

GRADE 5 – MODULE 5: PARENT GUIDE

Addition and Multiplication with Volume and Area

- Each day in class, we do practice sets. Attached are the answer keys to the Practice Sets from this module. These answer keys can be used to refresh your child’s memory of work we did together in class and help you support your child with the math homework. There is a footer at the end of each answer key that tells you the lesson number. This lesson number corresponds with the lesson number on the homework sheets.

Module 5 Contents:

Topic A	Lessons 1 - 3
Topic B	Lessons 4 - 9
Topic C	Lessons 10 – 15
Topic D	Lessons 16 - 21

Name Kenny

Date _____

1. Use your centimeter cubes to build the figures pictured below on centimeter grid paper. Find the total volume of each figure you built and explain how you counted the cubic units. Be sure to include units.

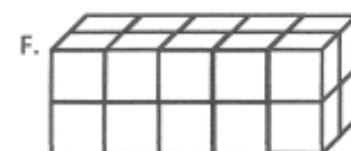
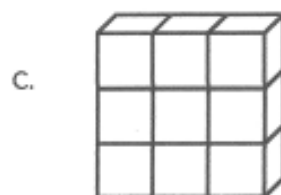
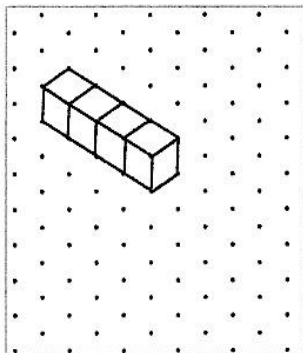


Figure	Volume	Explanation
A	1 cm^3	I just counted one cube.
B	5 cm^3	I added 3 cubes and 2 cubes.
C	9 cm^3	I multiplied 3 layers \times 3 cubes.
D	7 cm^3	I counted each cube.
E	12 cm^3	I counted the bottom layer, and then multiplied by 2.
F	20 cm^3	I found one layer, then multiplied by 2.

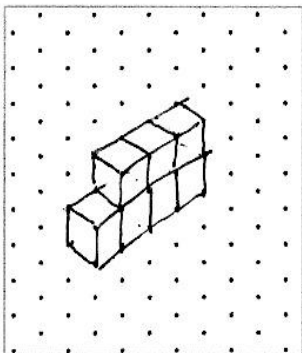


2. Build 2 different structures with the following volumes using your cubic units. Then draw one of the figures on the dot paper. One example has been drawn for you.

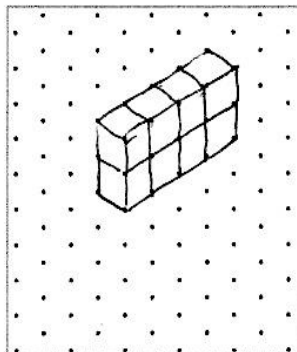
a. 4 cubic units



b. 7 cubic units

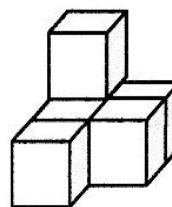


c. 8 cubic units



3. Joyce says that this figure, made of 1 cm cubes, has a volume of 5 cubic centimeters. Explain her mistake.

Joyce is not counting the one that is hidden. The cube that's on the second layer needs to be sitting on a hidden cube.

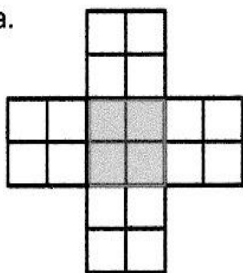


4. Imagine that Joyce made the second layer of her structure identical to the first. What would its volume be then? Explain how you know.

10cm^3 I counted the first layer, and then multiplied by 2.

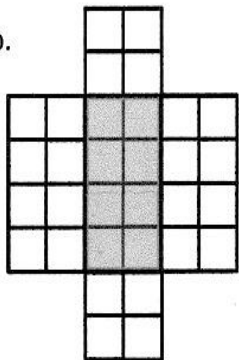
1. Shade the following figures on centimeter grid paper. Cut and fold each to make 3 open boxes, taping them so they hold their shapes. Pack each box with cubes. Write how many cubes fill the box.

a.



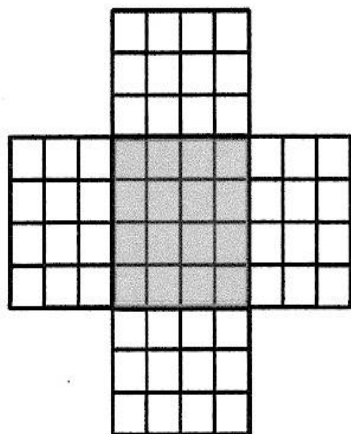
Number of cubes: 8

b.



Number of cubes: 16

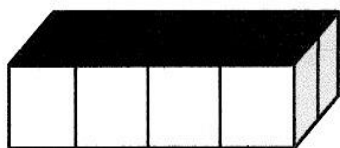
c.



Number of cubes: 48

2. Predict how many centimeter cubes will fit in each box and briefly explain your prediction. Use cubes to find the actual volume. (The figures are not drawn to scale.)

a.



It's 4 cubes across and 2 deep, so 8 cubes altogether.

Prediction: 8 cm³

Actual: 8 cm³



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Lesson 2:

Date:

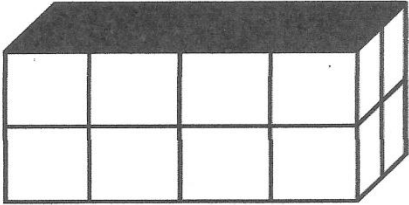
Find the volume of a right rectangular prism by packing with cubic units and counting.

12/12/13

engage^{ny}

5.A.21

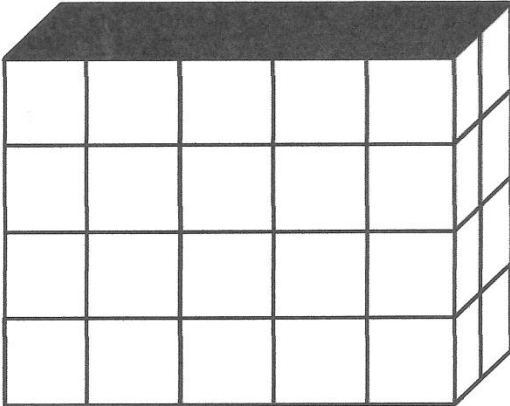
B.



Prediction: 16 cm³

Actual: 16 cm³

C.



Prediction: 40 cm³

Actual: 40 cm³

3. Cut out the net in the template and fold it into a cube. Predict the number of 1-centimeter cubes that would be required to fill it. Test your prediction using as few cubes as possible. What did you discover?

Prediction: 1 cube

What I discovered:

I saw that the net had six faces, so I knew it would not be an open box. When I folded the net, I discovered it had the shape of a cube.

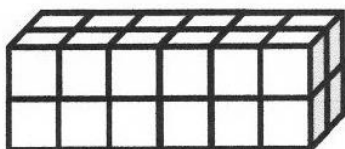
Name Georgie

Date _____

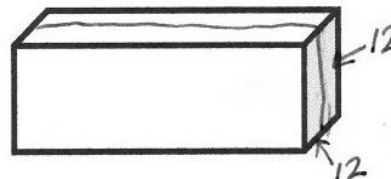
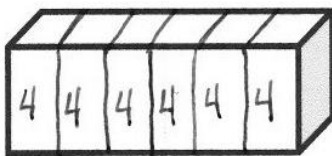
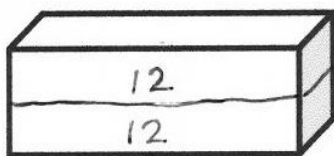
1. Use the prisms to find the volume.

- Build the rectangular prism pictured to the left with your cubes, if necessary.
- Decompose it into layers in 3 different ways and show your thinking on the blank prisms.
- Complete the missing information in the table.

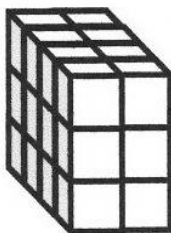
a.



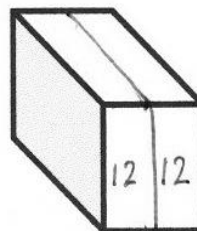
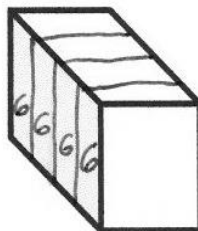
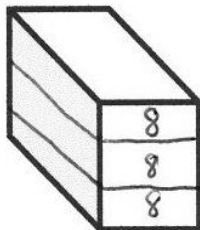
Number of Layers	Number of Cubes in Each Layer	Volume of the Prism
2	12	24 cubic cm
6	4	24 cubic cm
2	12	24 cubic cm



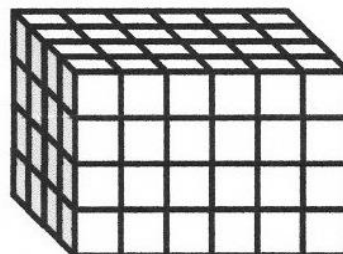
b.



Number of Layers	Number of Cubes in Each Layer	Volume of the Prism
3	8	24 cubic cm
4	6	24 cubic cm
2	12	24 cubic cm



2. Josh and Jonah were finding the volume of the prism to the right. The boys agree that 4 layers can be added together to find the volume. Josh says that he can see on the end of the prism that each layer will have 16 cubes in it. Jonah says that each layer has 24 cubes in it. Who is right? Explain how you know using words, numbers, and/or pictures.

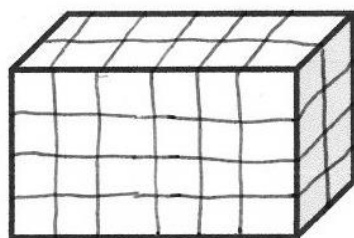


Jonah is right. Each layer has 6 across and 4 deep, so 24 cubes in each layer. 24×4 is 96. Josh sees 16 cubes on the end layer, but he'd have to multiply by 6 going across, not 4. He would get $16 \times 4 = 64$, not 96, so only Jonah is right.

3. Marcos makes a prism 1 inch by 5 inches by 5 inches. He then decides to create layers equal to his first one. Fill in the chart below and explain how you know the volume of each new prism.

Number of Layers	Volume	Explanation
2	50 in^3	Each layer is 25 in^3 . 2 layers is $2 \times 25 \text{ in}^3 = 50 \text{ in}^3$.
4	100 in^3	4 layers is double 2 layers, so $2 \times 50 \text{ in}^3 = 100 \text{ in}^3$.
7	175 in^3	1 multiplied 1 layer (25 in^3) by 7. $7 \times 25 \text{ in}^3 = 175 \text{ in}^3$

4. Imagine the rectangular prism below is 6 meters long, 4 meters tall, and 2 meters wide. Draw horizontal lines to show how the prism could be decomposed into layers that are 1 meter in height.



It has 4 layers from bottom to top.

Each layer contains 12 cubic units.

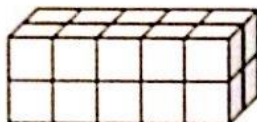
The volume of this prism is 48 m^3 .

Name Kathy

Date _____

1. Each rectangular prism is built from centimeter cubes. State the dimensions and find the volume.

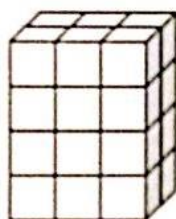
a.

Length: 5 cmWidth: 2 cmHeight: 2 cmVolume: 20 cm³

$$5 \times 2 \times 2$$

$$10 \times 2 = 20$$

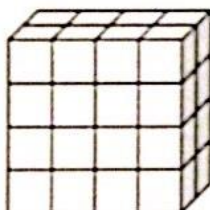
b.

Length: 3 cmWidth: 2 cmHeight: 4 cmVolume: 24 cm³

$$3 \times 2 \times 4$$

$$6 \times 4 = 24$$

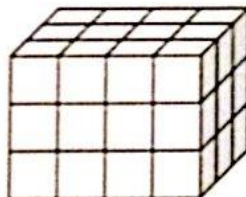
c.

Length: 4 cmWidth: 2 cmHeight: 4 cmVolume: 32 cm³

$$4 \times 2 \times 4$$

$$8 \times 4 = 32$$

d.

Length: 4 cmWidth: 3 cmHeight: 3 cmVolume: 36 cm³

$$4 \times 3 \times 3$$

$$12 \times 3 = 36$$

2. Write a multiplication sentence that you could use to calculate the volume for each rectangular prism in exercise #1. Please include the units in your sentences.

a. $5\text{ cm} \times 2\text{ cm} \times 2\text{ cm} = 20\text{ cm}^3$ b. $3\text{ cm} \times 2\text{ cm} \times 4\text{ cm} = 24\text{ cm}^3$

c. $4\text{ cm} \times 2\text{ cm} \times 4\text{ cm} = 32\text{ cm}^3$ d. $4\text{ cm} \times 3\text{ cm} \times 3\text{ cm} = 36\text{ cm}^3$

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Lesson 4:

Date:

Use multiplication to calculate volume.

