

Summer Enrichment Packet

Rising Math Grade 7 Students

ANSWER KEY



PRINCE GEORGE'S COUNTY PUBLIC SCHOOLS
Division of Academics
Department of Curriculum and Instruction

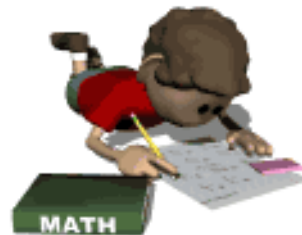


Summer Student Enrichment Packet

Math 7


Note to the Student

You've learned so much in Grade 6! It is important that you keep practicing your mathematical knowledge over the summer to be ready for Math 7 Common Core. In this packet, you will find weekly activities for the summer break.



Directions:

- Create a personal and fun math journal by stapling several pieces of paper together or use a notebook or binder with paper. Be creative and decorate the cover to show math in your world.
- Each journal entry should:
 - ❖ Have the week number and the problem number.
 - ❖ Have a clear and complete answer that explains your thinking.
 - ❖ Be neat and organized.
- *Pay attention to the gray boxes that you see at the beginning of each week's activities. Those boxes indicate the Common Core domain and standard that the*

subsequent activities address. If you see a NON-CALCULATOR SYMBOL  next to a gray box, then do not use a calculator for the activities in that section!

Playing board and card games are a good way to reinforce basic computation skills and mathematical reasoning. Try to play board and card games at least once a week. Some suggested games to play are: Monopoly, Chess, War, Battleship, Mancala, Dominoes, Phase 10, Yahtzee, 24 Challenge, Sudoku, KenKen, Connect Four, and Risk.

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Where to Go to Get Help ... or Practice!

During the course of your math work this summer, you may need some assistance with deepening your understanding the skills and concepts. You also might want to get some more practice. Here are some sites you can visit online:



To get the exact definition of each standard, go to www.corestandards.org and search for the content standard (for example, *7.NS.1a*).



Khan Academy has helpful videos and self-guided practice problems for every grade level. Go to www.khanacademy.org to get started.

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WEEK 1 || Ratios & Proportional Relationships Standards 6.RP.1-6.RP.3:
Understand ratio concepts and use ratio reasoning to solve problems.

Directions:

1. Find five examples of ratios in the real world. Write them down and describe the situation in which they are found. *Remember, ratios are comparisons of two quantities which can be written in the following ways:

1) a to b *Answers will vary. 5 apples to 4 oranges. 10 boys to 7 girls. Etc.*

2) $\frac{a}{b}$

3) a : b



Example: At the grocery store, Brandi noticed that there were three times as many carts as there were baskets for shoppers to use to carry their food.

The ratio of carts to baskets (c : b) is 3 to 1.

2. Create a problem using ratios for your parents/guardians or friends to solve. Write both your problem and solution in your journal.

Answers will vary.

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WEEK 2 || Number System Standards 6.NS.1-6.NS.3: Apply and extend previous understandings of multiplication and division to divide fractions by fractions.



Directions: Complete the problems below.

1. Chef Emerald had a recipe that called for $\frac{3}{4}$ lb onions and $1\frac{1}{3}$ lbs of pork. He was preparing the recipe for a special event and needed to quadruple it to make enough for all of his guests. How many pounds of onions and pounds of pork would he need for the recipe? *Show all work.*



$$\frac{3}{4} \cdot 4 = 3 \text{ pounds of onions needed}$$

$$1\frac{1}{3} = \frac{4}{3} \cdot 4 = \frac{16}{3} = 5\frac{1}{3} \text{ pounds of pork needed}$$

2. Create a problem about the estimated cost of ingredients for the recipe if onions cost \$2.99/lb. and pork costs \$5.49/lb. Include both an estimated solution and an exact solution to see that your estimation is reasonable.

My estimates:

For the onions, 3 pounds \cdot \$3 per pound = \$9 total

For the pork, 5 pounds \cdot \$5.5 per pound = \$27.50 total

Exact solutions:

For the onions, 3 pounds \cdot \$2.99 per pound = \$8.97 total

For the pork, 5 pounds \cdot \$5.49 per pound = \$27.45 total

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WEEK 3 || Expressions & Equations Standard 6.EE.6: Use variables to represent numbers and write expressions when solving a real-world or mathematical problem.

