Math
Released Item 2019

Grade 4
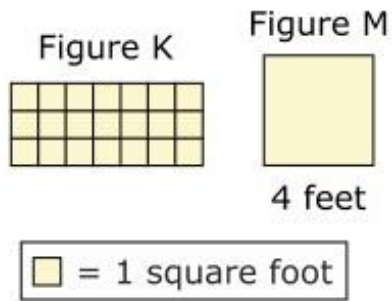
Area of Square Tiles
0233-M01161

Anchor Set
A1 – A10

With Annotations

Prompt

Figure K is covered with square tiles each measuring 1 square foot. There are no gaps or overlaps in the tiles. Figure M is a square with side lengths of 4 feet.

Figure K

Figure M

4 feet

☐ = 1 square foot

Part A

Joan said the area of Figure K is found by adding $3 + 7 + 3 + 7$, so the area is 20 square feet. Joan made a mistake in her reasoning.

Explain the mistake Joan made. Find the correct area for Figure K.

Enter your explanation and your answer in the space provided.

▾ Math symbols

+	−	×	÷
$\frac{\Box}{\Box}$	$\Box\frac{\Box}{\Box}$	(·)	[·]
=	<	>	≠
$	°	?	

Part B

Figures K and M are pushed together to form a larger figure. There are no gaps or overlaps of the two figures. To find the area of the larger figure, Andy multiplied the area of Figure K by the area of Figure M. Andy is incorrect in his reasoning.

- Explain the steps Andy should take to find the area of the larger figure.
- What is the area, in square feet, of the larger figure?
- Show your work or explain your answers.

Enter your explanation, your answer, and your work or explanation in the space provided.

▾ Math symbols

+	−	×	÷
▯/▯	▯ ▯/▯	(·)	[·]
=	<	>	≠
$	°	?	

M04_0233-M01161 Rubric-Part A	
Score	**Description**

2	Student response includes each of the following 2 elements.
	
	• **Reasoning component** = 1 point
	
	    o Valid explanation of Joan's mistake
	
	• **Computation component** = 1 point
	
	    o Correct area, 21 square feet
	
	Sample Student Response:
	
	    Joan found the perimeter of the rectangle instead of the area. The correct area is 21 square feet.
	
	Or other valid response.

1	Student response includes 1 of the 2 elements.
0	The response is incorrect or irrelevant.

M04_0233-M01161 Rubric-Part B	
Score	**Description**

2	Student response includes each of the following 2 elements:
	
	• **Reasoning component** = 1 point
	
	    o Valid explanation for finding the area
	
	• **Computation component** = 1 point
	
	    o Correct area for combined figure, 37 square feet
	
	Sample Student Response:
	
	    To find the area Andy should add the area of Figure K to the area of Figure M because when you combine the areas of two figures into a larger figure, you are adding the areas to each other, not multiplying them. So, Andy should add 16 square feet to the area of Figure K, which is 21 square feet, which would total 37 square feet.
	
	Or other valid response.

1	Student response includes 1 of the 2 elements.
0	The response is incorrect or irrelevant.

A1

Figure K is covered with square tiles each measuring 1 square foot. There are no gaps or overlaps in the tiles. Figure M is a square with side lengths of 4 feet.

Figure K   **Figure M**

4 feet

□ = 1 square foot

Part A

Joan said the area of Figure K is found by adding $3 + 7 + 3 + 7$, so the area is 20 square feet. Joan made a mistake in her reasoning.

Explain the mistake Joan made. Find the correct area for Figure K.

> Joan's mistake is that she added the wrong numbers. You could add seven three times or three seven times. Also, you could multiply $7 \times 3 = 21$.

Part B

Figures K and M are pushed together to form a larger figure. There are no gaps or overlaps of the two figures. To find the area of the larger figure, Andy multiplied the area of Figure K by the area of Figure M. Andy is incorrect in his reasoning.

- Explain the steps Andy should take to find the area of the larger figure.
- What is the area, in square feet, of the larger figure?
- Show your work or explain your answers.

