ISTEP+: Grade 5

Mathematics

Companion to Released Part 1 Applied Skills (Open-Ended) Items and Scoring Notes: Online Examples

Introduction

When the *ISTEP*+ Spring 2016 test was administered to Indiana students in Grades 3-8 and 10, the Math Part 1 Applied Skills tests were only offered in a Paper/Pencil format. Beginning in Spring 2017, Math Part 1 Applied Skills assessments will be available through the online testing platform. In order to help teachers, students, and parents better understand how students can use the online testing platform to show their work in math, the Indiana Department of Education has created this document (as a companion to the Released Items and Scoring Notes document), which consists of sample student responses to the 2016 Math Part 1 Applied Skills items in an online format.

The Show All Work box gives students a place to show their thought processes. Scorers do not expect students to show computational work (such as regrouping or the long division process) in the online platform, but rather to simply list or describe the steps that they took in to solve the problem. For example, if a student uses an equation to find an answer, he can simply type in that equation. If the student were to draw a picture to solve the problem, he could describe what he drew using words in the box.

This document should be used in correlation with the Released Items and Scoring Notes document, which also contains descriptions of types of questions, a summary of scoring rules, a copy of math rubrics, and student anchor papers (sample student responses) in Paper/Pencil format.

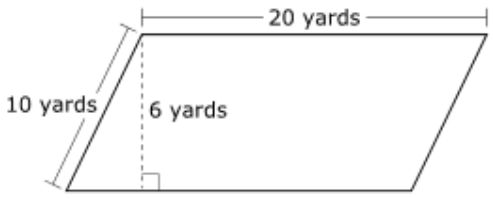
Item #1

Constructed-Response Online

Planting a Garden

Question 1, Sample A – Measurement Score Point 2; Process Score Point 2

Megan has a garden in the shape of a parallelogram, as shown.



Part A

What is the area, in square yards, of the garden?

Show All Work

$20 \times 6 = 120$

Math symbols

Answer 120 square yards

Part B

Megan will plant 5 pumpkin seeds for every 1 square yard in her garden. Pumpkin seeds cost $2 for a package of 50 seeds. How much will it cost Megan to buy enough pumpkin seeds to plant in her garden?

Show All Work

$2 \times 12 = 24$
$3 \times 120 = 600$

50 100 150 200 250 300 350 400 450 500 550 600 12 packs

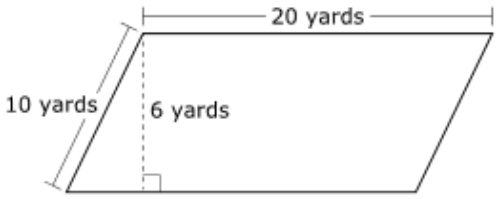
Math symbols

Answer $ 24

Scoring Notes: The response demonstrates a thorough understanding of finding the area of parallelograms by providing a valid setup and calculating the correct area in Part A. The response demonstrates a thorough understanding of reasoning quantitatively by providing a valid setup and calculating the correct cost in Part B. This response receives two points for content and two points for process.

Question 1, Sample B – Measurement Score Point 2; Process Score Point 1

Megan has a garden in the shape of a parallelogram, as shown.



Part A

What is the area, in square yards, of the garden?

Show All Work

$20 \times 6 = 120$ sq. yds.

Math symbols

Answer 120 square yards

Part B

Megan will plant 5 pumpkin seeds for every 1 square yard in her garden. Pumpkin seeds cost $2 for a package of 50 seeds. How much will it cost Megan to buy enough pumpkin seeds to plant in her garden?

Show All Work

$5 \times 120 = 600$
$600 \div 50 = 12$

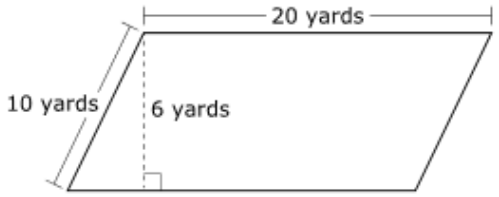
Math symbols

Answer $ 12

Scoring Notes: The response demonstrates a thorough understanding of finding the area of parallelograms by providing a valid setup and calculating the correct area in Part A. The response demonstrates a partial understanding of reasoning quantitatively by calculating a correct cost based on an invalid setup for Part B (failed to multiply 12 by 2). This response receives two points for content and one point for process.