Directions: Complete both problems below.

1. A town's total allocation for police officer's wages and benefits in a new budget is \$800,000. If wages are calculated at \$55,000 per officer and benefits at \$25,000 per officer, write an equation where the solution is the number of officers the town can employ if they spend their whole budget. Solve the equation.



$$55,000p + 25,000p = 800,000$$

$$80,000p = 800,000$$

$$p = 10$$

2. Deon was offered a job at the nearby recreation center. The owner offered him \$600 per week or \$50 the first day and agreed to double it for each following day.

- How could Deon make the most money?
- Which deal should he accept and why?

3. Create three real-world mathematical problems involving variables to represent unknown numbers. **Be sure to create an answer key with explanations of how to solve each of your problems.*

Answers will vary

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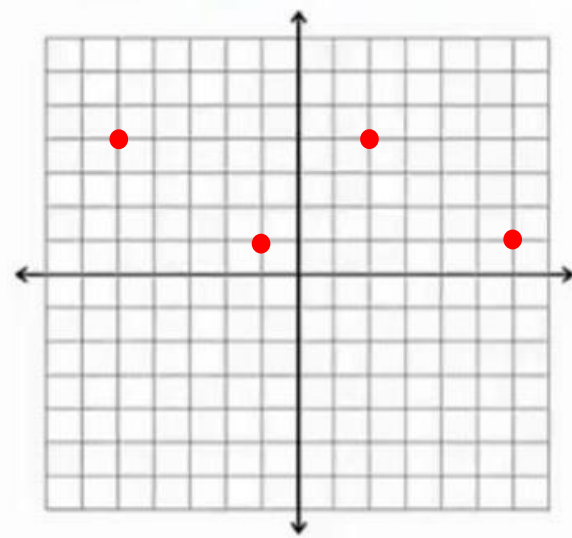
WEEK 4 || Geometry Standard 6.G.3: Draw polygons in the coordinate plane given coordinates for the vertices.

Directions: Complete Parts 1 and 2.

Part 1

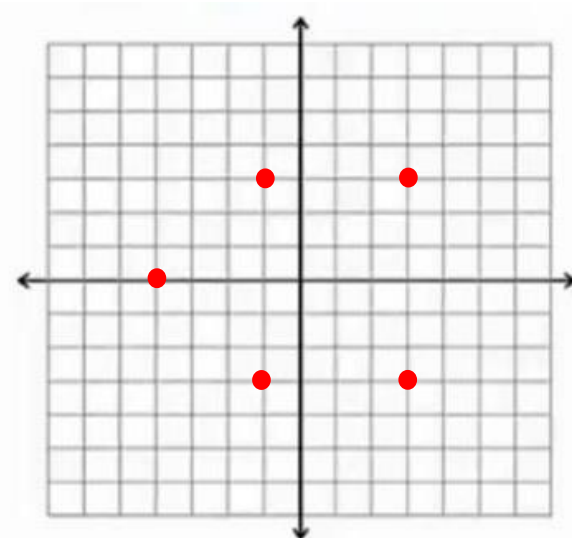
1. Use the following coordinates to draw polygons on the coordinate plane below.

- A. (6, 1)
- B. (2, 4)
- C. (-5, 4)
- D. (-1, 1)



Name the figure: parallelogram

- A. (3, 3)
- B. (-1, 3)
- C. (-4, 0)
- D. (-1, -3)
- E. (3, -3)