> Andy should first find the square feet of each shape, then add them together. $21 + 16 = 37$ The area of the two shapes is 37 square feet.

Annotation

Anchor Paper 1
Part A: Score Point 2
This response receives full credit. The response includes each of the two required elements:

- A correct explanation of Joan's mistake is provided (added the wrong numbers . . . add seven three times or three seven times). While the explanation of the mistake is not discussing perimeter, it does correctly explain how repeated addition of the squares in each row or in each column can be used to determine the area. This is a valid strategy to use to determine area for this figure, and provides a valid explanation of what mistake was made. In addition, the student notes that Joan added the wrong numbers, which further clarifies why repeated addition of either 7 or 3 is appropriate.

- The correct area of Figure K is provided (21). Note that the area does not have to be labeled as square feet.

Part B: Score Point 2
This response receives full credit. The response includes each of the two required elements:

- A correct explanation for finding the area of the larger figure is provided (first find the square feet of each shape, then add them together).

- The correct area for the combined figure is provided (37 square feet).

Figure K is covered with square tiles each measuring 1 square foot. There are no gaps or overlaps in the tiles. Figure M is a square with side lengths of 4 feet.

Figure K   **Figure M**

4 feet

☐ = 1 square foot
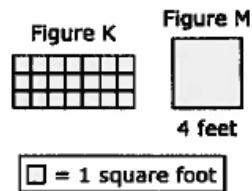
Part A

Joan said the area of Figure K is found by adding $3 + 7 + 3 + 7$, so the area is 20 square feet. Joan made a mistake in her reasoning.

Explain the mistake Joan made. Find the correct area for Figure K.

> Joan made a mistake because she only counted the perimeter, and forgot to count the inside so the answer is 21

Part B

Figures K and M are pushed together to form a larger figure. There are no gaps or overlaps of the two figures. To find the area of the larger figure, Andy multiplied the area of Figure K by the area of Figure M. Andy is incorrect in his reasoning.

- Explain the steps Andy should take to find the area of the larger figure.
- What is the area, in square feet, of the larger figure?
- Show your work or explain your answers.

> the answer is 37 because you have to multiply 4x4 which eqauls 16 then add 21 with 16 which eqauls 37 and thats your answer

Anchor Paper 2
Part A: Score Point 2
This response receives full credit. The response includes each of the two required elements:

- A correct explanation of Joan's mistake is provided (only counted the perimeter, and forgot to count the inside). Note that when counting squares to find perimeter, the corners are counted twice since each side is added, making the explanation true. Also, when counting squares to find area, all squares are counted once, again making the explanation true. Finally, simply recognizing that Joan found the perimeter and not the area is sufficient on its own.

- The correct area of Figure K is provided (21). The label of square feet is not required.

Part B: Score Point 2
This response receives full credit. The response includes each of the two required elements:

- A correct explanation for finding the area of the larger figure is provided (you have to multiply 4×4 which equals 16 then add 21 with 16). The calculations for the area of Figure M are provided to identify Figure M. This area is then added to the area of Figure K, as identified in Part A.

- The correct area for the combined figure is provided (37). The label of square feet is not required.

Figure K is covered with square tiles each measuring 1 square foot. There are no gaps or overlaps in the tiles. Figure M is a square with side lengths of 4 feet.

Figure K   Figure M

4 feet

□ = 1 square foot
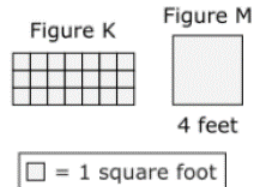
Part A

Joan said the area of Figure K is found by adding $3 + 7 + 3 + 7,$ so the area is 20 square feet. Joan made a mistake in her reasoning.

Explain the mistake Joan made. Find the correct area for Figure K.

Enter your explanation and your answer in the space provided.

> your mistake was that insn't how you find the area. That is how you find perimeter. you multiply length times width to find the area.

