B. 

C. 

D. 

F&A 4.1 **Identifies and extends to specific cases a variety of patterns** (linear and nonlinear) represented in models, tables or sequences; and writes a rule in words or symbols to find the next case.

6 Look at this pattern.

_?_, _?_, 12, 17, 16, 21, 20, 25, 24

What are the first two numbers in the pattern?

A. 8, 7
B. 8, 13
C. 16, 11
D. 18, 13

F&A 4.3 **Demonstrates conceptual understanding of algebraic expressions** by using letters or symbols to represent unknown quantities to write simple linear algebraic expressions involving any one of the four operations; or by evaluating simple linear algebraic expressions using whole numbers.

7 Mr. Wheeler will burn $12 \times m$ calories if he runs for m minutes. How many calories will Mr. Wheeler burn if he runs for 40 minutes?

A. 48
B. 52
C. 160
D. 480

F&A 4.4 **Demonstrates conceptual understanding of equality** by showing equivalence between two expressions using models or different representations of the expressions, by simplifying numerical expressions where left to right computations may be modified only by the use of parentheses [e.g., 14–(2×5)] (expressions consistent with the parameters of M(F&A)–4–3), and by solving one-step linear equations of the form $ax=c$, $x \pm b=c$, where a, b, and c are whole numbers with $a \neq 0$.

8 Look at this number sentence.

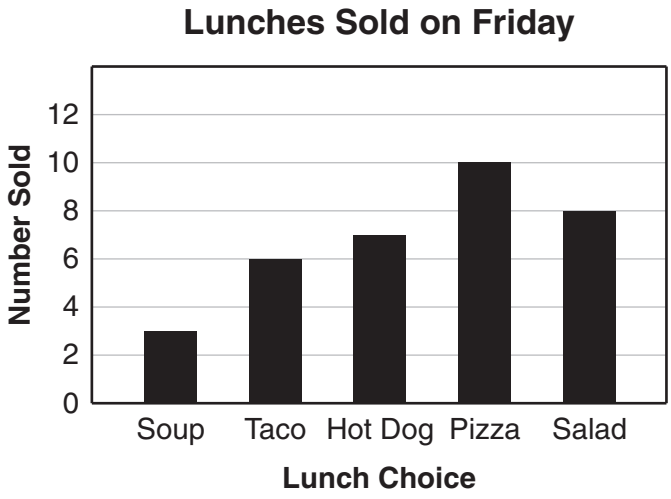
$$9 + 3 = \square + 5$$

What is the value of $\square$?

A. 3
B. 7
C. 12
D. 17

DSP 4.1 **Interprets a given representation** (line plots, tables, bar graphs, pictographs, or circle graphs) to answer questions related to the data, to analyze the data to formulate or justify conclusions, to make predictions, or to solve problems.

9 This bar graph shows the numbers of different lunches sold on Friday.



The number of pizza lunches sold was the same as the number of which two lunch choices added together?

A. soup and hot dog
B. soup and salad
C. taco and hot dog
D. taco and salad

DSP 4.2 **Analyzes patterns, trends, or distributions in data in a variety of contexts by determining or using** measures of central tendency (median or mode), or range.

10 This table shows the number of museum tickets sold each day for five days last week.

Museum Tickets

Day	Number of Tickets Sold
Monday	138
Tuesday	280
Wednesday	547
Thursday	690
Friday	279

What is the range of the number of tickets sold on the five days?

A. 552

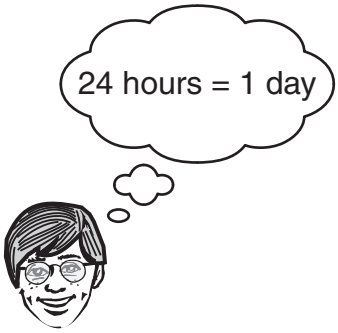
B. 547

C. 280

D. 141

G&M 4.7 Measures and uses units of measures appropriately and consistently, and make conversions within systems when solving problems across the content strands.