Name the figure: pentagon

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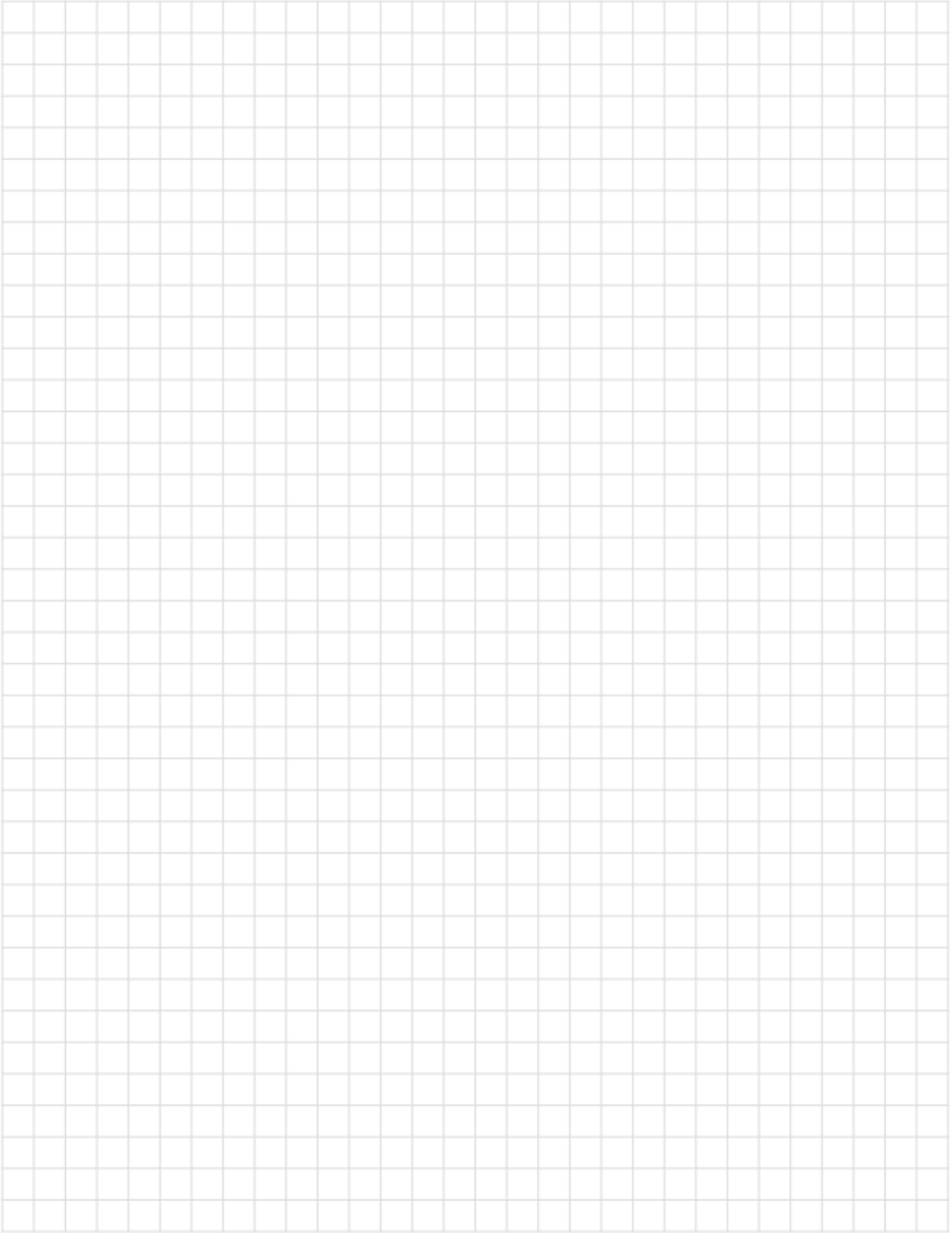
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Part 2

2. On graph paper (on the next page), draw your own coordinate plane. Label the X and Y axes.
3. Choose a room in your house and study the arrangement of the furniture.
4. Measure the dimensions of at least four pieces of furniture in the room you chose.
5. Create a scale, and then graph the pieces of furniture on your coordinate plane.
6. Write directions using your coordinate plane and furniture model to give to a parent to see if they can complete a transformation of the furniture according to the directions and scale model you created.

Answers will vary.

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WEEK 5 || Number System Standard 6.NS.4: Find the greatest common factor of two whole numbers less than or equal to 100 and the least common multiple of two whole numbers less than or equal to 12. Use the distributive property to express a sum of two whole numbers 1-100 with a common factor as a multiple of a sum of two whole numbers with no common factor.

Directions: Solve the following problems.