11/8/13

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5.B.9

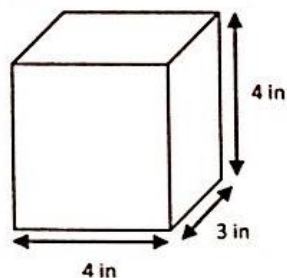


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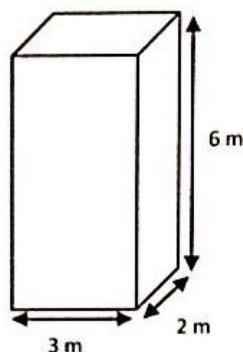
3. Calculate the volume of each rectangular prism. Include the units in your number sentences.

a.



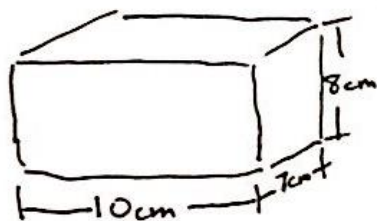
$$V = 4\text{ in} \times 3\text{ in} \times 4\text{ in} = 48\text{ in}^3$$

b.



$$V = 3\text{ m} \times 2\text{ m} \times 6\text{ m} = 36\text{ m}^3$$

4. Tyron is constructing a box in the shape of a rectangular prism to store his baseball cards. It has a length of 10 centimeters, a width of 7 centimeters, and a height of 8 centimeters. What is the volume of the box?

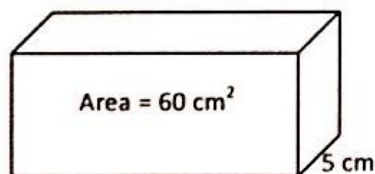


$$\begin{aligned} V &= l \times w \times h \\ &= 10\text{ cm} \times 7\text{ cm} \times 8\text{ cm} \\ &= 70\text{ cm}^2 \times 8\text{ cm} \\ V &= 560\text{ cm}^3 \end{aligned}$$

The volume of the box is 560 cubic cm.

5. Aaron says more information is needed to find the volume of the prisms. Explain why Aaron is mistaken and calculate the volume of the prisms.

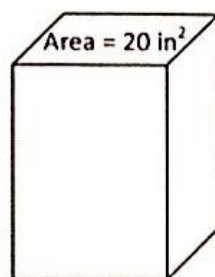
a.



Aaron can multiply the area (60 cm^2) by the width

$$V = 60\text{ cm}^2 \times 5\text{ cm} = 300\text{ cm}^3$$

b.



Aaron can multiply the area (20 in^2) by the height.

$$\begin{aligned} V &= 20\text{ in}^2 \times 12\text{ in} \\ V &= 240\text{ in}^3 \end{aligned}$$



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Lesson 4:
Date:

Use multiplication to calculate volume.
11/8/13

engage^{ny}

5.B.10

Name Chrissy

Date _____

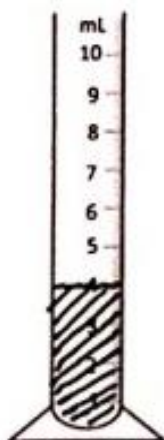
1. Determine the volume of two boxes on the table using cubes and then confirm by measuring and multiplying.

Box Number:	Number of cubes packed:	Measurements:			Volume:
		Length	Width	Height	
1	32	4 cm	4 cm	2 cm	32 cm ³
2	20	2 cm	5 cm	2 cm	20 cm ³

2. Using the same boxes from #1, record the amount of liquid that your box can hold.

Box Number:	Liquid the box can hold
1	32 mL
2	20 mL

3. Shade to show the water in the beaker.



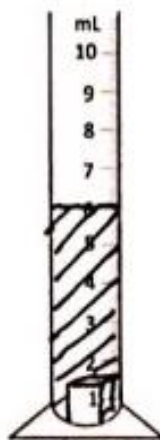
At first:

4 mL



After 1 mL water added:

5 mL



After 1 cm cube added:

6 mL



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Lesson 5:

Date:

Use multiplication to connect volume as packing with volume as filling.

11/8/13

engage^{ny}

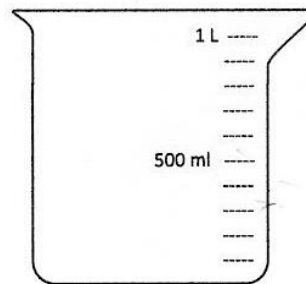
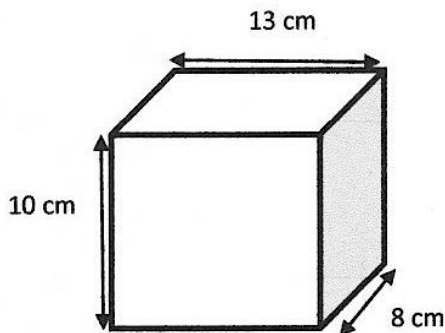
5.B.8

4. What conclusion can you draw about 1 cubic centimeter and 1 mL?

When 1 cubic centimeter is added, the water level rises 1 mL. Therefore, 1 cubic cm is equal to 1 mL.

$$1 \text{ cm}^3 = 1 \text{ mL}$$

5. The tank, shaped like a rectangular prism, is filled to the top with water.



$$1 \text{ L} = 1,000 \text{ mL}$$

Will the beaker hold all the water in the box? If yes, how much more will the beaker hold? If not, how much more will the cube hold than the beaker? Explain how you know.

$V = 10 \text{ cm} \times 8 \text{ cm} \times 13 \text{ cm} = 1,040 \text{ cm}^3$ No, the beaker holds 40 mL less than the cube. $1 \text{ L} = 1,000 \text{ mL}$, and $1,040 \text{ cm}^3 = 1,040 \text{ mL}$. 1,040 mL is 40 more than 1,000 mL.

6. A rectangular fish tank measures 26 cm by 20 cm by 18 cm. The tank is filled with water to a depth of 15 cm.

- a. What is the volume of the water in mL?

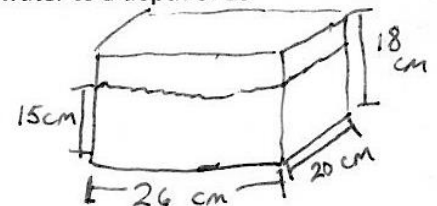
$$26 \text{ cm} \times 20 \text{ cm} \times 15 \text{ cm} =$$

$$520 \text{ cm}^2 \times 15 \text{ cm} = 7,800 \text{ cm}^3 = 7,800 \text{ mL}$$

- b. How many liters is that?

$$7,800 \text{ mL} \div 1,000 = 7.8 \text{ L}$$

$$\begin{array}{r} 520 \\ \times 15 \\ \hline 2600 \\ 5200 \\ \hline 7800 \end{array}$$



- c. How many more mL of water will be needed to fill the tank to the top? Explain how you know.

$3 \text{ cm} \times 20 \text{ cm} \times 26 \text{ cm} =$ The remaining part is 3 cm \times 20 cm \times 26 cm. $78 \text{ cm}^2 \times 20 \text{ cm} = 1,560 \text{ cm}^3$ 1 multiplied to find the volume there is left to fill. $1,560 \text{ mL}$

- d. A rectangular container is 25 cm long and 20 cm wide. If it holds 1 liter of water when full, what is its height?

$$25 \text{ cm} \times 20 \text{ cm} = 500 \text{ cm}^2$$

$$1 \text{ L} = 1,000 \text{ cm}^3$$

$$1,000 \text{ cm}^3 \div 500 \text{ cm}^2 = 2 \text{ cm}$$

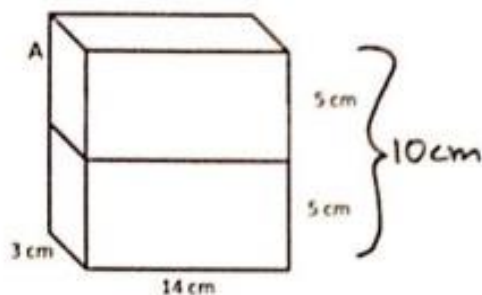
It is 2 cm high.

Name Michele

Date _____

1. Find the total volume of the figures and record your solution strategy.

a.

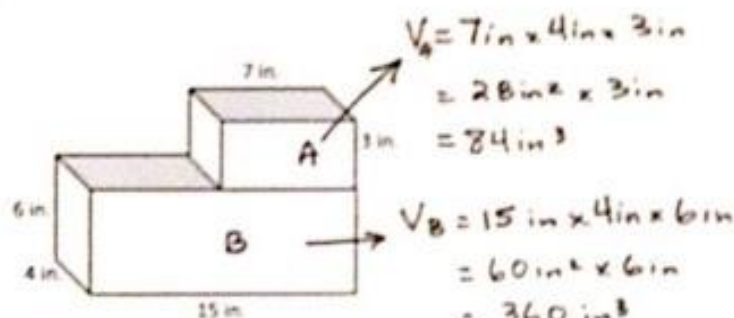


Volume: $V = 14\text{ cm} \times 3\text{ cm} \times 10\text{ cm} = 420\text{ cm}^3$

Solution Strategy:

I combined the 2 heights to get 10 cm. Then I just used the formula for V .

b.



$$\begin{aligned} V_A &= 7\text{ in} \times 4\text{ in} \times 3\text{ in} \\ &= 28\text{ in}^2 \times 3\text{ in} \\ &= 84\text{ in}^3 \end{aligned}$$

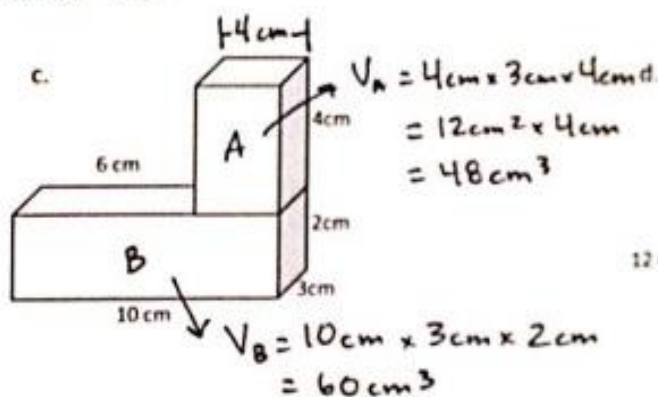
$$\begin{aligned} V_B &= 15\text{ in} \times 4\text{ in} \times 6\text{ in} \\ &= 60\text{ in}^2 \times 6\text{ in} \\ &= 360\text{ in}^3 \end{aligned}$$

Volume: $360\text{ in}^3 + 84\text{ in}^3 = 444\text{ in}^3$

Solution Strategy:

Prism A & B have the same width, so I used the V formula & then added the 2 volumes to find the total.

c.



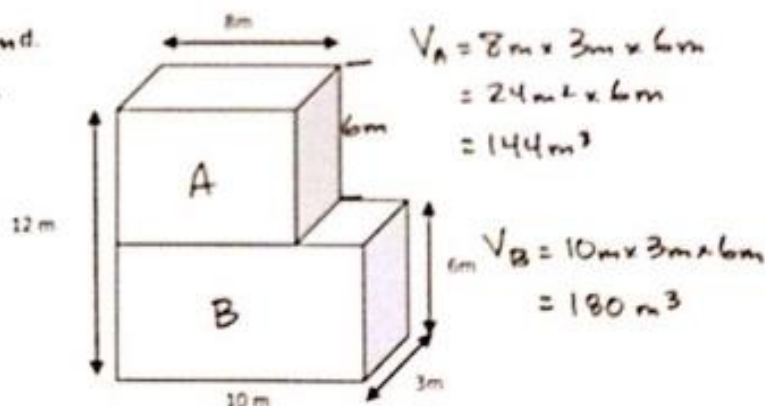
$$\begin{aligned} V_A &= 4\text{ cm} \times 3\text{ cm} \times 4\text{ cm} \\ &= 12\text{ cm}^2 \times 4\text{ cm} \\ &= 48\text{ cm}^3 \end{aligned}$$

$$\begin{aligned} V_B &= 10\text{ cm} \times 3\text{ cm} \times 2\text{ cm} \\ &= 60\text{ cm}^3 \end{aligned}$$

Volume: $60\text{ cm}^3 + 48\text{ cm}^3 = 108\text{ cm}^3$

Solution Strategy:

$10\text{ cm} - 6\text{ cm}$ shows that the length of A is 4 cm. Then I found the volume of A & B and added them together.



$$\begin{aligned} V_A &= 8\text{ m} \times 3\text{ m} \times 6\text{ m} \\ &= 24\text{ m}^2 \times 6\text{ m} \\ &= 144\text{ m}^3 \end{aligned}$$

$$\begin{aligned} V_B &= 10\text{ m} \times 3\text{ m} \times 6\text{ m} \\ &= 180\text{ m}^3 \end{aligned}$$

Volume: $180\text{ m}^3 + 144\text{ m}^3 = 324\text{ m}^3$

Solution Strategy:

$12\text{ m} - 6\text{ m}$ shows that the height of A is 6 m. Again, I found the volume of each prism then added them together.