11 Isaac will leave to visit a friend in 120 hours. How long, in days, is 120 hours?



Scoring Guide:

Score	Description
1	for correct answer, **5** (days)
0	Response is incorrect or contains some correct work that is irrelevant to the skill or concept being measured.
Blank	No response

Score Point 1
(Example A)

11

5

The student's response is correct.

Score Point 1
(Example B)

11

24 x 5 = 120

Isaac will leave in 5 days.

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

Score Point 0

11

It would take four days

24
24
98
24
72
24
96

24/100

The student's response is incorrect.

F&A 4.3 **Demonstrates conceptual understanding of algebraic expressions** by using letters or symbols to represent unknown quantities to write simple linear algebraic expressions involving any one of the four operations; or by evaluating simple linear algebraic expressions using whole numbers.

⓬ Each stool in an art room has 3 legs. Write an expression that represents the total number of legs on n stools. Be sure to use n in your expression.

Scoring Guide:

Score	Description
1	for correct expression, $\mathbf{3 \times n}$ or **equivalent**
0	Response is incorrect or contains some correct work that is irrelevant to the skill or concept being measured.
Blank	No response

Score Point 1
(Example A)

⓬

3n

The student's response is correct.

Score Point 1
(Example B)

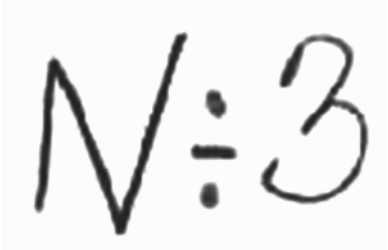
⓬

nx3

The student's response is correct.

Score Point 0
(Example A)

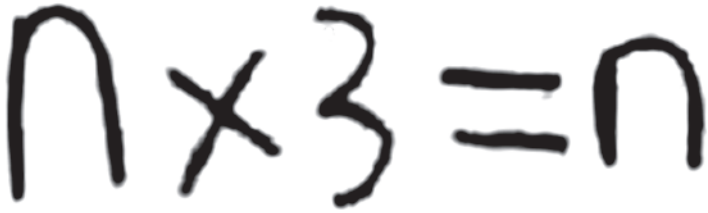
⓬



The student's response is incorrect.

Score Point 0
(Example B)

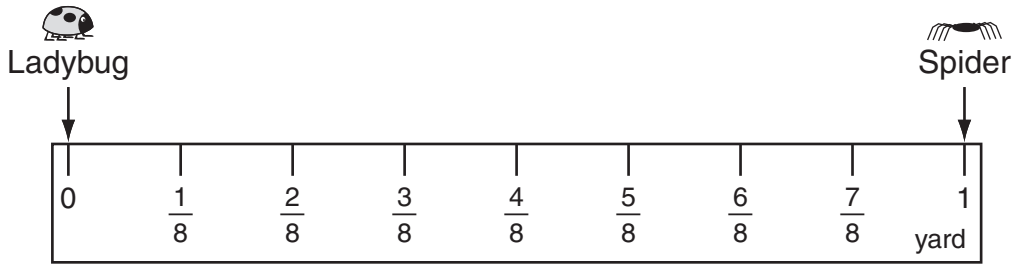
⓬



The student's response is incorrect.

N&O 4.3 **Demonstrates conceptual understanding of mathematical operations** by describing or illustrating the relationship between repeated subtraction and division (no remainders); the inverse relationship between multiplication and division of whole numbers; or the addition or subtraction of positive fractional numbers with like denominators using models, number lines, or explanations.

13 This picture shows a ladybug standing on one end of a yardstick and a spider standing on the other end.



The ladybug and the spider each walk $\frac{3}{8}$ of a yard toward the center of the yardstick and then stop. What is the distance between the ladybug and the spider when they stop? Show your work or explain how you know.

Scoring Guide:

Score	Description
2	for correct answer, $\frac{2}{8}$ (yards) or **equivalent**, 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

Score Point 2
(Example A)

13

$$\frac{5}{8} - \frac{3}{8} = \frac{2}{8}$$

$$\frac{2}{8}$$

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

Score Point 2
(Example B)

13

2/8 is the distance between the spider and ladybug becaus, they each walked 3/8 tword the center so thats 6/8 and + 2/8 = 8/8 and thy is the distance of the yard stick.

