

ANSWER KEY: ITEM SET 1

Item Set 1 - Question 1 (TEI Drag and Drop)

Find the missing length, width, or perimeter for each rectangle in the table.

Drag and drop a number into each blank.

- 7 12 13

	Length (inches)	Width (inches)	Perimeter (inches)
Rectangle A	4	3	14
Rectangle B	2	8	20
Rectangle C	3	5	16

Item Information		
Answer:	See Image	
Colorado Academic Standards (CAS) Evidence Outcomes:	3.MD.D.8	Solve real world and mathematical problems involving perimeters of polygons, including finding the perimeter given the side lengths, finding an unknown side length, and exhibiting rectangles with the same perimeter and different areas or with the same area and different perimeters.
Evidence Statement:	3.MD.8	Solve real world and mathematical problems involving perimeters of polygons, including finding the perimeter given the side lengths, finding an unknown side length, and exhibiting rectangles with the same perimeter and different areas or with the same area and different perimeters.
Subclaim:	B - Supporting Content	The student solves problems involving the Additional and Supporting Content for her grade/course with connections to the Standards for Mathematical Practice.
P Value:	0.169	

Item Set 1 - Question 2 (TEI Drag and Drop, Constructed Response)

A teacher is making a rectangular reading space for students in a classroom.

Part A

There are three different ways the teacher can make the reading space. The table is missing some of the information needed.

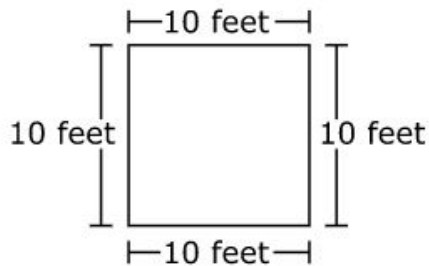
Drag and drop a number into each spot on the table. Each number may be used once, more than once, or not at all.

4 7 8 13 27 42

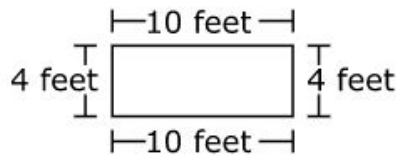
	Length (feet)	Width (feet)	Area (square feet)
Reading Space 1	4	9	36
Reading Space 2	7	6	42
Reading Space 3	8	8	64

Part B

The students make two different drawings of a reading space. The students think each reading space has an area of 40 square feet.



Drawing 1



Drawing 2

- Explain whether each drawing shows an area of 40 square feet.
- Explain a different way the reading space can have an area of 40 square feet.

Enter your explanations in the space provided.

Item Information		
Answer:	See Scoring Rubric and Sample Student Responses	
Colorado Academic Standards (CAS) Evidence Outcomes:	3.MD.C.7.b	Multiply side lengths to find areas of rectangles with whole number side lengths in the context of solving real world and mathematical problems, and represent whole-number products as rectangular areas in mathematical reasoning.
Evidence Statement:	3.C.3-2	Base explanations/reasoning on concrete referents such as diagrams (whether provided in the prompt or constructed by the student in her response). Content Scope: Knowledge and skills articulated in 3.MD.5, 3.MD.6, 3.MD.7. i) Pool should contain tasks with and without contexts. ii) Tasks with a context may present realistic or quasi-realistic images of a contextual situation (e.g., a drawing of a meadow). However, tasks do not provide the sort of abstract drawings that help the student to represent the situation mathematically (e.g., a tiling of the meadow).
Subclaim:	C - Expressing Mathematical Reasoning	The student expresses grade/course-level appropriate mathematical reasoning by constructing viable arguments, critiquing the reasoning of others, and/or attending to precision when making mathematical statements.
Score Point Distribution:	5.2% of students earned 3 points. 13.8% of students earned 2 points. 29.7% of students earned 1 point. 51.2% of students earned 0 points.	

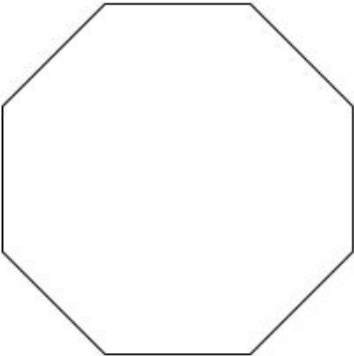
Scoring Rubric – Part A (Machine Scored)	
Points	Attributes
1	<p>Computation Component: Student provides the correct values:</p> <p>Reading Space 1: 4 for the length</p> <p>Reading Space 2: 42 for the area</p> <p>Reading Space 3: 8 for the width</p> <p>Note: The three values must be correct to receive credit.</p>
0	Student response is incorrect or irrelevant.