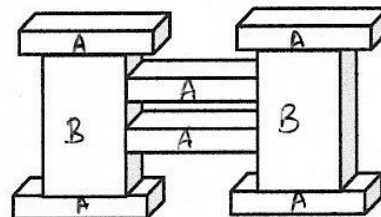
2. A sculpture (pictured below) is made of two sizes of rectangular prisms. One size measures 13 in by 8 in by 2 in. The other size measures 9 in by 8 in by 18 in. What is the total volume of the sculpture?

$$V_A = 13 \text{ in} \times 8 \text{ in} \times 2 \text{ in} \\ = 208 \text{ in}^3$$

$$V_B = 9 \text{ in} \times 8 \text{ in} \times 18 \text{ in} \\ = 72 \text{ in}^2 \times 18 \text{ in} \\ = 1296 \text{ in}^3$$

$$\begin{array}{r} 208 \text{ in}^3 \\ \times 6 \\ \hline 1,248 \text{ in}^3 \\ 1296 \text{ in}^3 \\ \times 2 \\ \hline 2,592 \text{ in}^3 \end{array}$$

$$\begin{array}{r} 1,248 \\ + 2,592 \\ \hline 3,840 \end{array}$$



$$V = 3,840 \text{ in}^3$$

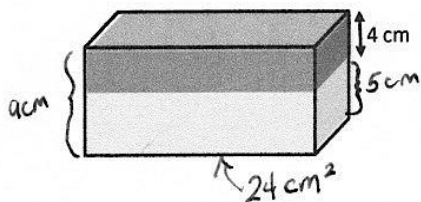
3. The combined volume of two identical cubes is 128 cubic centimeters. What is the side length of each cube?

Volume $\begin{array}{|c|c|} \hline 64 & 64 \\ \hline \end{array}$

$$4 \times 4 \times 4 = 64$$

Each side length on each cube is 4 cm.

4. A rectangular tank with a base area of 24 cm^2 is filled with water and oil to a depth of 9 cm. The oil and water separate into two layers when the oil rises to the top. If the thickness of the oil layer is 4 cm, what is the volume of the water?



$$24 \text{ cm}^2 \times 5 \text{ cm} = 120 \text{ cm}^3$$

The volume of the water is 120 cm^3 .

5. Two rectangular prisms have a combined volume of 432 cubic feet. Prism A has half the volume of Prism B.

- a. What is the volume of Prism A? Prism B?

$$\text{Volume of A: } 144 \text{ ft}^3$$

$$\text{Volume of B: } 288 \text{ ft}^3$$

- b. If Prism A has a base area of 24 ft^2 , what is the height of Prism A?

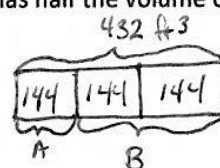
$$144 \div 12 = 12, \text{ so } 144 \div 24 = 6. \text{ The height of A is 6 ft.}$$

- c. If Prism B's base is $\frac{2}{3}$ the area of Prism A's base, what is the height of Prism B?

$$\frac{2}{3} \times 24 = \frac{2 \times 24}{3} = 16$$

$$288 \text{ ft}^3 \div 16 \text{ ft}^2 = 18 \text{ ft}$$

The height of B is 18 ft.



$$\begin{array}{r} 432 \text{ ft}^3 \\ 3 \overline{) 432} \\ \underline{3} \\ 13 \\ \underline{12} \\ 12 \\ \underline{12} \\ 0 \end{array}$$

$$\begin{array}{r} 18 \\ 16 \overline{) 288} \\ \underline{16} \\ 128 \\ \underline{128} \\ 0 \end{array}$$

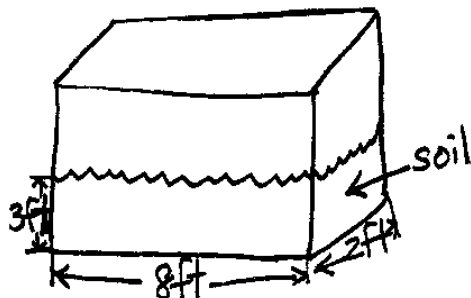
Name Joe

Date _____

Solve.

Geoffrey builds rectangular planters.

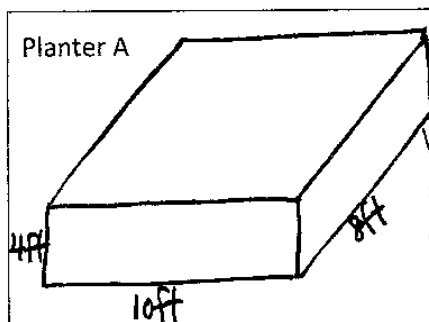
- Geoffrey's first planter is 8 feet long and 2 feet wide. The container is filled with soil to a height of 3 feet in the planter. What is the volume of soil in the planter? Explain your work using a diagram.



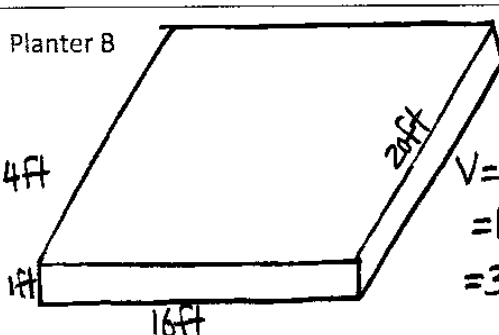
$$\begin{aligned} V &= L \times W \times H \\ &= 8\text{ft} \times 2\text{ft} \times 3\text{ft} \\ &= 48\text{ft}^3 \end{aligned}$$

There is 48ft^3 of soil in the planter.

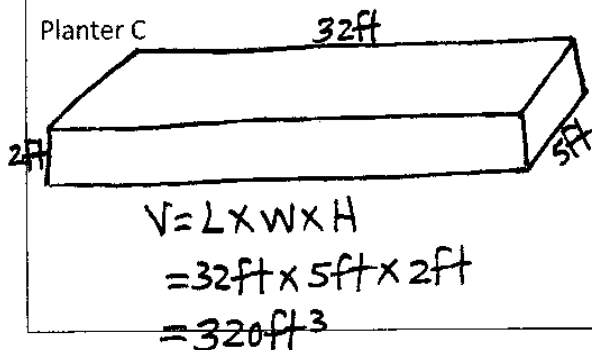
- Geoffrey wants to grow some tomatoes in four large planters. He wants each planter to have a volume of 320 cubic feet, but he wants them all to be different. Show four different ways Geoffrey can make these planters, and draw diagrams with the planters' measurements on them.



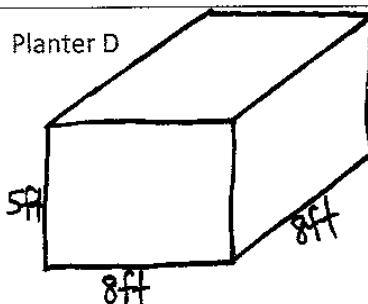
$$\begin{aligned} V &= L \times W \times H \\ &= 10\text{ft} \times 8\text{ft} \times 4\text{ft} \\ &= 320\text{ft}^3 \end{aligned}$$



$$\begin{aligned} V &= L \times W \times H \\ &= 16\text{ft} \times 20\text{ft} \times 1\text{ft} \\ &= 320\text{ft}^3 \end{aligned}$$

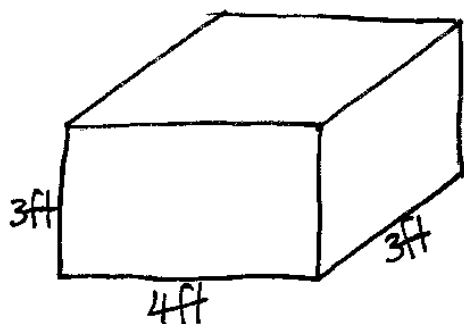


$$\begin{aligned} V &= L \times W \times H \\ &= 32\text{ft} \times 5\text{ft} \times 2\text{ft} \\ &= 320\text{ft}^3 \end{aligned}$$



$$\begin{aligned} V &= L \times W \times H \\ &= 8\text{ft} \times 8\text{ft} \times 5\text{ft} \\ &= 320\text{ft}^3 \end{aligned}$$

3. Geoffrey wants to make one planter that extends from the ground to just below his back window. The window starts 3 feet off the ground. If he wants the planter to hold 36 cubic feet of soil, name one way he could build the planter so it is not taller than 3 feet. Explain how you know.



$$36 \div 3 = 12$$

$$12 = 4 \times 3$$

$$\begin{aligned} V &= L \times W \times H \\ &= 4\text{ft} \times 3\text{ft} \times 3\text{ft} \\ &= 36\text{ft}^3 \end{aligned}$$

Since Geoffrey wants to build a planter with a height of 3ft & a volume of 36ft^3 , the base of the planter should have an area of 12ft^2 . I drew a planter with $L=4\text{ft}$, $W=3\text{ft}$, $H=3\text{ft}$.

4. After all of this gardening work, Geoffrey decides he needs a new shed to replace the old one. His current shed is a rectangular prism that measures 6 feet long by 5 feet wide by 8 feet high. He realizes he needs a shed with 480 cubic feet of storage.

- a. Will he achieve his goal if he doubles each dimension? Why or why not?

$$\begin{aligned} \text{Shed: } V &= 6\text{ft} \times 5\text{ft} \times 8\text{ft} \\ &= 240\text{ft}^3 \end{aligned}$$

$$\begin{aligned} \text{Shed dimensions doubled: } V &= 240\text{ft}^3 \times 8 \\ &= 1,920\text{ft}^3 \end{aligned}$$

By doubling each dimension of the shed, Geoffrey will get a shed that is 8 times the current size because $(2 \times 2 \times 2 = 8)$. To double the volume he needs only to double one dimension, not all three.

- b. If he wants to keep the height the same, what could the other dimensions be for him to get the volume he wants?

He could double the length and keep the width the same. OR he could double the width and keep the length the same.

$$L = 12\text{ft}$$

$$W = 5\text{ft}$$

$$H = 8\text{ft}$$

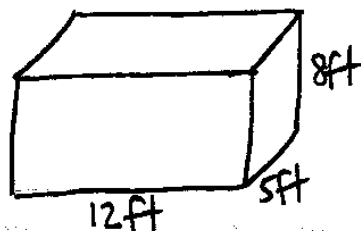
OR

$$L = 6\text{ft}$$

$$W = 10\text{ft}$$

$$H = 8\text{ft}$$

- c. If he uses the dimensions in part (b), what could be the area of the new shed's floor?



$$\begin{aligned} A &= L \times W \\ &= 12\text{ft} \times 5\text{ft} \\ &= 60\text{ft}^2 \end{aligned}$$

The floor could have an area of 60ft^2 .

Name Alex Date _____

Using the box patterns, construct a sculpture containing at least 5 but not more than 7 rectangular prisms that meets the following requirements in the table below.

1.	My sculpture has 5 to 7 rectangular prisms. Number of prisms: <u>6</u>	
2.	Each prism is labeled with a letter, dimensions, and volume.	
	Prism A <u>10</u> by <u>7</u> by <u>3</u> Volume <u>210 cm³</u> Prism B <u>9</u> by <u>5</u> by <u>4</u> Volume <u>180 cm³</u> Prism C <u>6</u> by <u>3</u> by <u>4</u> Volume <u>72 cm³</u> Prism D <u>5</u> by <u>2</u> by <u>9</u> Volume <u>90 cm³</u> Prism E <u>5</u> by <u>2</u> by <u>7</u> Volume <u>70 cm³</u> Prism F <u>4</u> by <u>3</u> by <u>1</u> Volume <u>12 cm³</u> Prism <u> </u> by <u> </u> by <u> </u> Volume <u> </u>	
3.	Prism D has $\frac{1}{2}$ the volume of prism <u>B</u> .	Prism D Volume = <u>90 cm³</u> Prism <u>B</u> Volume = <u>180 cm³</u>
4.	Prism E has $\frac{1}{3}$ the volume of prism <u>A</u> .	Prism E Volume = <u>70 cm³</u> Prism <u>A</u> Volume = <u>210 cm³</u>
5.	The total volume of all the prisms is 1,000 cubic centimeters or less.	Total volume: <u>634 cm³</u> Show calculations: <div style="text-align: right;"> $\begin{array}{r} 210 \\ 180 \\ 72 \\ 90 \\ 70 \\ 12 \\ \hline 634 \end{array}$ </div>



Name Roberta

Date _____

I reviewed project number 21.

Use the rubric below to evaluate your friend's project. Ask questions and measure the parts to determine whether he or she has all the required elements. Respond to the prompt in italics in the third column. The final column can be used to write something you find interesting about that element if you like.

Space is provided beneath the rubric for your calculations.