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

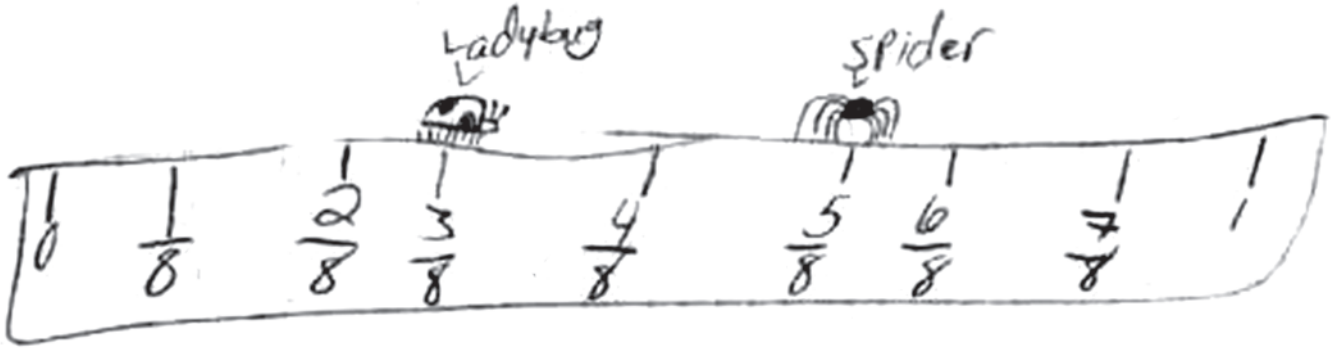
Score Point 2
(Example C)

13

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

Score Point 1
(Example A)

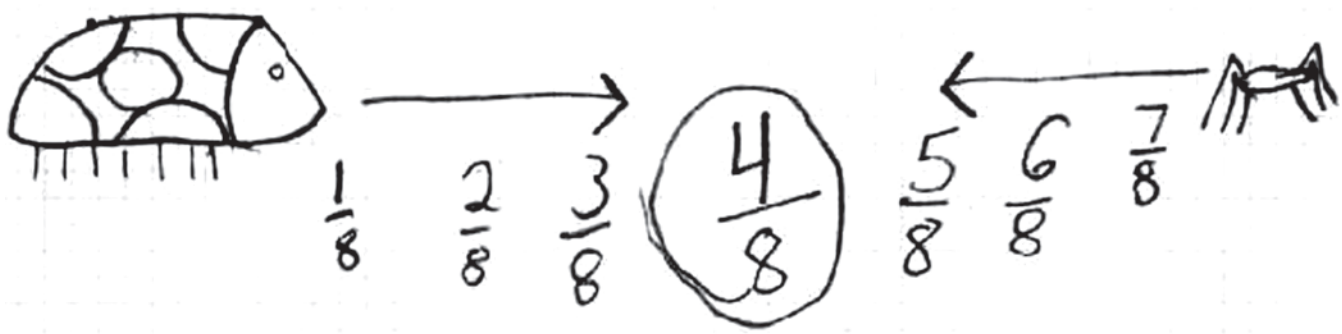
13



The student's strategy is appropriate with no answer given.

Score Point 1
(Example B)