Question 1, Sample C – Measurement Score Point 1; Process Score Point 0

Megan has a garden in the shape of a parallelogram, as shown.



Part A

What is the area, in square yards, of the garden?

Show All Work

$20 \times 6 = 120$ sq. yds.

Math symbols

Answer 12 square yards

Part B

Megan will plant 5 pumpkin seeds for every 1 square yard in her garden. Pumpkin seeds cost $2 for a package of 50 seeds. How much will it cost Megan to buy enough pumpkin seeds to plant in her garden?

Show All Work

$120 \div 2 = 60$
$60 + 50 = 110$

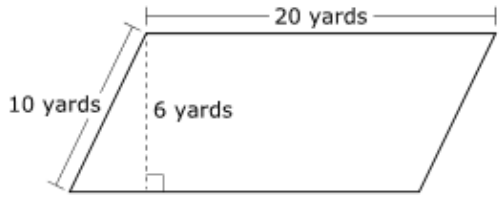
Math symbols

Answer $ 110

Scoring Notes: The response demonstrates a partial understanding of finding the area of parallelograms by providing a correct setup in Part A. However, there is a transcription error because 12 is shown in the answer blank instead of 120. The response demonstrates a limited understanding of reasoning quantitatively by providing an invalid setup and calculating the cost incorrectly in Part B. This response receives one point for content and zero points for process.

Question 1, Sample D – Measurement Score Point 1; Process Score Point 0

Megan has a garden in the shape of a parallelogram, as shown.



Part A

What is the area, in square yards, of the garden?

Show All Work

Math symbols

Answer 120 square yards

Part B

Megan will plant 5 pumpkin seeds for every 1 square yard in her garden. Pumpkin seeds cost $2 for a package of 50 seeds. How much will it cost Megan to buy enough pumpkin seeds to plant in her garden?

Show All Work

Math symbols

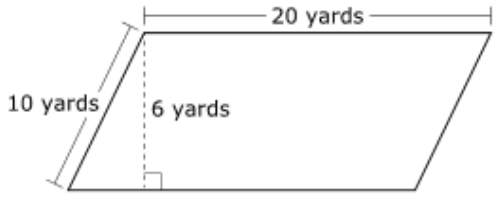
$3 \times 50 = 150$
$2 \times 50 = 100$
$3 \times 2 = 6$

Answer $ 6

Scoring Notes: The response demonstrates a partial understanding of finding the area of parallelograms by calculating the correct area. However, setup or work is shown for Part a. The response demonstrates a limited understanding of reasoning quantitatively by providing an invalid setup and calculating the cost incorrectly in Part B. This response receives one point for content and zero points for process.

Question 1, Sample E – Measurement Score Point 0; Process Score Point 2

Megan has a garden in the shape of a parallelogram, as shown.



Part A

What is the area, in square yards, of the garden?

Show All Work

$20 \times 10 = 200 \times 6 = 1200$

Math symbols

Answer 1200 square yards

Part B

Megan will plant 5 pumpkin seeds for every 1 square yard in her garden. Pumpkin seeds cost $2 for a package of 50 seeds. How much will it cost Megan to buy enough pumpkin seeds to plant in her garden?

Show All Work

$120 \times 2 = 240$
$2 \times 1200 = 6000$
$6000 \div 50 = 120$

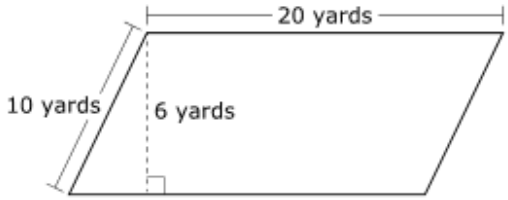
Math symbols

Answer $ 240

Scoring Notes: The response demonstrates a limited understanding of finding the area of parallelograms by providing an invalid setup and calculating the area incorrectly in Part A. The response demonstrates a thorough understanding of reasoning quantitatively by providing a valid setup and calculating the correct cost in Part B based on the incorrect response from Part A. This response receives zero points for content and two points for process.