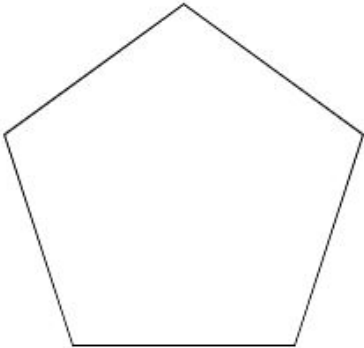
Scoring Rubric – Part B	
Points	Attributes
2	<p>Student response includes each of the following 2 elements.</p> <ul style="list-style-type: none"> • Reasoning Component: Valid explanation whether each drawing shows an area of 40 square feet. • Reasoning Component: Valid explanation of a different way the reading space can have an area of 40 square feet.
1	Student response includes 1 of the 2 elements.
0	Student response is incorrect or irrelevant.

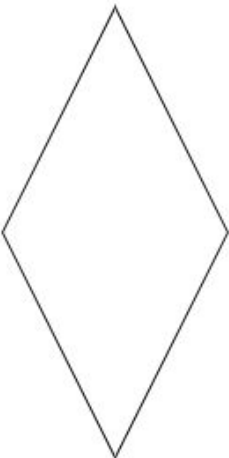
Sample Student Response:	Drawing 1 is incorrect when you find the area you multiply the two numbers so the area of drawing one is 100. Number 2 is correct $4 \times 10 = 40$ so it does have the area of 40. Another way it could have an area of 40 is $5 \times 8 = 40$ or $2 \times 20 = 40$ or maybe 1×40 .
Annotation for Sample Student Response:	<p>Score Point 2 The response receives full credit. It includes each of the two required elements.</p> <p>Reasoning Component:</p> <ul style="list-style-type: none"> • Student Response: Drawing 1 is incorrect, area of drawing one is 100. Number 2 is correct $4 \times 10 = 40$. <ul style="list-style-type: none"> ○ Rationale for Score: The student provides a valid explanation of whether each drawing shows an area of 40 square feet by providing that drawing 1 is incorrect because the area is 100 (Drawing 1 is incorrect, area is 100) and that drawing 2 is correct because the area is 40 (Number 2 is correct $4 \times 10 = 40$). <p>Reasoning Component:</p> <ul style="list-style-type: none"> • Student Response: Another way it could have an area of 40 is $5 \times 8 = 40$ or $2 \times 20 = 40$, or 1×40. <ul style="list-style-type: none"> ○ Rationale for score: The student provides a valid explanation of another way the reading space can have an area of 40 square feet (area of 40 is $5 \times 8 = 40$ or $2 \times 20 = 40$ or 1×40). Note that any one of the three expressions that equal 40 square feet would earn credit for this component. <p>Note: Sample student responses are not representative of all correct answers for an item and are only provided as a guide to assist teachers with scoring.</p>

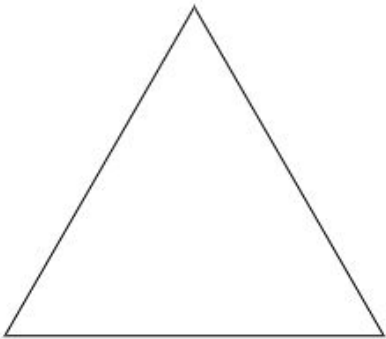
Item Set 1 - Question 3 (Selected Response)

Which shape is a quadrilateral?

A. 

B. 

C. 

D. 

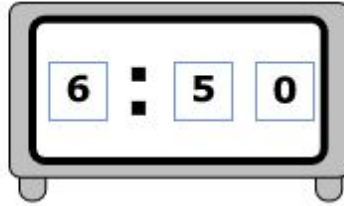
Item Information		
Answer:	C	
Colorado Academic Standards (CAS) Evidence Outcomes:	3.G.A.1	Explain that shapes in different categories (e.g., rhombuses, rectangles, and others) may share attributes (e.g., having four sides), and that the shared attributes can define a larger category (e.g., quadrilaterals). Recognize rhombuses, rectangles, and squares as examples of quadrilaterals, and draw examples of quadrilaterals that do not belong to any of these subcategories.
Evidence Statement:	3.G.1	Understand that shapes in different categories (e.g., rhombuses, rectangles, and others) may share attributes (e.g., having four sides), and that the shared attributes can define a larger category (e.g., quadrilaterals). Recognize rhombuses, rectangles, and squares as examples of quadrilaterals, and draw examples of quadrilaterals that do not belong to any of these subcategories. i) A trapezoid is defined as "A quadrilateral with at least one pair of parallel sides."
Subclaim:	B - Supporting Content	The student solves problems involving the Additional and Supporting Content for her grade/course with connections to the Standards for Mathematical Practice.
P Value:	0.673	

Item Set 1 - Question 4 (TEI Drag and Drop)

A student practices the piano for 35 minutes. He starts practice at 6:15.