	Requirement	Element present? (✓)	Specifics of Element	Notes
1	Sculpture has 5 to 7 prisms.	✓	# of prisms: 6	
2	All prisms are labeled with a letter.	✓	Write letters used: A - F	
3	All prisms have correct dimensions with units written on the top.	✓	List any prisms with incorrect dimensions or units:	
4	All prisms have correct volume with units written on top.	✓	List any prism with incorrect dimensions or units:	
5	Prism D has $\frac{1}{2}$ the volume of another prism.	✓	Record on next page:	
6	Prism E has $\frac{1}{3}$ the volume of another prism.	✓	Record on next page:	
7	The total volume of all the parts together is 1,000 cubic units or less.	✓	Total volume: 634 cm ³	

Calculations:

$$210 + 180 + 72 + 90 + 70 + 12 = 634$$



Lesson 9:

Apply concepts and formulas of volume to design a sculpture using rectangular prisms within given parameters.

Date:

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8. Measure the dimensions of each prism. Calculate the volume of each prism and the total volume. Record that information in the table below. If your measurements or volume differ from those listed on the project, put a star by the prism label in the table below and record on the rubric.

Prism	Dimensions	Volume
A	10 cm by 7 cm by 3 cm	210 cm ³
B	9 cm by 5 cm by 4 cm	180 cm ³
C	6 cm by 3 cm by 4 cm	72 cm ³
D	5 cm by 2 cm by 9 cm	90 cm ³
E	5 cm by 2 cm by 7 cm	70 cm ³
F	4 cm by 3 cm by 1 cm	12 cm ³
	by by	

9. Prism D's volume is $\frac{1}{2}$ that of Prism B.

Show calculations below.

$$180 \div 2 = 90 \text{ so D's } (90 \text{ cm}^3) \text{ is } \frac{1}{2} \text{ of B's volume } (180 \text{ cm}^3).$$

10. Prism E's volume is $\frac{1}{3}$ that of Prism A.

Show calculations below.

$$210 \div 3 = 70 \text{ so E's volume } (70 \text{ cm}^3) \text{ is } \frac{1}{3} \text{ of A's volume } (210 \text{ cm}^3).$$

11. Total volume of sculpture: 634 cm³

Show calculations below.

$$\begin{array}{r} 210 \\ + 180 \\ \hline 390 \end{array}$$

$$\begin{array}{r} 72 \\ + 90 \\ \hline 162 \end{array}$$

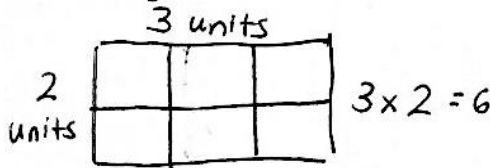
$$\begin{array}{r} 70 \\ + 12 \\ \hline 82 \end{array}$$

$$\begin{array}{r} 390 \\ 162 \\ + 82 \\ \hline 634 \end{array}$$

Name J.J. Date _____

Sketch the rectangles and your tiling. Write the dimensions and the units you counted in the blanks. Then use multiplication to confirm the area. Show your work. We will do Rectangles A and B together.

1. Rectangle A:

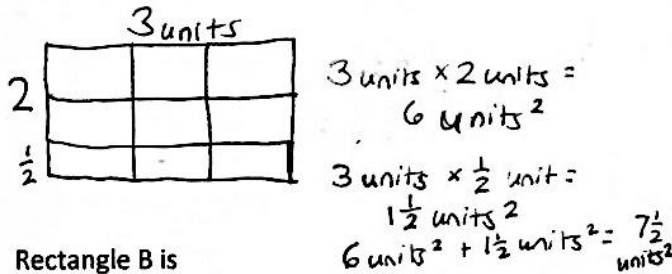


Rectangle A is

3 units long 2 units wide

Area = 6 units²

2. Rectangle B:

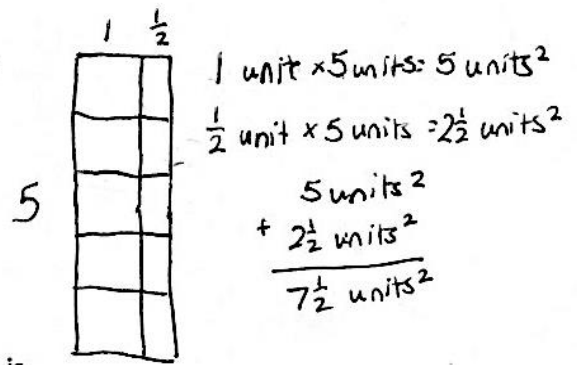


Rectangle B is

3 units long 2 1/2 units wide

Area = 7 1/2 units²

3. Rectangle C:

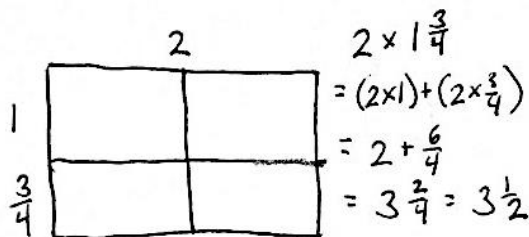


Rectangle C is

5 units long 1 1/2 units wide

Area = 7 1/2 units²

4. Rectangle D:

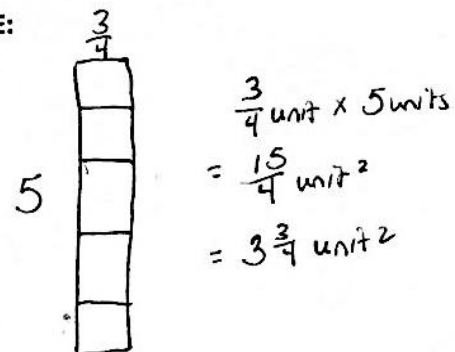


Rectangle D is

2 units long 1 3/4 units wide

Area = 3 1/2 units²

5. Rectangle E:

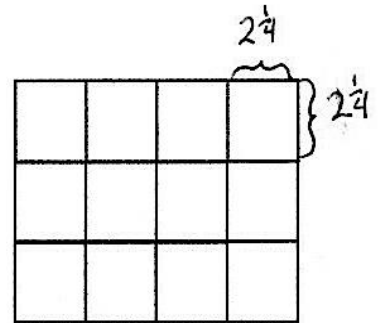


Rectangle E is

5 units long 3/4 units wide

Area = 3 3/4 units²

6. The rectangle to the right is composed of squares that measure $2\frac{1}{4}$ inches on each side. What is its area in square inches? Explain your thinking using pictures and numbers.

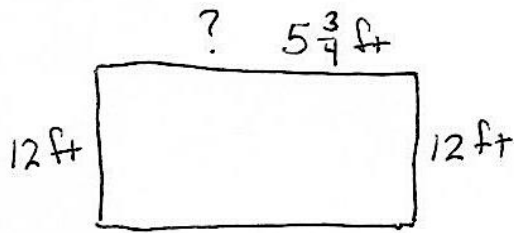


$$\begin{aligned} 2\frac{1}{4} \text{ in} \times 2\frac{1}{4} \text{ in} &= (2 \times 2) + (2 \times \frac{1}{4}) + (\frac{1}{4} \times 2) + (\frac{1}{4} \times \frac{1}{4}) \\ &= 4 + \frac{1}{2} + \frac{1}{2} + \frac{1}{16} \\ &= 5\frac{1}{16} \text{ in}^2 \end{aligned}$$

$$12 \times 5\frac{1}{16} \text{ in}^2 = 60\frac{3}{4} \text{ in}^2$$

First I found the area of one square. Then I multiplied it by the number of squares. The total area is $60\frac{3}{4} \text{ in}^2$.

7. A rectangle has a perimeter of $35\frac{1}{2}$ feet. If the width is 12 ft, what is the area of the rectangle?



$$\text{Perimeter: } 35\frac{1}{2} \text{ ft}$$

$$35\frac{1}{2} - 24 = 11\frac{1}{2} \text{ ft}$$

$$11\frac{1}{2} \div 2 = \frac{23}{2} \times \frac{1}{2} = \frac{23}{4} = 5\frac{3}{4} \text{ ft}$$

$$\begin{aligned} A: & 5\frac{3}{4} \times 12 \\ &= 60 + \frac{36}{4} \\ &= 69 \text{ ft}^2 \end{aligned}$$

The area of the rectangle is 69 ft^2 .

Name Tia

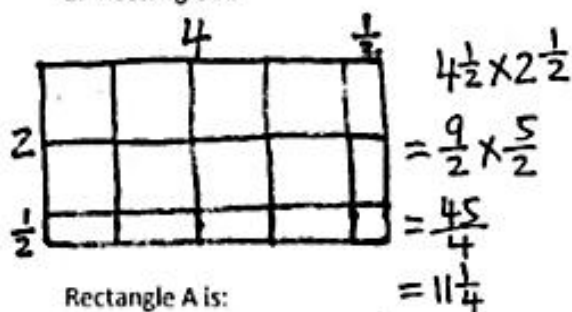
Date _____

Draw the rectangle and your tiling.

Write the dimensions and the units you counted in the blanks.

Then, use multiplication to confirm the area. Show your work.

1. Rectangle A:

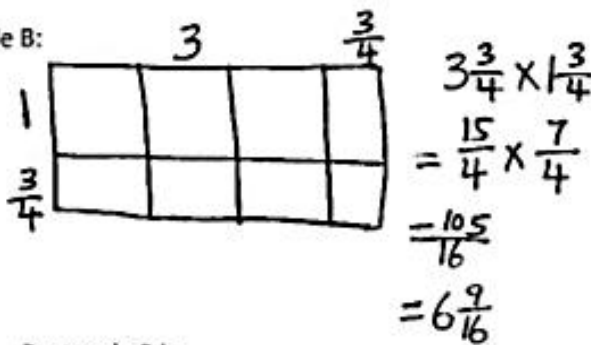


Rectangle A is:

$4\frac{1}{2}$ units long $2\frac{1}{2}$ units wide

Area = $11\frac{1}{4}$ units²

2. Rectangle B:

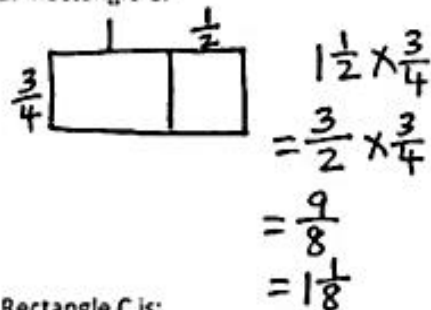


Rectangle B is:

$3\frac{3}{4}$ units long $1\frac{3}{4}$ units wide

Area = $6\frac{9}{16}$ units²

3. Rectangle C:

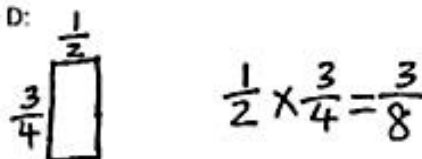


Rectangle C is:

$1\frac{1}{2}$ units long $\frac{3}{4}$ units wide

Area = $1\frac{1}{8}$ units²

4. Rectangle D:



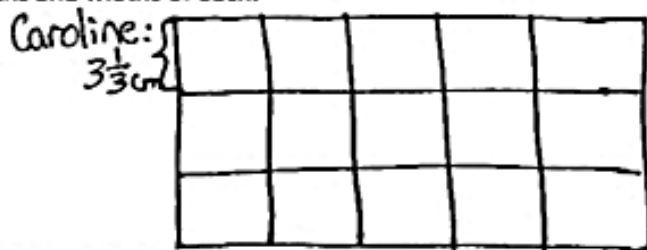
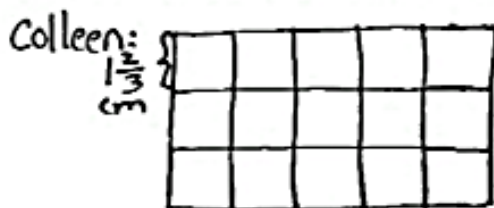
Rectangle D is:

$\frac{3}{4}$ units long $\frac{1}{2}$ units wide

Area = $\frac{3}{8}$ units²



5. Colleen and Caroline each built a rectangle out of square tiles placed in 3 rows of 5. Colleen used tiles that measured $1\frac{2}{3}$ cm squares. Caroline used tiles that measured $3\frac{1}{3}$ cm.
- a. Draw the girls' rectangles and label the lengths and widths of each.



- b. What are the areas of the rectangles in square centimeters?

Colleen: Length = $1\frac{2}{3} \times 5 = 5\frac{10}{3} = 8\frac{1}{3}$
 Width = $1\frac{2}{3} \times 3 = 3\frac{6}{3} = 3$
 $A = L \times W$
 $= 8\frac{1}{3} \times 3$
 $= 40\frac{5}{3} = 41\frac{2}{3} \text{ cm}^2$

Caroline: Length = $3\frac{1}{3} \times 5 = 15\frac{5}{3} = 16\frac{2}{3}$
 Width = $3\frac{1}{3} \times 3 = 9\frac{3}{3} = 10$
 $A = L \times W$
 $= 16\frac{2}{3} \times 10$
 $= 160\frac{20}{3}$
 $= 166\frac{2}{3} \text{ cm}^2$

- c. Compare the area of the rectangles.