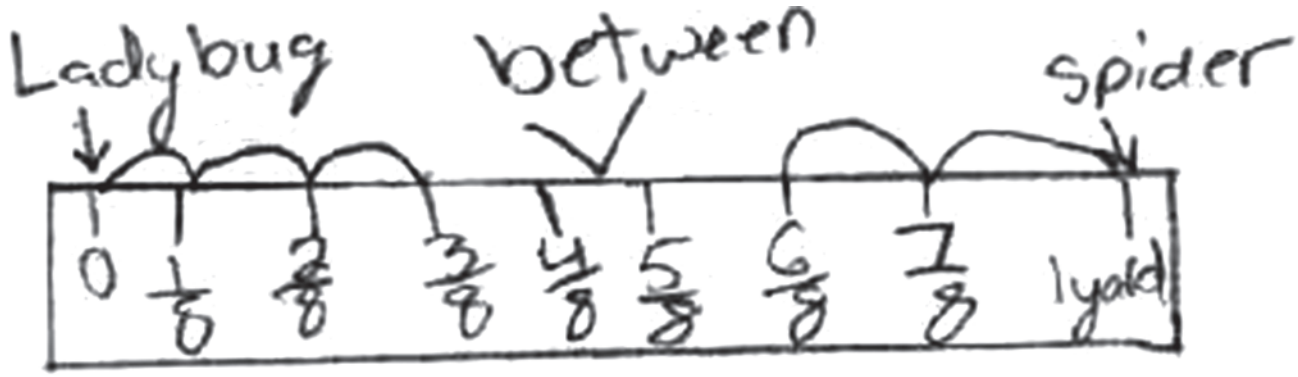
13



The student's strategy is appropriate with incorrect answer.

Score Point 0

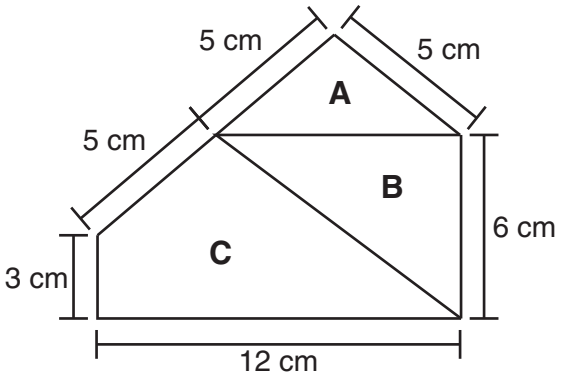
13



The student's strategy is insufficient, with no answer given.

G&M 4.6 Demonstrates conceptual understanding of perimeter of polygons, and **the area of** rectangles, polygons or irregular shapes on grids using a variety of models, manipulatives, or formulas. Expresses all measures using appropriate units.

14 The figure below is not drawn to scale.



Shape A has a perimeter of 18 centimeters. Shape C has a perimeter of 30 centimeters. What is the perimeter, in centimeters, of Shape B? Show your work or explain how you know.

Scoring Guide:

Score	Description
2	for correct answer, **24** (cm), 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

Score Point 2
(Example A)

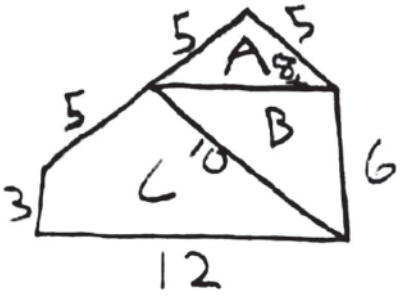
14

For shape C there's 12, 3 and 5. So there has to be 10 cm. on the other side because 12+3+5+10=30cm. For shape A theirs 5 and 5 The other side has to be 8 because 5+5+8=18 In shape B there's 6, 10 and 8. 6+10+8=24 The perimeter is 24.

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

Score Point 2
(Example B)

14



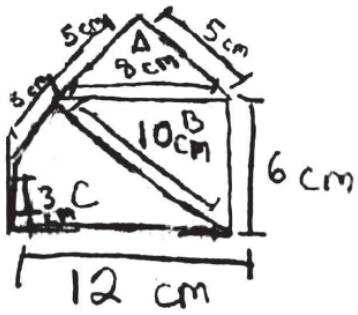
Shape b must be 24 centimeters.

$$\begin{array}{r} {}^{1}10 \\ 8 \\ +\ 6 \\ \hline 24 \end{array}$$

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

Score Point 1
(Example A)

14



I knew that 5 cm+3cm+12cm is 20 cm but there was an uncharted line so I subtracted 20cm from 30 cm and got 10cm The length of the uncharted line is 10 cm.

The student's response is incorrect, with sufficient explanation to indicate correct strategy.