What time will he end practice?

Drag and drop the numbers into the boxes to show the correct end time on the clock.

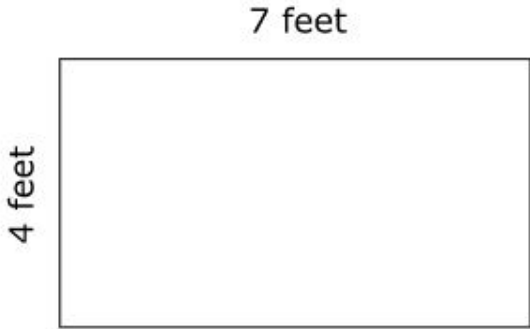


0 1 2 3 4 5 6 7 8 9

Item Information		
Answer:	See Image	
Colorado Academic Standards (CAS) Evidence Outcomes:	3.MD.A.1	Tell and write time to the nearest minute and measure time intervals in minutes. Solve word problems involving addition and subtraction of time intervals in minutes, e.g., by representing the problem on a number line diagram.
Evidence Statement:	3.MD.1-1	Tell and write time to the nearest minute and measure time intervals in minutes. i) Time intervals are limited to 60 minutes. ii) No more than 20% of items require determining a time interval from clock readings having different hour values. Acceptable intervals: ex. Start time 1:20, end time 2:10 – time interval is 50 minutes. Unacceptable intervals: ex. Start time 1:20, end time 2:30 – time interval exceeds 60 minutes.
Subclaim:	A - Major Content	The student solves problems involving the Major Content for her grade/course with connections to the Standards for Mathematical Practice.
P Value:	0.47	

Item Set 1 - Question 5 (Fill in the Blank)

The diagram shows a rectangular tabletop.



7 feet

4 feet

What is the area, in square feet, of the tabletop?

Enter your answer in the box.

Item Information		
Answer:	See Image	
Colorado Academic Standards (CAS) Evidence Outcomes:	3.MD.C.7.b	Multiply side lengths to find areas of rectangles with whole number side lengths in the context of solving real world and mathematical problems, and represent whole-number products as rectangular areas in mathematical reasoning.
Evidence Statement:	3.MD.7b-1	Relate area to the operations of multiplication and addition. b. Multiply side lengths to find areas of rectangles with whole-number side lengths in the context of solving real-world and mathematical problems. i) Products are limited to the 10 x 10 multiplication table. Notes: This ES is different from 3.OA.3-1 in the following ways: 3.MD.7b-1 emphasizes application/skill while the emphasis of 3.OA.3-1 is on demonstration of understanding of multiplication using not only area but also equal groups and arrays by modeling. 3.MD.7b-1 permits mathematical problems while 3.OA.3-1 is restricted to word problems. 3.MD.7b-1 allows for factors less than or equal to 5 while the factors used in 3.OA.3-1 are restricted to the harder three quadrants.
Subclaim:	A - Major Content	The student solves problems involving the Major Content for her grade/course with connections to the Standards for Mathematical Practice.
P Value:	0.567	

Item Set 1 - Question 6 (Selected Response)

What could the expression $27 \div 3$ stand for?