Part B

Figures K and M are pushed together to form a larger figure. There are no gaps or overlaps of the two figures. To find the area of the larger figure, Andy multiplied the area of Figure K by the area of Figure M. Andy is incorrect in his reasoning.

- Explain the steps Andy should take to find the area of the larger figure.
- What is the area, in square feet, of the larger figure?
- Show your work or explain your answers.

Enter your explanation, your answer, and your work or explanation in the space provided.

> first you find out the area of the square or figure M. Then find out the area of the rectangle or figure K. Then add those areas together.
>
> $$4 \times 4 = 16$$
> $$7 \times 3 = 21$$
>
> $$16 + 21 = 37\, ft\, square$$

Annotation

Anchor Paper 3
Part A: Score Point 1
This response receives partial credit. The response includes one of the two required elements:

- A correct explanation of Joan's mistake is provided (that isn't how you find the area. That is how you find perimeter).

The area of Figure K is not provided.

Part B: Score Point 2
This response receives full credit. The response includes each of the two required elements:

- A correct explanation for finding the area of the larger figure is provided (first you find out the area of the square or figure M. Then find out the area of the rectangle or figure K. Then add those areas together). The response the shows the work for this explanation (4 x 4 = 16 7 x 3 = 21   16 + 21 =37). Either method is sufficient for credit for this element.

- The correct area for the combined figure is provided (37 *ft square*).

Figure K is covered with square tiles each measuring 1 square foot. There are no gaps or overlaps in the tiles. Figure M is a square with side lengths of 4 feet.

Figure K   **Figure M**

4 feet

□ = 1 square foot
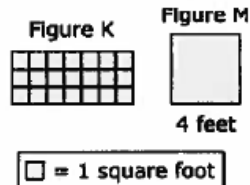
Part A

Joan said the area of Figure K is found by adding $3 + 7 + 3 + 7$, so the area is 20 square feet. Joan made a mistake in her reasoning.

Explain the mistake Joan made. Find the correct area for Figure K.

Joan did the perimiter the area is 21

Part B

Figures K and M are pushed together to form a larger figure. There are no gaps or overlaps of the two figures. To find the area of the larger figure, Andy multiplied the area of Figure K by the area of Figure M. Andy is incorrect in his reasoning.

- Explain the steps Andy should take to find the area of the larger figure.
- What is the area, in square feet, of the larger figure?
- Show your work or explain your answers.

it is 37

Annotation

Anchor Paper 4
Part A: Score Point 2
This response receives full credit. The response includes each of the two required elements:

- A correct explanation of Joan's mistake is provided (Joan did the perimiter).

- The correct area of Figure K is provided (21). The label of square feet is not required.
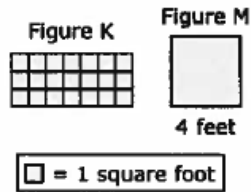
Part B: Score Point 1
This response receives partial credit. The response includes one of the two required elements:

- The correct area for the combined figure is provided (37). The label of square feet is not required.

No explanation of how to find the area of the larger figure is provided.

Figure K is covered with square tiles each measuring 1 square foot. There are no gaps or overlaps in the tiles. Figure M is a square with side lengths of 4 feet.

Figure K   **Figure M**

4 feet

☐ = 1 square foot

Part A

Joan said the area of Figure K is found by adding $3 + 7 + 3 + 7$, so the area is 20 square feet. Joan made a mistake in her reasoning.

Explain the mistake Joan made. Find the correct area for Figure K.

SHE said the perimeter not the area

Part B

Figures K and M are pushed together to form a larger figure. There are no gaps or overlaps of the two figures. To find the area of the larger figure, Andy multiplied the area of Figure K by the area of Figure M. Andy is incorrect in his reasoning.

- Explain the steps Andy should take to find the area of the larger figure.
- What is the area, in square feet, of the larger figure?
- Show your work or explain your answers.

37

Annotation

Anchor Paper 5
Part A: Score Point 1
This response receives partial credit. The response includes one of the two required elements:

- A correct explanation of Joan's mistake is provided (SHE said the perimeter not the area).