Score Point 1
(Example B)

14

it is 24 because you find the missing numbers then you Add them up.

The student's response is correct, with insufficient explanation given.

Score Point 0

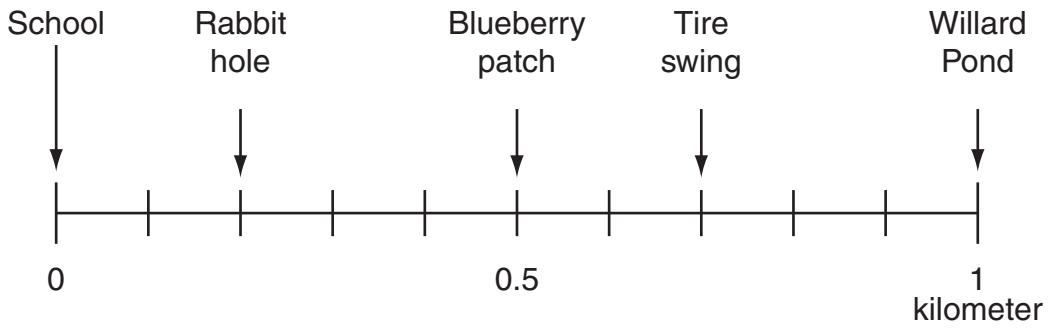
14

Sit it says so

The student's response is incorrect, with insufficient explanation given.

N&O 4.4 **Accurately solves problems involving** multiple operations on whole numbers or the use of the properties of factors and multiples; and addition or subtraction of decimals and positive proper fractions with like denominators. (Multiplication limited to 2 digits by 2 digits, and division limited to 1 digit divisors.) (IMPORTANT: *Applies the conventions of order of operations where the left to right computations are modified only by the use of parentheses.*)

15 This number line shows different places that Evan and Natalie can visit along a 1-kilometer trail from the school to Willard Pond.



a. What is the distance from the rabbit hole to the tire swing?

b. Evan walked from the school to the tire swing and then from the tire swing to the blueberry patch. What is the total distance Evan walked? Show your work or explain how you know.

c. Natalie walked a total distance of 0.8 kilometer. She started at the school and ended at the rabbit hole. What other place did Natalie visit? Show your work or explain how you know.

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: 1 point for correct answer, **0.5** (kilometer)

Part b: 2 points for correct answer, **0.9** (kilometer), 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 c: 2 points for correct answer, **blueberry patch**, 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

Score Point 4
(Example A)

15

A. The distance is 0.5 of a kilometer.

Part a: The student's response is correct.

B. The answer is 0.9 because he walked 0.7 to the Tire swing and then to the blueberry patch was another 0.2 so I added them and I got 0.9.

Part b: The student's response is correct, with sufficient explanation given.

C. She went to the Blueberry patch and then to the Rabitt hole. From the school the Blueberry Patch is 0.5 and then to the rabbit hole is 0.3 so I add that up and I got 0.8.

Part c: The student's response is correct, with sufficient explanation given.

Score Point 4
(Example B)

15

A. 0.5 kilometer

Part a: The student's response is correct.