The area of Colleen's rectangle is smaller than Caroline's.

$$41\frac{2}{3} \text{ cm}^2 < 166\frac{2}{3} \text{ cm}^2$$

6. A square has a perimeter of 51 inches. What is the area of the square?



Perimeter = 51 in.
 $51 \div 4 = \frac{51}{4} = 12\frac{3}{4}$ in.

$A = L \times W$
 $= 12\frac{3}{4} \times 12\frac{3}{4}$
 $= \frac{51}{4} \times \frac{51}{4}$
 $= \frac{2601}{16}$
 $= 162\frac{9}{16} \text{ in}^2$

The area of the square is $162\frac{9}{16} \text{ in}^2$.

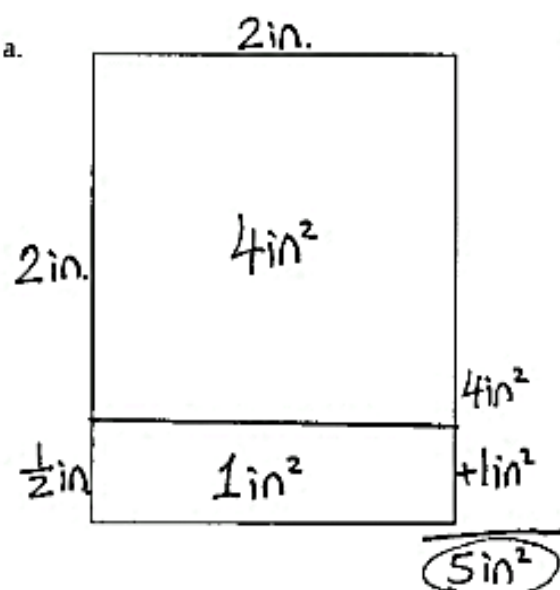
Name

Owen

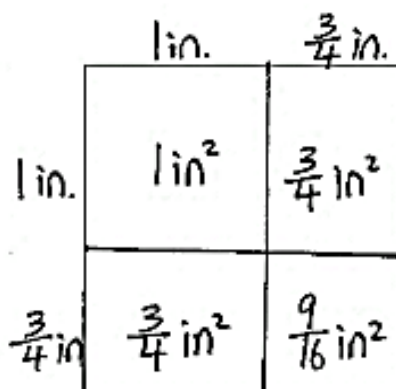
Date

1. Measure each rectangle with your ruler and label the dimensions. Use the area model to find each area.

a.

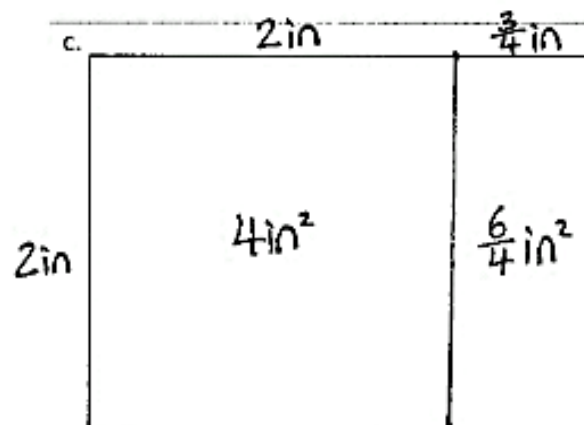


b.



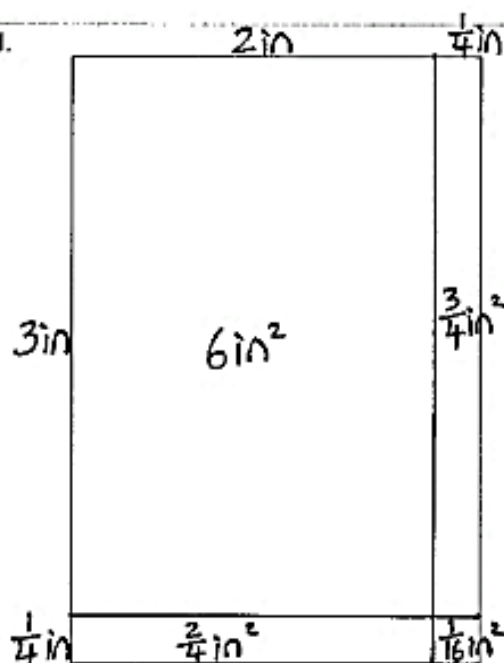
$$1 + \frac{3}{4} + \frac{3}{4} + \frac{9}{16} = 1 + \frac{12}{16} + \frac{12}{16} + \frac{9}{16} = 1 + \frac{33}{16} = 3\frac{1}{16} \text{ in}^2$$

c.



$$4 + \frac{6}{4} = 4 + 1\frac{2}{4} = 5\frac{1}{2} \text{ in}^2$$

d.



$$6 + \frac{3}{4} + \frac{3}{4} + \frac{1}{16} = 6 + \frac{12}{16} + \frac{12}{16} + \frac{1}{16} = 6 + \frac{25}{16} = 7\frac{5}{16} \text{ in}^2$$



COMMON
CORE

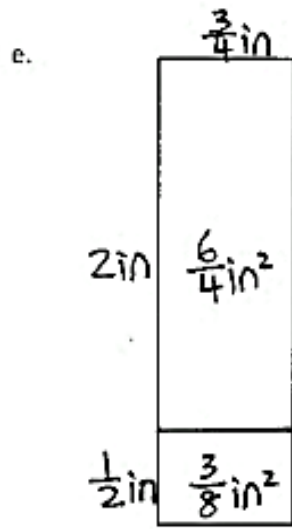
Lesson 12:

Date:

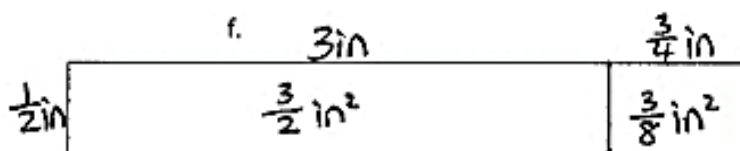
Day 1: Draw rectangles with fractional side lengths using a ruler and set square and find their areas and relate to fraction multiplication.
12/19/13

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$$\begin{aligned} \frac{6}{4} + \frac{3}{8} \\ = \frac{12}{8} + \frac{3}{8} \\ = \frac{15}{8} \\ = 1\frac{7}{8}\text{ in}^2 \end{aligned}$$



$$\begin{aligned} \frac{3}{2} + \frac{3}{8} \\ = \frac{12}{8} + \frac{3}{8} \\ = \frac{15}{8} \\ = 1\frac{7}{8}\text{ in}^2 \end{aligned}$$

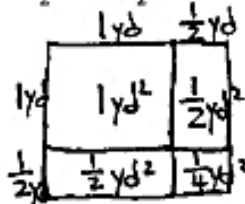
2. Find the area. Explain your thinking using the area model.

a. $1\text{ ft} \times 1\frac{1}{2}\text{ ft}$



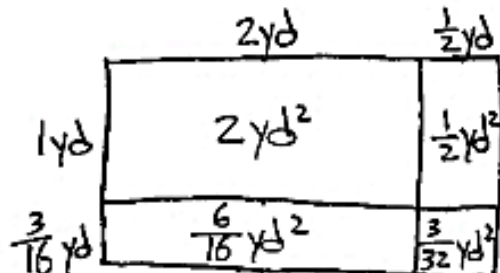
$$1\text{ ft}^2 + \frac{1}{2}\text{ ft}^2 = 1\frac{1}{2}\text{ ft}^2$$

b. $1\frac{1}{2}\text{ yd} \times 1\frac{1}{2}\text{ yd}$



$$\begin{aligned} 1 + \frac{1}{2} + \frac{1}{2} + \frac{1}{4} \\ = 1 + \frac{2}{4} + \frac{2}{4} + \frac{1}{4} \\ = 1 + \frac{5}{4} \\ = 2\frac{1}{4}\text{ yd}^2 \end{aligned}$$

c. $2\frac{1}{2}\text{ yd} \times 1\frac{3}{16}\text{ yd}$



$$\begin{aligned} 2 + \frac{1}{2} + \frac{6}{16} + \frac{3}{32} \\ = 2 + \frac{16}{32} + \frac{12}{32} + \frac{3}{32} \\ = 2 + \frac{31}{32} \\ = 2\frac{31}{32}\text{ yd}^2 \end{aligned}$$

3. Hanley is putting carpet in her house. She wants to carpet her living room, which measures $15 \text{ ft} \times 12\frac{1}{3} \text{ ft}$. She also wants to carpet her dining room, which is $10\frac{1}{4} \text{ ft} \times 10\frac{1}{3} \text{ ft}$. How many square feet of carpet will she need to cover both rooms?

$$\begin{aligned}\text{Living Room:} \\ 15 \times 12\frac{1}{3} \\ = 180\frac{15}{3} \\ = 185 \text{ ft}^2\end{aligned}$$

$$\begin{aligned}\text{Dining Room:} \\ 10\frac{1}{4} \times 10\frac{1}{3} \\ = \frac{41}{4} \times \frac{31}{3} \\ = \frac{1271}{12} \\ = 105\frac{11}{12} \text{ ft}^2\end{aligned}$$

$$185 + 105\frac{11}{12} = \boxed{290\frac{11}{12} \text{ ft}^2}$$

She will need $290\frac{11}{12} \text{ ft}^2$ of carpet to cover both rooms.

4. Fred cut a $9\frac{3}{4}$ inch square of construction paper for an art project. He cut a square from the edge of the big rectangle (pictured below) whose sides measured $3\frac{1}{4}$ inches.

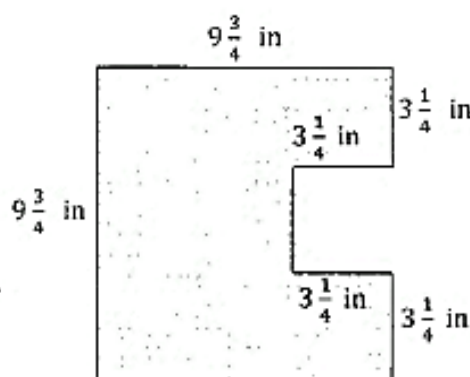
- a. What is the area of the smaller square that Fred cut out?

$$\begin{aligned}A &= L \times W \\ &= 3\frac{1}{4} \times 3\frac{1}{4} \\ &= \frac{13}{4} \times \frac{13}{4} \\ &= \frac{169}{16} = \boxed{10\frac{9}{16} \text{ in}^2}\end{aligned}$$

The area of the smaller square that Fred cut out was $10\frac{9}{16} \text{ in}^2$.

- b. What is the area of the remaining paper?

$$\begin{aligned}\text{Area of large square} &= 9\frac{3}{4} \times 9\frac{3}{4} \\ &= \frac{39}{4} \times \frac{39}{4} \\ &= \frac{1521}{16} = 95\frac{1}{16} \text{ in}^2\end{aligned}$$



The area of the remaining paper is $84\frac{1}{2} \text{ in}^2$.

$$95\frac{1}{16} - 10\frac{9}{16} = 94\frac{17}{16} - 10\frac{9}{16} = 84\frac{8}{16} = \boxed{84\frac{1}{2} \text{ in}^2}$$

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Date

1. Find the area of the following rectangles. Draw an area model if it helps you.

a. $\frac{5}{4} \text{ km} \times \frac{12}{5} \text{ km}$

$$= \frac{5}{4} \times \frac{12}{5}$$

$$= \frac{\cancel{5} \times 12}{4 \times \cancel{5}}$$

$$= 3 \text{ km}^2$$

b. $16\frac{1}{2} \text{ m} \times 4\frac{1}{5} \text{ m}$

$$= \frac{33}{2} \times \frac{21}{5}$$

$$= \frac{693}{10}$$

$$= 69\frac{3}{10} \text{ m}^2$$

c. $4\frac{1}{3} \text{ yd} \times 5\frac{2}{3} \text{ yd}$

$$= \frac{13}{3} \times \frac{17}{3}$$

$$= \frac{221}{9}$$

$$= 24\frac{5}{9} \text{ yd}^2$$

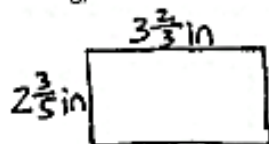
d. $\frac{7}{8} \text{ mi} \times 4\frac{1}{3} \text{ mi}$

$$= \frac{7}{8} \times \frac{13}{3}$$

$$= \frac{91}{24}$$

$$= 3\frac{19}{24} \text{ mi}^2$$

2. Julie is cutting rectangles out of fabric to make a quilt. If the rectangles are $2\frac{3}{5}$ inches wide and $3\frac{2}{3}$ inches long, what is the area of four such rectangles?