No attempt to show the correct area of Figure K is provided.

Part B: Score Point 1
This response receives partial credit. The response includes one of the two required elements:

- The correct area for the combined figure is provided (37).

No attempt to explain how to find the area of the larger figure is provided.

Figure K is covered with square tiles each measuring 1 square foot. There are no gaps or overlaps in the tiles. Figure M is a square with side lengths of 4 feet.

Figure K   **Figure M**

4 feet

☐ = 1 square foot
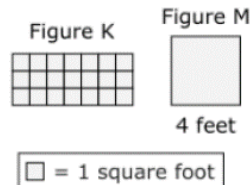
Part A

Joan said the area of Figure K is found by adding $3 + 7 + 3 + 7,$ so the area is 20 square feet. Joan made a mistake in her reasoning.

Explain the mistake Joan made. Find the correct area for Figure K.

Enter your explanation and your answer in the space provided.

> $3 + 7 + 3 + 7$ is perimiter to find area you have to multiply length by hieght in our case it will be $3 \times 7 = 21$ so the area for figure k is 21 square feet

Part B

Figures K and M are pushed together to form a larger figure. There are no gaps or overlaps of the two figures. To find the area of the larger figure, Andy multiplied the area of Figure K by the area of Figure M. Andy is incorrect in his reasoning.

- Explain the steps Andy should take to find the area of the larger figure.
- What is the area, in square feet, of the larger figure?
- Show your work or explain your answers.

Enter your explanation, your answer, and your work or explanation in the space provided.

> andy needs to do 4×4 wich is 16 because the length is 4 ft and the hieght is 4 ft

Anchor Paper 6
Part A: Score Point 2
This response receives full credit. The response includes each of the two required elements:

- A correct explanation of Joan's mistake is provided (3 + 7 + 3 + 7 is perimiter to find the area you have to multiply length by height). Note that either identifying that Joan finds the perimeter or that she should have multiplied length by height would be sufficient on its own.

- The correct area of Figure K is provided (21 square feet).
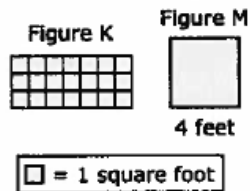
Part B: Score Point 0
This response receives no credit. The response includes none of the two required elements:

No explanation for finding the area of the larger figure is provided. Note that the area and work to find the area of Figure M is provided (4 x 4 = 16), not the area of the combined figure.

The area for the combined figure is not provided.

Figure K is covered with square tiles each measuring 1 square foot. There are no gaps or overlaps in the tiles. Figure M is a square with side lengths of 4 feet.

Figure K

Figure M

4 feet

☐ = 1 square foot

Part A

Joan said the area of Figure K is found by adding $3 + 7 + 3 + 7$, so the area is 20 square feet. Joan made a mistake in her reasoning.

Explain the mistake Joan made. Find the correct area for Figure K.

> the correct area is 21 feet total.

Part B

Figures K and M are pushed together to form a larger figure. There are no gaps or overlaps of the two figures. To find the area of the larger figure, Andy multiplied the area of Figure K by the area of Figure M. Andy is incorrect in his reasoning.

- Explain the steps Andy should take to find the area of the larger figure.
- What is the area, in square feet, of the larger figure?
- Show your work or explain your answers.

> the steps andy should take first, is it a square or not. if it is all the faces are the same as the first one. so then multiply the number by four then thats you answer. It is 16sq feet in all because it is a square so
> $4 \times 4 = 16$ that is my answer.

Annotation

Anchor Paper 7
Part A: Score Point 1
This response receives partial credit. The response includes one of the two required elements:

- The correct area of Figure K is provided (21). An incorrect label (feet) is given, but this is not a top score point response so no deduction is taken for the labeling error.