b. 0.7
+ 0.2
0.9

0.9 kilometer

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

c. ~~0.8~~
~~− 0.2~~
~~0.6~~

= Blueberry Patch

School to Blueberry Patch = 0.5

Blueberry patch to Rabbit hole = 0.3

0.3 + 0.5 = 0.8

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

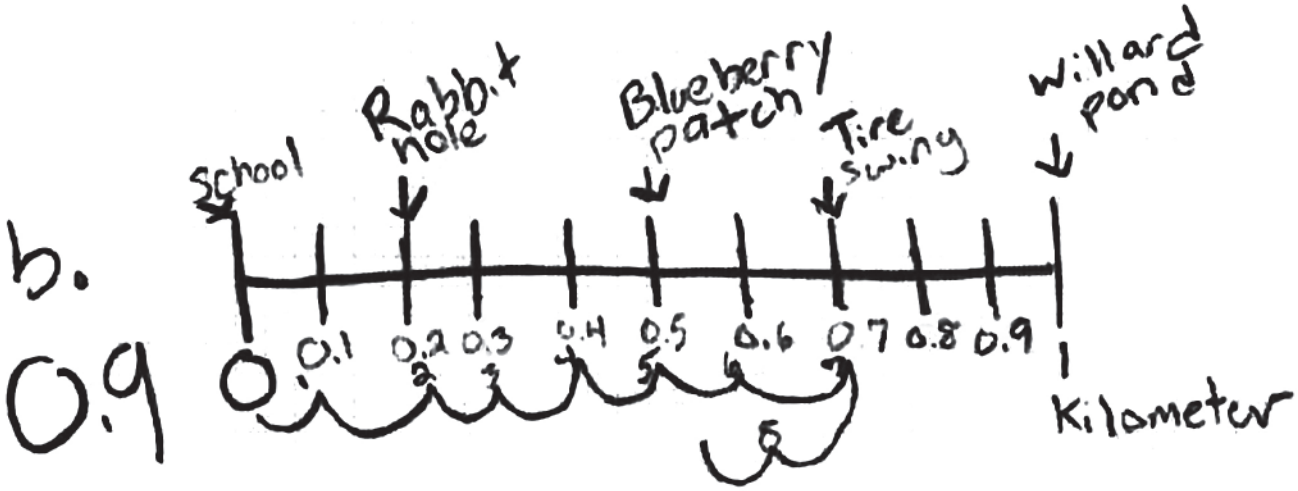
Score Point 3

15

A. 0.6

Part a: The student's response is incorrect.

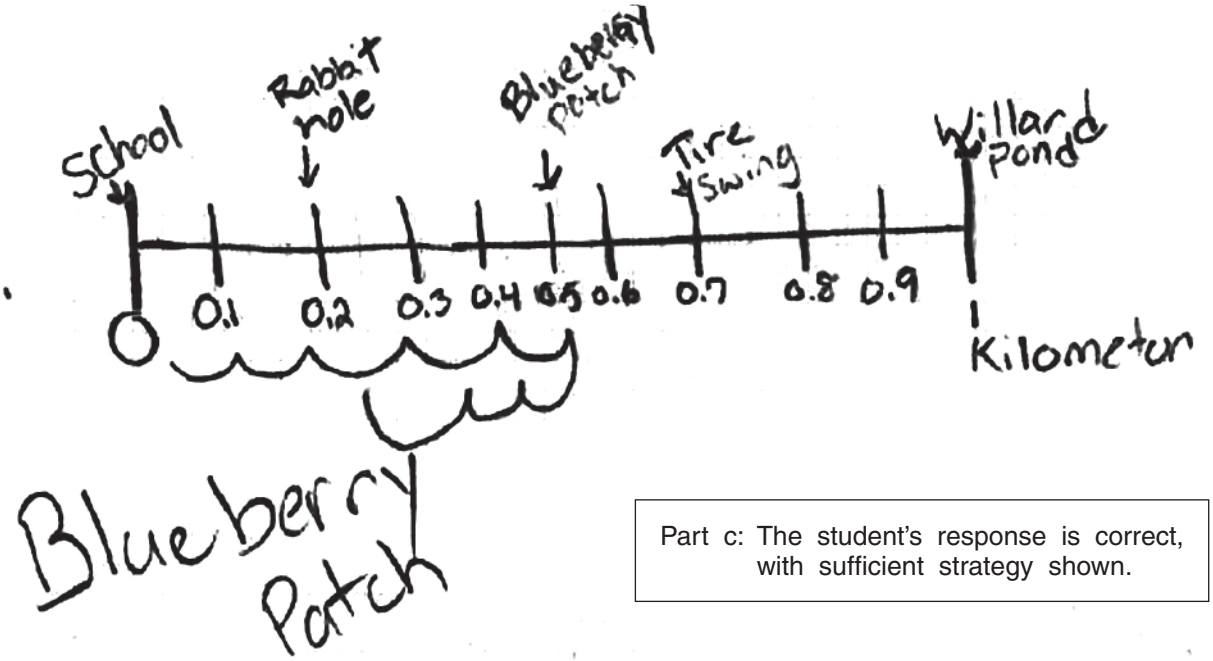
b.