1. The florist can order roses in bunches of one dozen and lilies in bunches of 8. Last month she ordered the same number of roses as lilies. If she ordered no more than 100 roses, how many bunches of each could she have ordered?

She could have ordered the following:

2 rose bunches, 3 lily bunches

4 rose, 6 lily

6 rose, 9 lily

8 rose, 12 lily

2. What is the smallest number of bunches of each could she have ordered? Explain your answer.

She could have ordered 2 rose bunches and 3 lily bunches because $2 \times 12 = 24$ and $3 \times 8 = 24$. That is the least numbers of bunches of each flower that would result in the same number overall.

3. In your journal, create a table or draw a diagram to solve the problem. Explain your reasoning.

Bunches	1	2	3	4	5	6
Roses	12	24	36	48	60	72
Lilies	8	16	24	32	40	48

My table shows the possible numbers of roses and lilies for each number of bunches. It shows that 2 bunches of roses and 3 of lilies would equal 24 of each flower.

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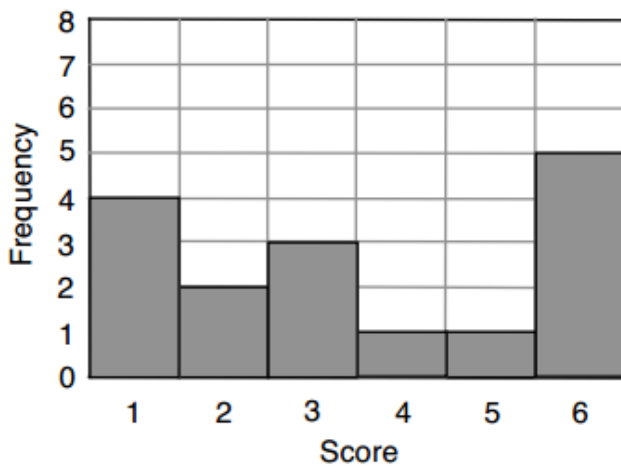
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WEEK 6 || Statistics & Probability Standard 6.SP.2: Understand that a set of data collected to answer a statistical question has a distribution that can be described by its center, spread, and overall shape.

Directions: Solve the problems below.

1. The bar chart represents the scores from a quiz. Children were asked to name six boy bands in 30 seconds. Each score represents the number of correctly named bands.

Boy Bands



a. How many children were involved in the quiz? Show your work.

$$4 + 2 + 3 + 1 + 1 + 5 = 16 \text{ children were involved in the quiz}$$

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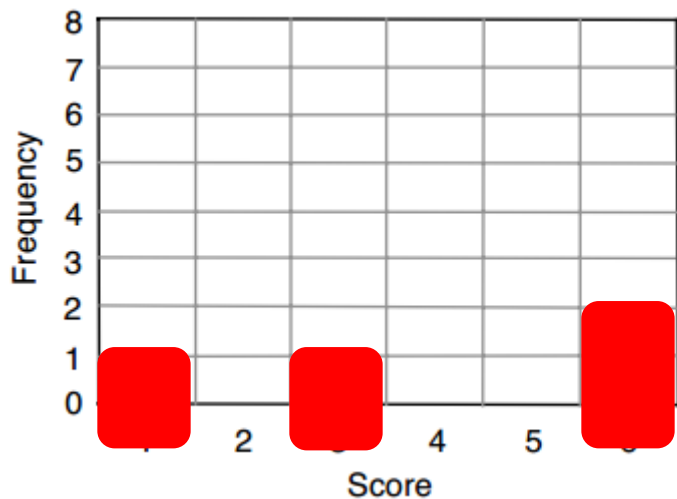
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b. Complete the table with values for the Mean, Median, Mode, and Range of scores. Explain how you calculate each answer.

Mean Score	<u>3.5</u>	I took the number of students for each score and multiplied and added to get 56. $56/16 = 3.5$
Median Score	<u>3</u>	The scores in order are 1, 1, 1, 1, 2, 2, 3, 3, 3, 4, 5, 6, 6, 6, 6, 6. The middle score is 3.
Mode Score	<u>6</u>	The score of 6 occurs the most times among the quiz scores (5 times).
Range of Scores	<u>5</u>	The greatest score, 6, minus the least score, 1, equals 5.