A. There are 3 cows that leave a group of 27 cows.

B. There are 3 cows that join a group of 27 cows.

C. There are 27 groups with 3 cows each.

D. There are 27 cows in 3 equal groups.

Item Information		
Answer:	D	
Colorado Academic Standards (CAS) Evidence Outcomes:	3.OA.A.2	Interpret whole-number quotients of whole numbers, e.g., interpret $56 \div 8$ as the number of objects in each share when 56 objects are partitioned equally into 8 shares, or as a number of shares when 56 objects are partitioned into equal shares of 8 objects each. For example, describe a context in which a number of shares or a number of groups can be expressed as $56 \div 8$.
Evidence Statement:	3.OA.2	Interpret whole-number quotients of whole numbers, e.g., interpret $56 \div 8$ as the number of objects in each share when 56 objects are partitioned equally into 8 shares, or as a number of shares when 56 objects are partitioned into equal shares of 8 objects each. For example, describe a context in which a number of shares or a number of groups can be expressed as $56 \div 8$. i) Tasks involve interpreting rather than calculating quotients in terms of equal groups, arrays, area, and/or measurement quantities. (See 2020 CAS, Appendix: Table 2.) For example, “35 books are placed equally on 7 shelves” can be represented by the expression $35 \div 7$ rather than “Marcie has 35 books. She placed the same number on each of 7 shelves. How many books did she place on each shelf?” ii) Tasks do not require students to interpret quotients in terms of repeated subtraction, skip-counting, or jumps on the number line. iii) The italicized example refers to describing a context. But describing a context is not the only way to meet the standard. For example, another way to meet the standard would be to identify contexts in which a number of objects can be expressed as a specified quotient. iv) 50% of tasks require interpreting quotients as a number of objects in each share. 50% of tasks require interpreting quotients as a number of equal shares.
Subclaim:	A - Major Content	The student solves problems involving the Major Content for her grade/course with connections to the Standards for Mathematical Practice.
P Value:	0.478	

Item Set 1 - Question 7 (Fill in the Blank)

A worker puts together baskets of fruit. He has a total of 63 pieces of fruit. He places 7 pieces of fruit in each basket.

Part A

There are 3 oranges in each basket. How many oranges are there in total?

Enter your answer in the box.

Part B

The worker sells 2 baskets of fruit. How many pieces of fruit does the worker have left in the remaining baskets?

Enter your answer in the box.

Item Information		
Answer:	See Image	
Colorado Academic Standards (CAS) Evidence Outcomes:	3.OA.D.8	Solve two-step word problems using the four operations. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding. (This evidence outcome is limited to problems posed with whole numbers and having whole-number answers; students should know how to perform operations in the conventional order of operations when there are no parentheses to specify a particular order.)
Evidence Statement:	3.OA.8	Solve two-step word problems using the four operations. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding. i) Tasks do not require a student to write a single equation with a letter standing for the unknown quantity in a two-step problem, and then solve that equation. ii) Tasks may require students to write an equation as part of their work to find a solution, but students are not required to use a letter for the unknown. iii) Addition, subtraction, multiplication and division situations in these problems may involve any of the basic situation types with unknowns in various positions (See 2020 CAS, Appendix: Table 1 and Appendix: Table 2.) iv) If scaffolded, one of the 2 parts must require 2-steps. The other part may consist of 1-step. v) Conversions should be part of the 2-steps and should not be a step on its own. vi) If the item is 2 points, the item should be a 2 point, unscaffolded item but the rubric should allow for 2-1-0 points.
Subclaim:	A - Major Content	The student solves problems involving the Major Content for her grade/course with connections to the Standards for Mathematical Practice.
P Value:	0.237	

Item Set 1 - Question 8 (Selected Response)

What is the value of $537 - 368$?

A. 169

B. 179

C. 249

D. 269

Item Information		
Answer:	A	
Colorado Academic Standards (CAS) Evidence Outcomes:	3.NBT.A.2	Fluently add and subtract within 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction.
Evidence Statement:	3.NBT.2	Fluently add and subtract within 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction. i) Tasks have no context. ii) Tasks are not explicitly timed.
Subclaim:	B - Supporting Content	The student solves problems involving the Additional and Supporting Content for her grade/course with connections to the Standards for Mathematical Practice.
P Value:	0.481	

Item Set 1 - Question 9 (Selected Response)

Point W is shown at $\frac{5}{2}$ on the number line.



Which number line shows a fraction equivalent to $\frac{5}{2}$?

- A.
- B.
- C.
- D.

Item Information		
Answer:	C	
Colorado Academic Standards (CAS) Evidence Outcomes:	3.NF.A.3.a	Understand two fractions as equivalent (equal) if they are the same size, or the same point on a number line.
Evidence Statement:	3.NF.3a-2	Explain equivalence of fractions in special cases and compare fractions by reasoning about their size. a. Understand two fractions as equivalent (equal) if they are the same point on a number line. i) Tasks are limited to fractions with denominators 2, 3, 4, 6, and 8. ii) Fractions equivalent to whole numbers are limited to 0 through 5. iii) The explanation aspect of 3.NF.3 is not assessed here.
Subclaim:	A - Major Content	The student solves problems involving the Major Content for her grade/course with connections to the Standards for Mathematical Practice.
P Value:	0.392	