Area of 1 rectangle: $3\frac{2}{3} \times 2\frac{3}{5} = \frac{11}{3} \times \frac{13}{5}$

$$= \frac{143}{15}$$

$$= 28\frac{3}{5} \text{ in}^2$$

Area of 4 rectangles:

$$28\frac{3}{5} \times 4 = 112\frac{12}{5} = 114\frac{2}{5} \text{ in}^2$$

The area of 4 rectangles is $114\frac{2}{5} \text{ in}^2$.

COMMON
CORE

Lesson 13:

Date:

Multiply mixed number factors and relate to the distributive property and area model.

12/19/13

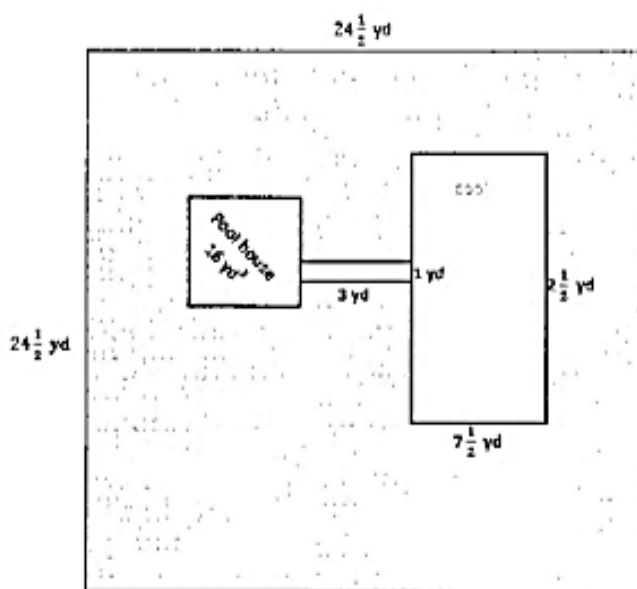
engage^{ny}

5.C.7

3. Mr. Howard's pool is connected to his pool house by a sidewalk as shown. He wants to buy sod for the lawn, shown in grey. How much sod does he need to buy?

Area of the square sod:

$$\begin{aligned} & 24\frac{1}{2} \times 24\frac{1}{2} \\ &= \frac{49}{2} \times \frac{49}{2} \\ &= \frac{2401}{4} \\ &= 600\frac{1}{4} \text{ yd}^2 \end{aligned}$$



$$\text{Area of the pool house} = 16 \text{ yd}^2$$

$$\text{Area of the sidewalk} : 3 \times 1 = 3 \text{ yd}^2$$

$$\begin{aligned} \text{Area of the pool} : 7\frac{1}{2} \times 2\frac{1}{2} &= \frac{15}{2} \times \frac{5}{2} \\ &= \frac{75}{4} \\ &= 18\frac{3}{4} \text{ yd}^2 \end{aligned}$$

Area of square sod — area of pool house — area of sidewalk — area of pool

$$= 600\frac{1}{4} - 16 - 3 - 18\frac{3}{4}$$

$$= 581\frac{1}{4} - 18\frac{3}{4}$$

$$= 580\frac{5}{4} - 18\frac{3}{4} = 562\frac{2}{4} = 562\frac{1}{2} \text{ yd}^2$$

He will need to buy $562\frac{1}{2} \text{ yd}^2$ of sod for the lawn.

Name

Charles

Date

1. George decided to paint a wall with two windows. Both windows are $3\frac{1}{2}$ ft by $4\frac{1}{2}$ ft rectangles. Find the area the paint needs to cover.

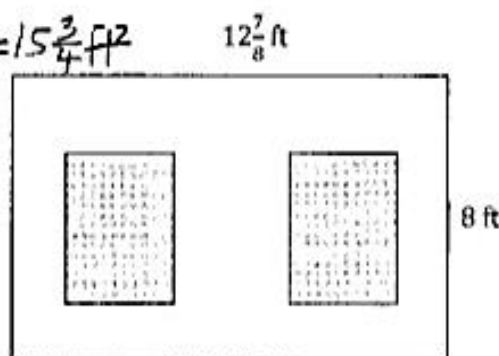
Area of window $3\frac{1}{2} \times 4\frac{1}{2} = \frac{7}{2} \times \frac{9}{2} = \frac{63}{4} = 15\frac{3}{4} \text{ ft}^2$

2 windows: $15\frac{3}{4} \times 2 = 30\frac{6}{4} = 31\frac{1}{2} \text{ ft}^2$

Area of wall: $12\frac{7}{8} \times 8 = 96 + 7 = 103 \text{ ft}^2$

Area to paint: $103 - 31\frac{1}{2} = 71\frac{1}{2} \text{ ft}^2$

The paint needs to cover $71\frac{1}{2} \text{ ft}^2$.

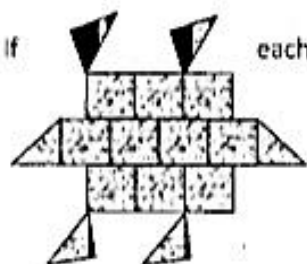


2. Joe uses square tiles, some of which he cuts in half, to make the figure below. If square tile has a side length of $2\frac{1}{2}$ inches, what is total area of the figure?

10 whole tiles + 6 half tiles = 13 tiles

Area of a tile: $2\frac{1}{2} \times 2\frac{1}{2} = \frac{5}{2} \times \frac{5}{2} = \frac{25}{4} = 6\frac{1}{4} \text{ in}^2$

$13 \times 6\frac{1}{4} = 78\frac{13}{4} = 81\frac{1}{4} \text{ in}^2$



The total area is $81\frac{1}{4}$ square inches.

3. All-in-One Carpets is installing carpeting in 3 rooms. How many square feet of carpet is needed to carpet all three?

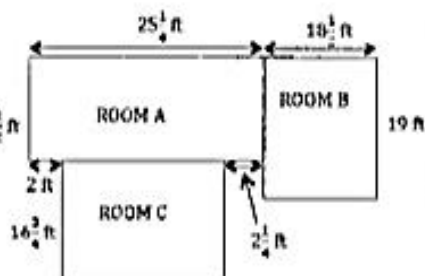
Room A: $25\frac{1}{4} \times 15\frac{1}{2} = \frac{101}{4} \times \frac{31}{2} = \frac{3131}{8} = 391\frac{3}{8} \text{ ft}^2$

Room B: $19 \times 18\frac{1}{2} = 342\frac{19}{2} = 351\frac{1}{2} \text{ ft}^2$

Room C: Length = $25\frac{1}{4} - 4\frac{1}{4} = 21$

$21 \times 16\frac{3}{4} = 336\frac{63}{4} = 351\frac{3}{4} \text{ ft}^2$

$A + B + C = 391\frac{3}{8} + 351\frac{1}{2} + 351\frac{3}{4} = 391\frac{3}{8} + 351\frac{4}{8} + 351\frac{6}{8} = 1093 + \frac{13}{8} = 1094\frac{5}{8} \text{ ft}^2$



The total area to carpet is $1094\frac{5}{8} \text{ ft}^2$.

4. Mr. Johnson needs to buy sod for his front lawn.

- a. If the lawn measures $36\frac{2}{3}$ ft by $45\frac{1}{6}$ ft, how many square feet of sod will he need?

$$36\frac{2}{3} \times 45\frac{1}{6}$$

$$\begin{array}{r} 45 \\ \times 36 \\ \hline 270 \\ 1350 \\ \hline 1620 \end{array}$$

$$36 \times \frac{1}{6} = 6$$

$$45 \times \frac{2}{3} = 30$$

$$\frac{2}{3} \times \frac{1}{6} = \frac{1}{9}$$

$$1620 + 6 + 30 + \frac{1}{9} = 1656\frac{1}{9} \text{ ft}^2$$

He needs $1656\frac{1}{9} \text{ ft}^2$ of sod.

- b. If sod is only sold in whole square feet, how much will Mr. Johnson have to pay?

1657 whole square feet:

$$1000 \times \$0.27 = \$270.00$$

$$500 \times \$0.22 = \$110.00$$

$$157 \times \$0.19 = \$29.83$$

$$\underline{\$409.83}$$

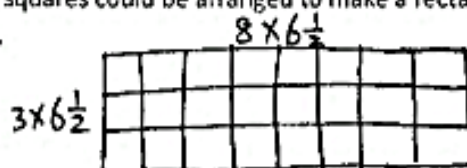
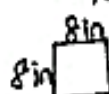
Sod Prices

Area	Price per square foot
First 1,000 sq. ft	\$0.27
Next 500 sq. ft	\$0.22
Additional square feet	\$0.19

He will have to pay \$409.83.

5. Jennifer's class decides to make a quilt. Each of the 24 students will make a quilt square that is 8 inches on each side. When they sew the quilt together, every edge of each quilt square will lose $\frac{3}{4}$ in.

- a. Draw one way the squares could be arranged to make a rectangular quilt. Then find the perimeter of your arrangement.



$$8 \times 6\frac{1}{2} = \frac{8 \times 13}{2} = \frac{104}{2} = 52$$

$$3 \times 6\frac{1}{2} = \frac{3 \times 13}{2} = \frac{39}{2} = 19\frac{1}{2}$$

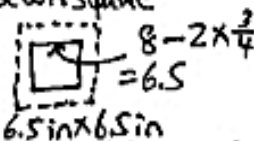
$$P = 52 + 52 + 19\frac{1}{2} + 19\frac{1}{2}$$

$$= 104 + 39$$

$$= 143 \text{ in}$$

The perimeter of my arrangement is 143 in.

Sewn square



- b. Find the area of the quilt.

Each square's area: $8 \text{ in} - 1\frac{1}{2} \text{ in} = 6\frac{1}{2} \text{ in}$

$$\begin{array}{|c|c|c|} \hline 6 & 6\frac{1}{2} & 3 \\ \hline 6 & 36 & 3 \\ \hline \frac{1}{2} & 3 & \frac{1}{4} \\ \hline \end{array} \quad \begin{array}{l} 39 \\ + 3\frac{1}{4} \\ \hline 42\frac{1}{4} \text{ in}^2 \end{array}$$

$$\text{All the squares: } 42\frac{1}{4} \times 24 = \frac{169}{4} \times \frac{24}{1} = 1014 \text{ in}^2$$

The quilt's area is 1014 in^2 .



COMMON
CORE

Lesson 14:

Date:

Day 1 – Solve real world problems involving area of figures with fractional side lengths using visual model and/or equations.

12/19/13

engage^{ny}

5.C.10




Name Ting

Date _____

1. The length of a flowerbed is 4 times as long as its width. If the width is $\frac{3}{8}$ meter, what is the area?

Width $\boxed{\frac{3}{8}}$

Length 

$$\frac{3}{8} \times 4 = \frac{12}{8} = \frac{3}{2} \text{ m}$$

$$\begin{aligned} A &= L \times W \\ &= \frac{3}{2} \times \frac{3}{8} \\ &= \frac{9}{16} \text{ m}^2 \end{aligned}$$

The flowerbed's area is $\frac{9}{16} \text{ m}^2$.

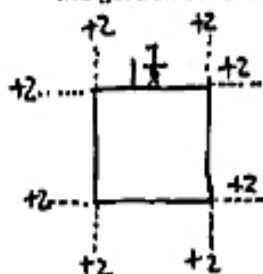
2. Mrs. Johnson's grows herbs in square plots. Her basil plot measures $\frac{5}{8}$ yd on each side.

- a. Find the total area of the basil plot.

$$\frac{5}{8} \text{ yd} \quad \boxed{\frac{25}{64} \text{ yd}^2}$$

The total area of the basil plot is $\frac{25}{64} \text{ yd}^2$.

- b. Mrs. Johnson puts a fence around the basil. If the fence is 2 ft from the edge of the garden on each side, what is the perimeter of the fence?

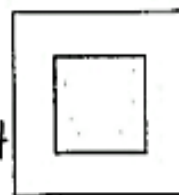


$$\begin{aligned} \frac{5}{8} \text{ yd} &= \frac{5}{8} \times 1 \text{ yd} \\ &= \frac{5}{8} \times 3 \text{ ft} \\ &= \frac{15}{8} \text{ ft} \\ &= 1 \frac{7}{8} \text{ ft} \end{aligned}$$

$$1 \frac{7}{8} \text{ ft} + 4 \text{ ft} = 5 \frac{7}{8} \text{ ft}$$

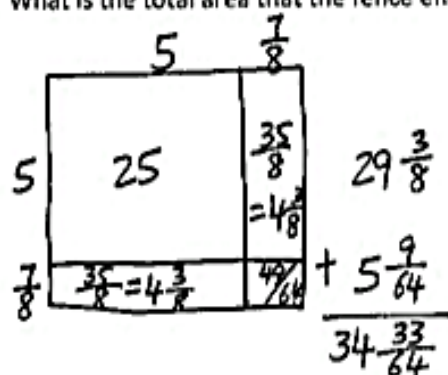
$$\begin{aligned} 5 \frac{7}{8} \text{ ft} \times 4 \\ = 20 \frac{28}{8} \text{ ft} \end{aligned}$$

$$= 23 \frac{1}{2} \text{ ft}$$



The perimeter of the fence is $23 \frac{1}{2} \text{ ft}$.