No attempt to explain Joan's mistake is provided.
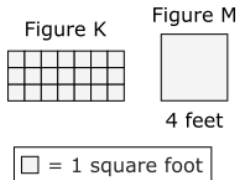
Part B: Score Point 0
This response receives no credit. The response includes none of the two required elements:

No explanation for finding the area of the larger figure is provided. Note that the area and work to find the area of Figure M is provided (4 x 4 = 16), not the area of the combined figure.

The area for the combined figure is not provided.

Figure K is covered with square tiles each measuring 1 square foot. There are no gaps or overlaps in the tiles. Figure M is a square with side lengths of 4 feet.

Figure K   **Figure M**

4 feet

□ = 1 square foot

Part A

Joan said the area of Figure K is found by adding $3 + 7 + 3 + 7$, so the area is 20 square feet. Joan made a mistake in her reasoning.

Explain the mistake Joan made. Find the correct area for Figure K.

21

Part B

Figures K and M are pushed together to form a larger figure. There are no gaps or overlaps of the two figures. To find the area of the larger figure, Andy multiplied the area of Figure K by the area of Figure M. Andy is incorrect in his reasoning.

- Explain the steps Andy should take to find the area of the larger figure.
- What is the area, in square feet, of the larger figure?
- Show your work or explain your answers.

$4 \times 4 = 16$ then $7 \times 3 = 21$.
     16 square feet.   i got this by multiplying

Annotation

Anchor Paper 8
Part A: Score Point 1
This response receives partial credit. The response includes one of the two required elements:

- The correct area is provided (21).

No attempt to explain Joan's mistake is provided.
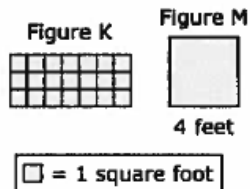
Part B: Score Point 0
This response receives no credit. The response includes none of the two required elements:

The explanation for finding the area is insufficient ($4 \times 4 = 16$ then $7 \times 3 = 21$). The explanation should indicate that the two areas need to be added together to find the area of the combined figure.

No attempt to show the area for the combined figure is provided.

Figure K is covered with square tiles each measuring 1 square foot. There are no gaps or overlaps in the tiles. Figure M is a square with side lengths of 4 feet.

Figure K

Figure M

4 feet

☐ = 1 square foot

Part A

Joan said the area of Figure K is found by adding $3 + 7 + 3 + 7$, so the area is 20 square feet. Joan made a mistake in her reasoning.

Explain the mistake Joan made. Find the correct area for Figure K.

| ⟳ | ↺ | ↻ | ⌫ | + | − | × | ÷ | ▤ | ▥ |
| = | < | > | (·) | ? |

> Her mistake was she forgot to count the m so that wouldn't be her number so it is wrong.

▾ Numbers

0	1	2	3
4	5	6	7
8	9	,	.

▾ Arithmetic and Units

| ≠ | [·] | $ | ° |

Part B

Figures K and M are pushed together to form a larger figure. There are no gaps or overlaps of the two figures. To find the area of the larger figure, Andy multiplied the area of Figure K by the area of Figure M. Andy is incorrect in his reasoning.

- Explain the steps Andy should take to find the area of the larger figure.
- What is the area, in square feet, of the larger figure?
- Show your work or explain your answers.

| ⟳ | ↺ | ↻ | ⌫ | + | − | × | ÷ | ▤ | ▥ |
| = | < | > | (·) | ? |

$16 + 20 = 36$

▾ Numbers

0	1	2	3
4	5	6	7
8	9	,	.

▾ Arithmetic and Units

| ≠ | [·] | $ | ° |

Annotation

Anchor Paper 9
Part A: Score Point 0
This response receives no credit. The response includes none of the two required elements:

The explanation of Joan's mistake is incorrect (she forgot to count the m).

No attempt to show the correct area of Figure K is provided.

Part B: Score Point 0
This response receives no credit. The response includes none of the two required elements:

The attempt to explain finding the area of the larger figure is unclear (16 + 20 = 36). While the area of Figure M is provided, an incorrect area is provided for Figure K (20). It is unclear if the student is providing the perimeter of Figure K instead of the area, and adding the perimeter of one figure to the area of another is not a valid strategy. Additionally, no identification of the areas is provided.