0.9

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

c.



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

Score Point 2
(Example A)

15

A. 0.6 kilometers

Part a: The student's response is incorrect.

B. 0.9 kilomiters

Part b: The student's response is correct, with no work shown or explanation given.

C. Blue berry Patch

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

Score Point 2
(Example B)

15

(A) 0.5 is the difference from the rabbit hole to the tire swing.

Part a: The student's response is correct.

(B.) He walked 0.9 Kilometers

0+0.7+0.2=0.9 Kilometers

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

(C.) She went to (unit) one Killometer after the tire swing.

0.8-0.2=0.6+0.2= one more after the tire swing.

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

Score Point 1
(Example A)

15

a. 50 metres

Part a: The student's response is incorrect.

b. 70 metres

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

c. Blueberry Patch

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

Score Point 1
(Example B)

15

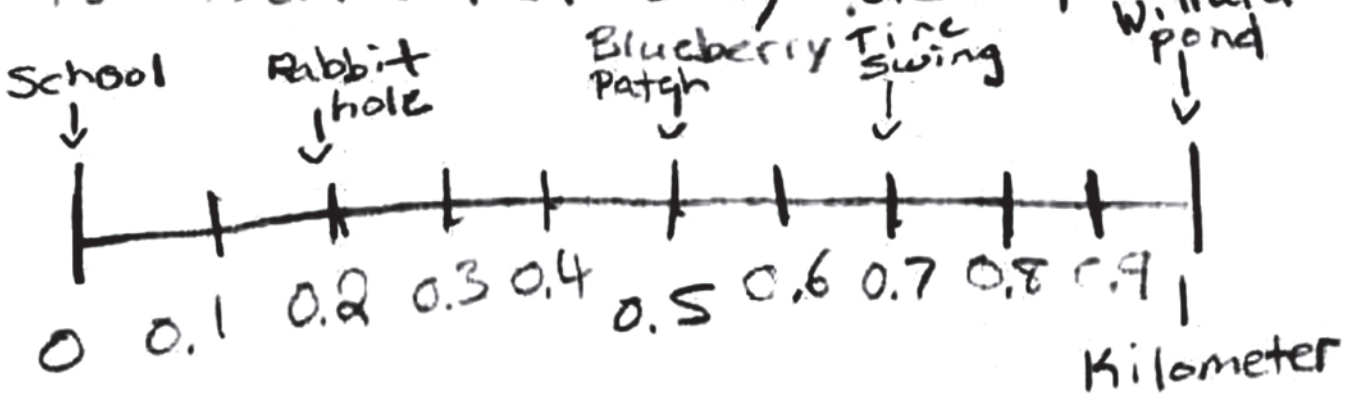
The distance is 0.7

Part a: The student's response is incorrect.

Evan walked 0.9

Part b: The student's response is correct, with no work shown or explanation given.

Natalie didn't visit any other Places because the school and Rabbit hole are next to eachother only 0.3 apart



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

Score Point 0

15

a) 7+2= 9 kilometers

Part a: The student's response is incorrect.

b) 100 kilometers

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

c) She visited the tire swing and the willard Pond.

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

Grade 5 Mathematics Released Item Information – 2013

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	FA	FA	FA	DP	DP	GM	FA	NO	GM	NO
GLE Code	4-1	4-2	4-4	4-1	4-4	4-1	4-3	4-4	4-1	4-2	4-7	4-3	4-3	4-6	4-4
Depth of Knowledge Code	1	2	3	2	2	2	2	2	2	2	1	2	2	3	3
Item Type[2]	MC	MC	MC	MC	MC	MC	MC	MC	MC	MC	SA	SA	SA	SA	CR
Answer Key	C	A	B	A	D	B	D	B	A	A					
Total Possible Points	1	1	1	1	1	1	1	1	1	1	1	1	2	2	4

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

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