- c. What is the total area that the fence encloses?



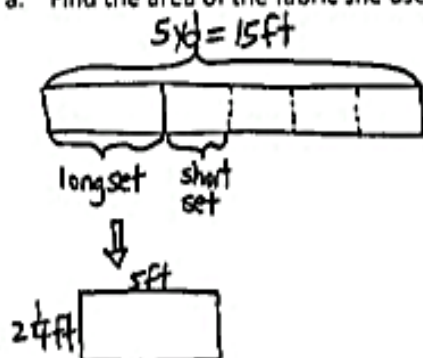
$$\begin{aligned} &4\frac{3}{8} + \frac{49}{64} \\ &= 4\frac{24}{64} + \frac{49}{64} \\ &= 4\frac{73}{64} \\ &= 5\frac{9}{64} \end{aligned}$$

$$\begin{aligned} &29\frac{3}{8} + 5\frac{9}{64} \\ &= 29\frac{24}{64} + 5\frac{9}{64} \\ &= 34\frac{33}{64} \text{ ft}^2 \end{aligned}$$

The fenced area is $34\frac{33}{64} \text{ ft}^2$. That's a little more than $34\frac{1}{2} \text{ ft}^2$.

3. Janet bought 5 yards of fabric $2\frac{1}{4}$ feet wide to make curtains. She used $\frac{1}{3}$ of the fabric to make a long set of curtains and the rest to make 4 short sets.

- a. Find the area of the fabric she used for the long set of curtains.



$$\frac{1}{3} \text{ of } 15 \text{ ft} = 5 \text{ ft}$$

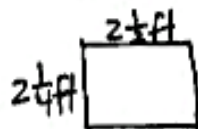
$$\begin{aligned} A &= L \times W \\ &= 5 \text{ ft} \times 2\frac{1}{4} \text{ ft} \\ &= 10\frac{5}{4} \text{ ft}^2 \\ &= 11\frac{1}{4} \text{ ft}^2 \end{aligned}$$

The area of the long set of curtain is $11\frac{1}{4} \text{ ft}^2$.

- b. Find the area of the fabric she used for each of the short sets.

$$15 \text{ ft} - 5 \text{ ft} = 10 \text{ ft}$$

$$\frac{1}{4} \text{ of } 10 \text{ ft} = \frac{10}{4} = 2\frac{2}{4} = 2\frac{1}{2} \text{ ft}$$

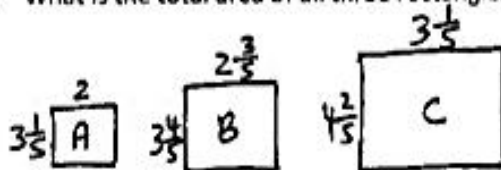


$$\begin{aligned} A &= L \times W \\ &= 2\frac{1}{2} \times 2\frac{1}{4} \\ &= \frac{5}{2} \times \frac{9}{4} \\ &= \frac{45}{8} = 5\frac{5}{8} \text{ ft}^2 \end{aligned}$$

The area of each set of short curtains is $5\frac{5}{8} \text{ ft}^2$.

4. Some wire is used to make 3 rectangles: A, B, and C. Rectangle B's dimensions are $\frac{3}{5}$ cm larger than Rectangle A's dimensions, and Rectangle C's dimensions are $\frac{3}{5}$ cm larger than Rectangle B's dimensions. Rectangle A is 2 cm by $3\frac{1}{5}$ cm.

- a. What is the total area of all three rectangles?

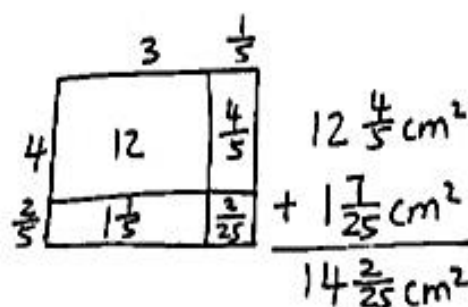
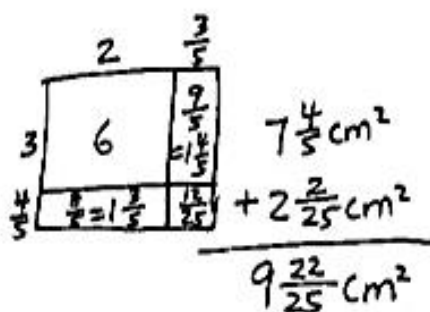
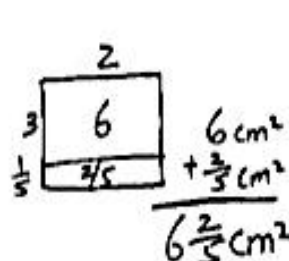


$$\text{Total Area: } 6\frac{2}{5} + 9\frac{22}{25} + 14\frac{2}{25}$$

$$= 6\frac{10}{25} + 9\frac{22}{25} + 14\frac{2}{25}$$

$$= 29\frac{34}{25}$$

$$= 30\frac{9}{25} \text{ cm}^2$$



The total area is $30\frac{9}{25} \text{ cm}^2$.

- b. If a 40 cm coil of wire was used to form the rectangles, how much wire is left?

Perimeter: A: $2 + 2 + 3\frac{1}{5} + 3\frac{1}{5} = 4 + 6\frac{2}{5} = 10\frac{2}{5} \text{ cm}$

B: $2\frac{3}{5} + 2\frac{3}{5} + 3\frac{4}{5} + 3\frac{4}{5} = 4\frac{6}{5} + 6\frac{8}{5} = 10\frac{14}{5} = 12\frac{4}{5} \text{ cm}$

C: $3\frac{1}{5} + 3\frac{1}{5} + 4\frac{2}{5} + 4\frac{2}{5} = 6\frac{2}{5} + 8\frac{4}{5} = 14\frac{6}{5} = 15\frac{1}{5} \text{ cm}$

Total Perimeter: $10\frac{2}{5} + 12\frac{4}{5} + 15\frac{1}{5}$
 $= 37\frac{7}{5}$

$= 38\frac{2}{5} \text{ cm}$

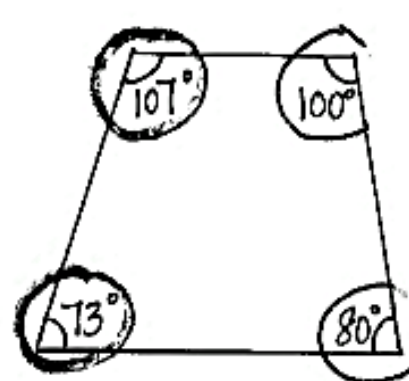
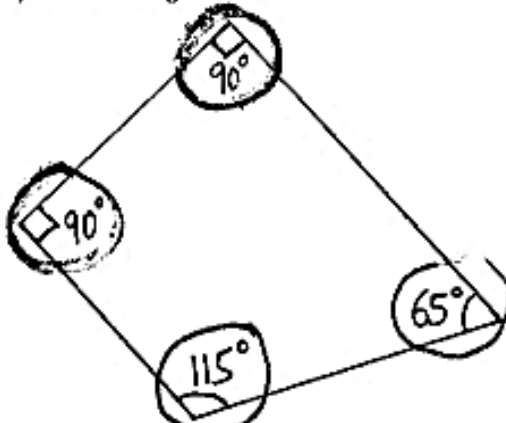
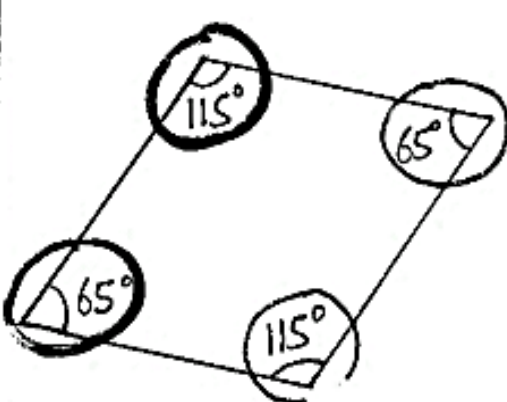
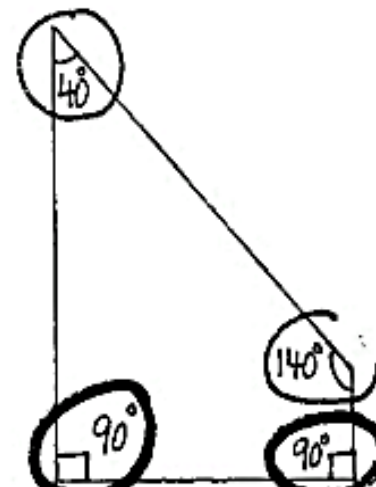
There was $1\frac{3}{5} \text{ cm}$ of wire left.

$40 \text{ cm} - 38\frac{2}{5} \text{ cm} = 1\frac{3}{5} \text{ cm}$

Name Zikera

Date _____

1. Draw a pair of parallel lines in each box. Then use the parallel lines to draw a trapezoid with the following:

<p>No right angles.</p> 	<p>Only 1 obtuse angle.</p> 
<p>2 obtuse angles.</p> 	<p>At least 1 right angle.</p> 

2. Use the trapezoids you drew to complete the tasks below.
- Measure the angles of the trapezoid with your protractor and record the measurements on the figures.
 - Use a marker or crayon to circle pairs of angles inside each trapezoid with a sum equal to 180° . Use a different color for each pair.



COMMON
CORE

Lesson 16:

Date:

Draw trapezoids to clarify attributes and define based on those attributes.

12/19/13

engage^{ny}

5.D.8



3. List the properties that are shared by all the trapezoids that you worked with today.

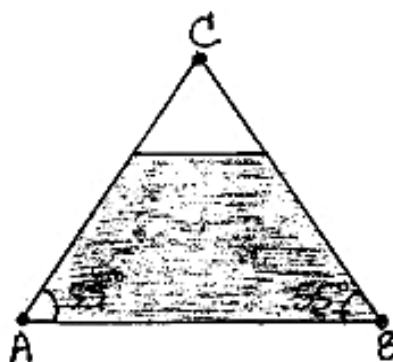
-they have 4 straight sides, but they don't all look the same
-they are quadrilaterals, they have different side lengths & angle measures
-they have at least 1 pair of sides that are parallel

4. When can a quadrilateral also be called a trapezoid?

A quadrilateral that have at least one pair of opposite sides are parallel.

5. Follow the directions to draw one last trapezoid.

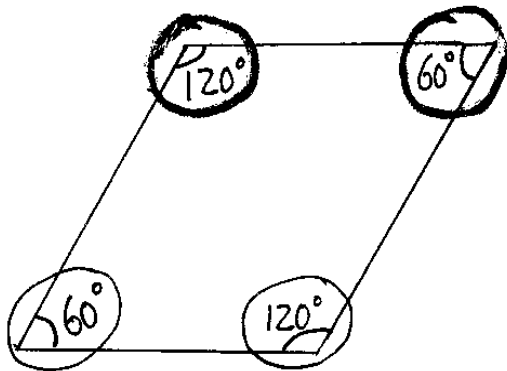
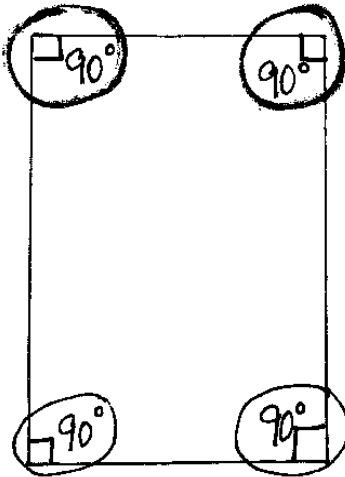
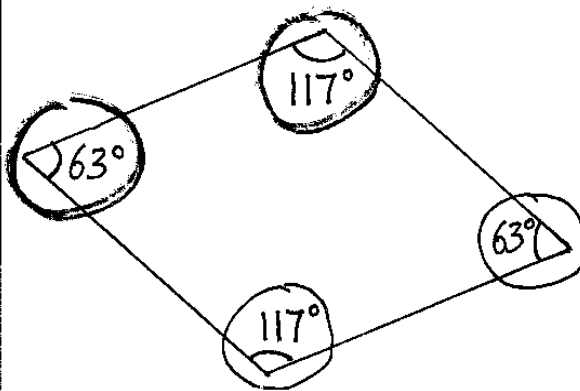
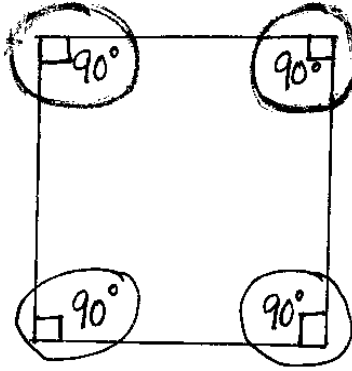
- Draw a segment AB parallel to the bottom of this page that is 5 cm long.
- Draw two 55° angles with vertices at A and B so that an isosceles triangle is formed with AB as the base of the triangle.
- Label the top vertex of your triangle as C .
- Use your set square to draw a line parallel to AB that intersects both AC and BC .
- Shade the trapezoid that you drew.