2. The results of another quiz question are shown in the table below. Draw a possible bar chart of the scores.

Mean score	3.5
Median score	3
Mode score	6
Range of scores	5



Answers may vary. Sample answer given.

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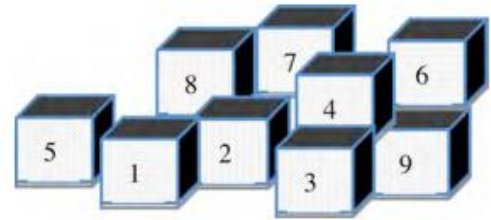
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WEEK 7 || Expressions & Equations Standards 6.EE.4-6.EE.5: Apply and extend previous understandings of arithmetic to algebraic expressions. Reason about and solve one-variable equations and inequalities.

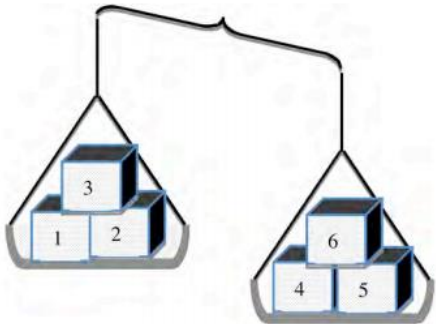
There are nine small boxes in a room. They all look exactly the same, but one is a bit heavier than the others.

William says:

I can use the scales to find the heavy one in just two steps!



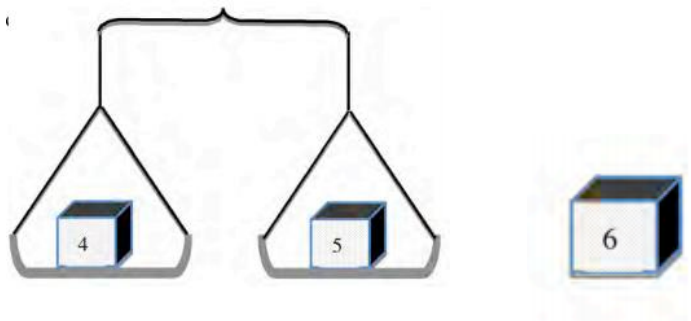
First, William arranges the boxes like this:



1. Explain what William now knows about the heavy box.

William knows that the heavy box is either 4, 5, or 6, because that side of the scale is lower, meaning it is heavier than the other side.

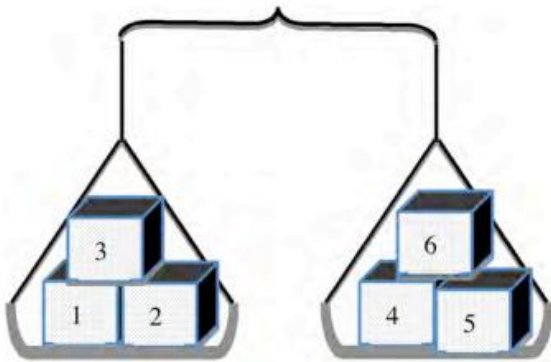
Then, William separates the boxes like this.



2. Which is the heavy box? Explain how you know.

The heavy box is 6. From the first picture, I know that the heavy box is 4, 5, or 6. From this picture, if 4 and 5 are equal in weight, then 6 must be the heavy box.

3. Suppose the scales showed this the first time instead.



What should William do now to find the heavy box?

Since the two sides right now are equal, I would take off 4, 5, and 6 and put on 7, 8, and 9. One box among 7, 8, and 9 must be the heavy one. From there, I would place 7, 8, and 9 by themselves on either side of the scale to determine which one was the heavy one.

WEEK 8 || MATH 7 UNIT 1 PREVIEW – Ratios & Proportional Reasoning
Standard 7.RP.1: Understand ratio concepts and use ratio reasoning to solve problems. **Number System Standard 7.NS.3:** Solve real world problems involving the four operations with rational numbers.



Directions: Complete each task below.