The area for the combined figure is incorrect (36).

Figure K is covered with square tiles each measuring 1 square foot. There are no gaps or overlaps in the tiles. Figure M is a square with side lengths of 4 feet.

Figure K

Figure M

4 feet

☐ = 1 square foot
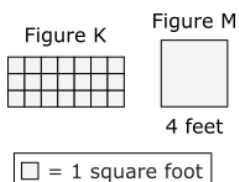
Part A

Joan said the area of Figure K is found by adding $3 + 7 + 3 + 7$, so the area is 20 square feet. Joan made a mistake in her reasoning.

Explain the mistake Joan made. Find the correct area for Figure K.

> You DON'T *round*! you count the tiles on the outside and you would get 16. So the answer would be 16 square feet.

Part B

Figures K and M are pushed together to form a larger figure. There are no gaps or overlaps of the two figures. To find the area of the larger figure, Andy multiplied the area of Figure K by the area of Figure M. Andy is incorrect in his reasoning.

- Explain the steps Andy should take to find the area of the larger figure.
- What is the area, in square feet, of the larger figure?
- Show your work or explain your answers.

> You multiply $11 \times 3 = 33$. Then you do $11 + 4 = 15$
> and you have your answer, 15 is the area of the larger object

Anchor Paper 10
Part A: Score Point 0
This response receives no credit. The response includes none of the two required elements:

The explanation of Joan's mistake is incorrect (You DON'T round! you count the tiles on the outside).

The area provided is incorrect (16).

Part B: Score Point 0
This response receives no credit. The response includes none of the two required elements:

The explanation for finding the area is incorrect (multiply 11 × 3 = 33, 11 + 4 = 15).

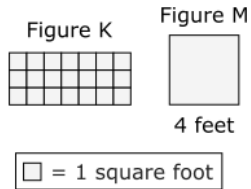The area for the combined figure is incorrect (15).

Practice Set
P1 - P5

No Annotations Included

Figure K is covered with square tiles each measuring 1 square foot. There are no gaps or overlaps in the tiles. Figure M is a square with side lengths of 4 feet.

Figure K   Figure M

4 feet

□ = 1 square foot

Part A

Joan said the area of Figure K is found by adding $3 + 7 + 3 + 7$, so the area is 20 square feet. Joan made a mistake in her reasoning.

Explain the mistake Joan made. Find the correct area for Figure K.

> Joan didn't pay attention to the squares he already counted. Also, he forgot the midile. The correct area is 21.
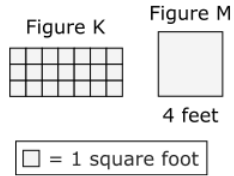
Part B

Figures K and M are pushed together to form a larger figure. There are no gaps or overlaps of the two figures. To find the area of the larger figure, Andy multiplied the area of Figure K by the area of Figure M. Andy is incorrect in his reasoning.

- Explain the steps Andy should take to find the area of the larger figure.
- What is the area, in square feet, of the larger figure?
- Show your work or explain your answers.

> Andy should have found the area of shape m and ADDED it to the area of shape k. The area of the shape is 37.

Figure K is covered with square tiles each measuring 1 square foot. There are no gaps or overlaps in the tiles. Figure M is a square with side lengths of 4 feet.

Figure K   Figure M

4 feet

☐ = 1 square foot

Part A

Joan said the area of Figure K is found by adding $3 + 7 + 3 + 7$, so the area is 20 square feet. Joan made a mistake in her reasoning.

Explain the mistake Joan made. Find the correct area for Figure K.

Joan mistake is the answer is 21 because you can multilpy
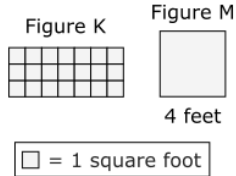$3 \times 7 = 21$

Part B

Figures K and M are pushed together to form a larger figure. There are no gaps or overlaps of the two figures. To find the area of the larger figure, Andy multiplied the area of Figure K by the area of Figure M. Andy is incorrect in his reasoning.