Name Carter

Date _____

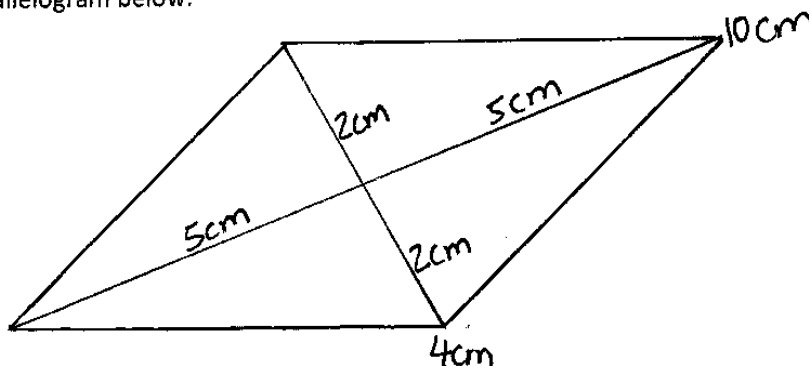
1. Draw a parallelogram in each box with the attributes listed.

<p>No right angles.</p> 	<p>At least 2 right angles.</p> 
<p>Equal sides with no right angles.</p> 	<p>All sides equal with at least 2 right angles.</p> 

*** In each Parallelogram, there are 4 pairs of angles that add up to 180° .



2. Use the parallelograms you drew to complete the tasks below.
 - a. Measure the angles of the parallelogram with your protractor and record the measurements on the figures.
 - b. Use a marker or crayon to circle pairs of angles inside each parallelogram with a sum equal to 180° . Use a different color for each pair.
3. Draw another parallelogram below.



- a. Draw the diagonals and measure their length. Record the measurements to the side of your figure.
- b. Measure the length of each of four segments of the diagonals from the vertices to the point of intersection of the diagonals. Color segments that have the same length the same color. What do you notice?

The diagonals bisect the parallelogram into 2 equal triangles.

4. List the properties that are shared by all of the parallelograms that you worked with today.

- have 4 straight sides
- have 2 pairs of parallel sides
- all sides can be the same length
- Each pair of parallel sides have to be the same length

- a. When can a quadrilateral also be called a parallelogram?

A quadrilateral that have both pairs of opposite sides are parallel.

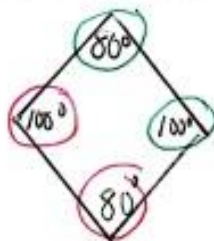
- b. When can a trapezoid also be called a parallelogram?

When a trapezoid has more than 1 pair of parallel sides, it can be called a parallelogram.

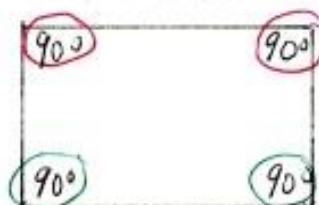
Name Lisa Date _____

1. Draw the figures in each box with the attributes listed.

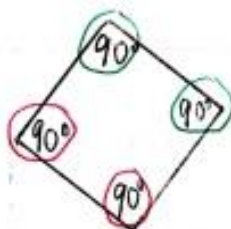
Rhombus with no right angles.



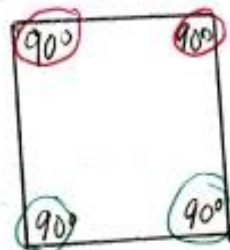
Rectangle with not all sides equal.



Rhombus with 1 right angle.



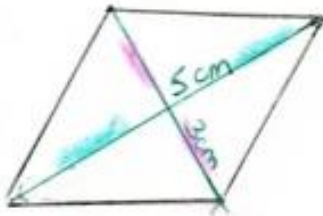
Rectangle with all sides equal.



2. Use the figures you drew to complete the tasks below.

- Measure the angles of the figures with your protractor and record the measurements on the figures.
- Use a marker or crayon to circle pairs of angles inside each figure with a sum equal to 180° . Use a different color for each pair.

3. Draw a rhombus and a rectangle below.



- Draw the diagonals and measure their length. Record the measurements on the figure.
- Measure the length of each segment of the diagonals from the vertex to the intersection point of the diagonals. Using a marker or crayon, color segments that have the same length. Use a different color for each different length.

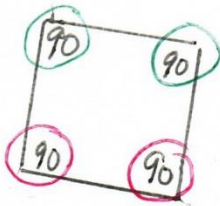
- 4.
- List the properties that are shared by all of the rhombuses that you worked with today.
They all have the same length sides. Their angles add up to 180° between two sides. The pairs of sides are parallel to each other.
 - List the properties that are shared by all of the rectangles that you worked with today.
They all have 90° angles in every angle. Both pairs of sides are parallel and equal.
 - When can a trapezoid also be called a rhombus?
When all 4 sides are equal.
 - When can a parallelogram also be called a rectangle?
When all the angles measure 90° .
 - When can a quadrilateral also be called a rhombus?
When all 4 sides are equal and pairs of sides are parallel to each other.

Name Lisa

Date _____

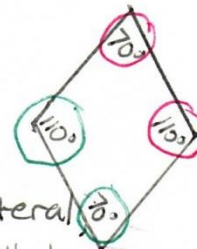
1. Draw the figures in each box with the attributes listed. If your figure has more than one name, write it in the box.

Rhombus with 2 right angles.



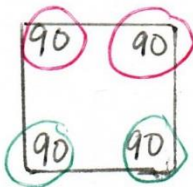
Rhombus, rectangle, square,
parallelogram, trapezoid,
quadrilateral

Kite with all sides equal.

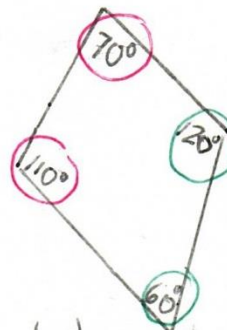


Kite, quadrilateral,
rhombus, parallelogram,
trapezoid

Kite with 4 right angles.



Kite, rectangle, square,
parallelogram, trapezoid,
quadrilateral, rhombus

Kite with 2 pairs of adjacent sides equal
(but the pairs are not equal to each other.)

Kite, quadrilateral

2. Use the figures you drew to complete the tasks below.
- Measure the angles of the figures with your protractor and record the measurements on the figures.
 - Use a marker or crayon to circle pairs of angles inside each figure with a sum equal to 180° . Use a different color for each pair.

3.

- a. List the properties shared by all of the squares that you worked with today.

4 equal sides, all 90° angles, both pairs of sides parallel.

- b. List the properties shared by all of the kites that you worked with today.

4 sides, pairs of angles add up to 180° , 2 sets of adjacent equal sides.

- c. When can a rhombus also be called a square?

When all 4 angles measure 90°

- d. When can a kite also be called a square?

When all 4 sides are equal and at 90° to each other.

- e. When can a trapezoid also be called a kite?

When all 4 sides or all 4 angles are equal, if it's a square or rhombus.

Name Jeremy

Date _____

1. True-False. If the statement is false, rewrite it to make it true.

	T	F
a. All trapezoids are quadrilaterals.	✓	
b. All parallelograms are rhombuses. Some parallelograms are rhombuses.		✓
c. All squares are trapezoids.	✓	
d. All rectangles are squares. All squares are rectangles.		✓
e. Rectangles are always parallelograms.	✓	
f. All parallelograms are trapezoids.	✓	
g. All rhombuses are rectangles. Some rhombuses are rectangles.		✓
h. Kites are never rhombuses. Kites are sometimes rhombuses.		✓
i. All squares are kites.	✓	
j. All kites are squares. Some kites are squares.		✓
k. All rhombuses are squares. All squares are rhombuses.		✓

2. Fill in the blanks.

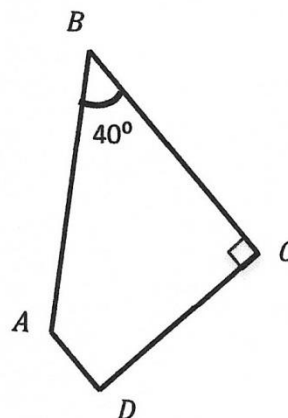
- a. $ABCD$ is a trapezoid. Find the measurements listed below.

$\angle A = 140^\circ$

$\angle D = 90^\circ$

What other names does this figure have?

quadrilateral



- b. $RECT$ is a rectangle. Find the measurements listed below.

$TE = 26$

$RC = 26$

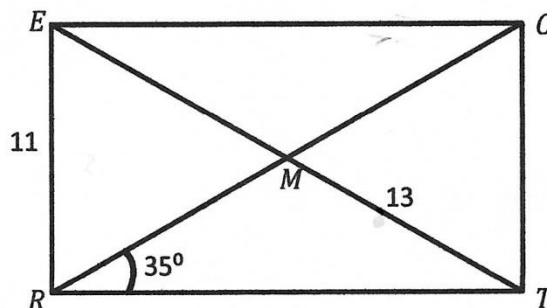
$CT = 11$

$\angle ERM = 55^\circ$

$\angle CTR = 90^\circ$

What other names does this figure have?

quadrilateral, parallelogram, trapezoid



- c. $PARL$ is a parallelogram. Find the measurements listed below.

$AL = 16$

$PR = 18$

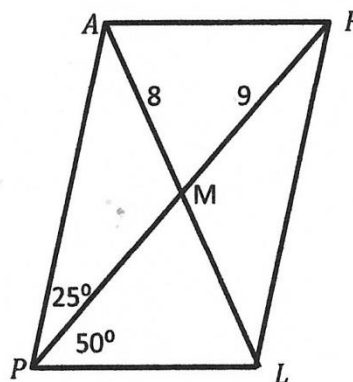
$\angle ARL = 75^\circ$

$\angle PAR = 105^\circ$

$\angle RLP = 105^\circ$

What other names does this figure have?

quadrilateral, trapezoid

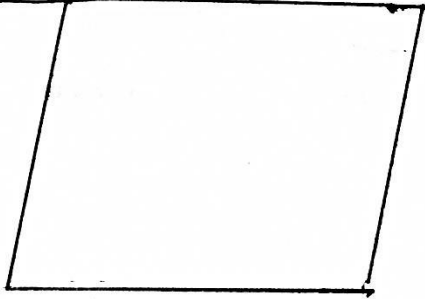


Name Baxter

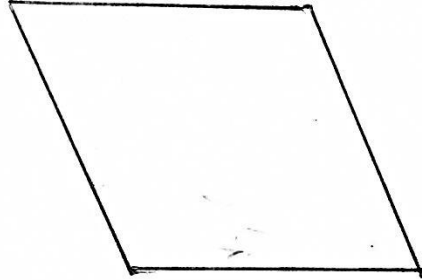
Date _____

1. Write the number on your task card and a summary of the task in the blank. Then draw the figure in the box. Label your figure with as many names as you can. Circle the most specific name.

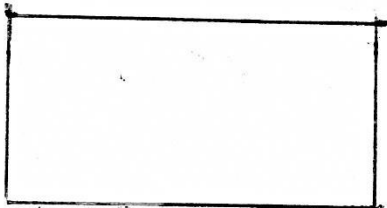
Task #17: parallelogram with 60° angle
quadrilateral, trapezoid,
parallelogram



Task #7: quadrilateral with 4 equal sides
quadrilateral, parallelogram, trapezoid,
kite, rhombus

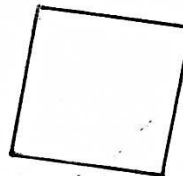


Task #2: rectangle with length twice its width



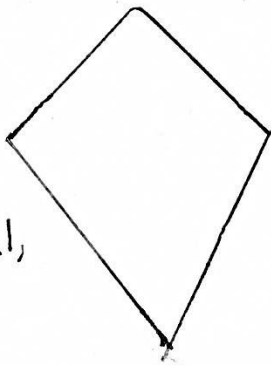
quadrilateral, trapezoid,
parallelogram, rectangle

Task #11: parallelogram with no right angles



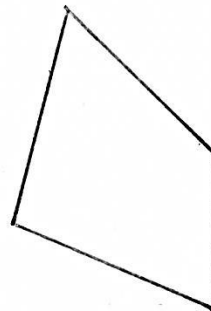
quadrilateral, trapezoid,
parallelogram

Task #21: Kite that's not a parallelogram



quadrilateral,
Kite

Task #24: quadrilateral whose diagonals don't bisect each other



quadrilateral,
trapezoid

2. John says that because rhombuses don't have perpendicular sides, they can't be rectangles. Explain his error in thinking.

Some rhombuses do have perpendicular sides.
These are squares, and squares are rectangles.

3. Jack says that because kites don't have parallel sides, a square isn't a kite. Explain his error in thinking.

A kite just has 2 pairs of equal adjacent sides, so a square is a kind of kite since it has 2 pairs of equal adjacent sides. So a square is a kind of kite.