Question 1, Sample F – Measurement Score Point 0; Process Score Point 0

Megan has a garden in the shape of a parallelogram, as shown.



Part A

What is the area, in square yards, of the garden?

Show All Work

$20 \times 6 - 120 + 16 = \square$

Math symbols

Answer 136 square yards

Part B

Megan will plant 5 pumpkin seeds for every 1 square yard in her garden. Pumpkin seeds cost $2 for a package of 50 seeds. How much will it cost Megan to buy enough pumpkin seeds to plant in her garden?

Show All Work

$5 \times 136 = 680$
$680 \div 50 = \$13$

Math symbols

Answer $ 13

Scoring Notes: The response demonstrates a limited understanding of finding the area of parallelograms by providing an invalid setup and calculating the area incorrectly in Part A. The response demonstrates a limited understanding of reasoning quantitatively by providing an invalid setup and calculating the cost incorrectly in Part B based on the incorrect response from Part A. This response receives zero points for content and zero points for process.

Item #2

Constructed-Response Online

Plotting Miles on the School Bus

Note: This item is not available for online samples.

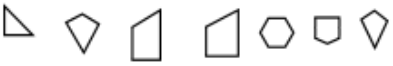
Item #3

Constructed-Response Online

Sorting Shapes

Question 3, Sample A – Geometry Score Point 2; Process Score Point 2

Jamie sorts 6 shapes into three groups based on their angle measures. She places some shapes in more than one group, as shown.

Group One	Group Two	Group Three
		

Part A

Complete each sentence.

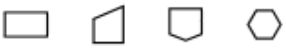
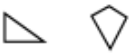
All of the shapes in Group One have at least one [right] angle.

All of the shapes in Group Two have at least one [acute] angle.

All of the shapes in Group Three have at least one [obtuse] angle.

Part B

Ivan sorts the same 6 shapes into two groups, as shown, based on a characteristic of the sides of the shapes.

Group One	Group Two
	

Explain the rule Ivan used to sort the shapes into Group One.

The rule Ivan used to sort the shapes in group one is each shape has at least 1 pair of parallel sides.

Math symbols

Scoring Notes: The response demonstrates a thorough understanding of identifying and classifying triangles by correctly completing each sentence in Part A. The response demonstrates a thorough understanding of looking for structure and constructing viable arguments by providing a valid explanation for the rule Ivan used to sort the shapes into Group One. This response receives two points for content and two points for process.

Item #4

Extended-Response Online

Building a Play House

Question 4, Sample A – Measurement Score Point 3; Process Score Point 3

Janet is building a play house using cardboard boxes. She has three boxes as described in the table.

Box	Length (feet)	Width (feet)	Height (feet)
A	5	4	6
B	3	4	6
C	4	4	4

Part A

What is the total volume, in cubic feet, of the play house if Janet uses Box A and Box B?

Answer 192 cubic feet

Part B

Janet thinks that if she uses all three boxes, the total volume of the play house will be 278 cubic feet.

Is Janet correct? Use words, numbers, and/or symbols to support your answer.

Show All Work

$(4 \times 4) \times 4$
(16×4)
64

$192 + 64 = 256, 278 - 256 = 22$

Janet s not correct ☐! I know this because box $A +$ ☐ box $B +$ ☐ box $C =$ ☐ 256 and Janet's guess was 278, 22 more than 256.

Math symbols

Part C

Janet's dad gives her more boxes. The table shows the number of each box Janet has now.

Box	Number
A	2
B	2
C	4

Janet uses a total of 4 boxes. The total volume of the 4 boxes is 328 cubic feet.

What are the 4 boxes Janet uses?

Show All Work

Box A 1
Box B 2
Box C 1
$256 + 72 = 328$
The four boxes Janet would need are 1 Box A, 2 Box Bs, and 1 box C.

Math symbols

Scoring Notes: The response demonstrates a thorough understanding of finding volume in real-world problems by finding the correct volume in Part A, the correct volumes for each box in Parts A and B, and the total volume of all three boxes in Part B. The response demonstrates a thorough understanding of reasoning quantitatively and constructing viable arguments by providing a valid explanation of why Janet is incorrect in Part B and by providing the correct number of boxes in Part C with a valid setup. This response receives three points for content and three points for process.