- Explain the steps Andy should take to find the area of the larger figure.
- What is the area, in square feet, of the larger figure?
- Show your work or explain your answers.

first,Andy did is count counted one square foot.then,Andy added the shapes together.After that,ANdy counted the shapes all together.Also,the figure that could be added will be 37 square feet.

Figure K is covered with square tiles each measuring 1 square foot. There are no gaps or overlaps in the tiles. Figure M is a square with side lengths of 4 feet.

Figure K   Figure M

4 feet

□ = 1 square foot

Part A

Joan said the area of Figure K is found by adding $3 + 7 + 3 + 7$, so the area is 20 square feet. Joan made a mistake in her reasoning.

Explain the mistake Joan made. Find the correct area for Figure K.

> Adding the lengths of a figure is how to get the perimeter. In order to get the area of a figure is base □ $\times$ □ height. Figure K would be 3×7 so the area would be 21 square feet.
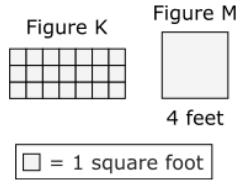
Part B

Figures K and M are pushed together to form a larger figure. There are no gaps or overlaps of the two figures. To find the area of the larger figure, Andy multiplied the area of Figure K by the area of Figure M. Andy is incorrect in his reasoning.

- Explain the steps Andy should take to find the area of the larger figure.
- What is the area, in square feet, of the larger figure?
- Show your work or explain your answers.

> First Andy should find out the areas of the 2 shapes. Then, Andy should add the 2 areas, $16 + 21$ and get 37 square feet. So the area of the larger figure is 37 square feet.

Figure K is covered with square tiles each measuring 1 square foot. There are no gaps or overlaps in the tiles. Figure M is a square with side lengths of 4 feet.

Figure K

Figure M

4 feet

☐ = 1 square foot

Part A

Joan said the area of Figure K is found by adding $3 + 7 + 3 + 7$, so the area is 20 square feet. Joan made a mistake in her reasoning.

Explain the mistake Joan made. Find the correct area for Figure K.

> Joan said how to find the primater. To find the area you have to multiply length times with. In this problem you have to multiply 3 times 7 which equals 21. Thats how you find the area.
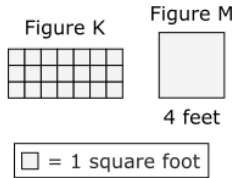
Part B

Figures K and M are pushed together to form a larger figure. There are no gaps or overlaps of the two figures. To find the area of the larger figure, Andy multiplied the area of Figure K by the area of Figure M. Andy is incorrect in his reasoning.

- Explain the steps Andy should take to find the area of the larger figure.
- What is the area, in square feet, of the larger figure?
- Show your work or explain your answers.

> Andy should add the areas .

Figure K is covered with square tiles each measuring 1 square foot. There are no gaps or overlaps in the tiles. Figure M is a square with side lengths of 4 feet.

Figure K   Figure M

4 feet

☐ = 1 square foot

Part A

Joan said the area of Figure K is found by adding $3 + 7 + 3 + 7$, so the area is 20 square feet. Joan made a mistake in her reasoning.

Explain the mistake Joan made. Find the correct area for Figure K.

> You are not soppost to do three plus seven plus three plus seven you are sopposto do 7×3

Part B

Figures K and M are pushed together to form a larger figure. There are no gaps or overlaps of the two figures. To find the area of the larger figure, Andy multiplied the area of Figure K by the area of Figure M. Andy is incorrect in his reasoning.

- Explain the steps Andy should take to find the area of the larger figure.
- What is the area, in square feet, of the larger figure?
- Show your work or explain your answers.

> You have to do 4×4 then you have to do 16 plus 21

Practice Set

Paper	Score
P1	1,2
P2	1,1
P3	2,2
P4	2,1
P5	1,1