Task 1:

Here is a recipe for making 8 doughnuts:

4 cups of flour
$\frac{1}{2}$ cup of milk
$\frac{3}{4}$ cup of sugar
2 eggs
2 sticks of butter
One tablespoon of yeast



You want to make 28 doughnuts.

a. How much flour do you need? Show your work.

For 8 doughnuts, 4 cups of flour are needed. That is 2 doughnuts for every 1 cup of flour. To get 28 doughnuts, I would multiply 2×14 , so $14 \times 1 = 14$ cups of flour.

b. How much milk do you need? Show your work.

For 8 doughnuts, $\frac{1}{2}$ cup of milk is needed. That is $\frac{1}{16}$ cup of milk for every doughnut. To get 28 doughnuts, I would multiply $28 \times \frac{1}{16}$ to get $\frac{28}{16}$ or 1 and $\frac{3}{4}$ cups of milk.

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Task 2:

Calculate the prices of the paint cans.

The prices are proportional to the amount of paint in the can.



0.25L for \$3

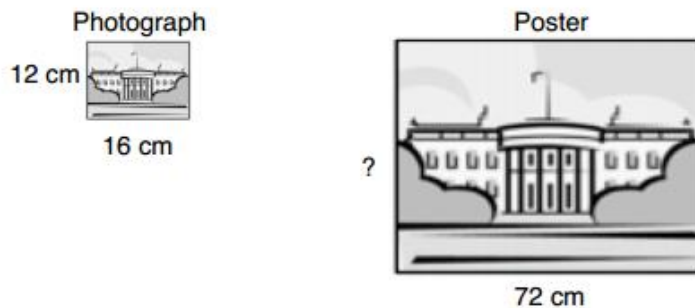
0.7L for \$8.40

2.5L for \$30

3.52L for \$42.24

For \$57.60, it's 4.8L

Task 3:



a. The poster is 72cm wide. How high is the poster?

$$72/16 = 4.5; 4.5 \times 12 = 54$$

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b. The building on the poster is 36cm tall. Is it possible to figure out how tall the building is on the photograph? If you think it is possible, show how. If you think it is not, explain why.

If the building on the poster is 36cm tall, then it is half of the total width of the poster. If that is the case, then the building in the photograph is 8cm because the width of the photograph is 16cm.

Task 4:

A local food company produces yogurt in $\frac{3}{4}$ cup tubs.

$$2 \text{ cups} = 1 \text{ pint}$$

$$2 \text{ pints} = 1 \text{ quart}$$

$$4 \text{ quarts} = 1 \text{ gallon}$$

$$16 \text{ fl. oz.} = 1 \text{ pint}$$



Show all your work as you answer the questions below:

1. The tubs of yogurt are sold for \$0.75 each. Twenty percent of this is profit for the food company. How much profit does the company make on each tub?

$$0.75 \times 0.2 = 0.15$$

The company makes 15 cents profit on each tub.

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2. The machine that fills the $\frac{3}{4}$ cup tubs with yogurt runs 10 hours a day for 5 days a week. It fills 1600 tubs an hour. How many gallons of yogurt are needed to fill 1600 tubs?

$$1600 \text{ tubs} \times \frac{3}{4} \text{ cup in a tub} = 1200 \text{ cups}$$

$$1200 \text{ cups} / 2 = 600 \text{ pints}$$

$$600 \text{ pints} / 2 = 300 \text{ quarts}$$

$$300 \text{ quarts} / 4 = 75 \text{ gallons}$$

75 gallons of yogurt are needed to fill the 1600 tubs.

3. How many gallons of yogurt are produced each week?

75 gallons used per hour

$$75 \times 10 \text{ hours a day} = 750 \text{ gallons per day}$$

$$750 \text{ gallons per day} \times 5 \text{ days} = 3,750 \text{ gallons of yogurt produced each week}$$

4. Each tub of yogurt contains 1.85g of fat. The company would like to reduce this amount by 15%, but instead of changing the yogurt composition, the company would like to alter the serving size. How many fluid ounces will the new container be?

If the company wants to reduce the fat content by 15%, it should reduce the size of the container by 15%.

$$1 \text{ cup} = 8 \text{ fl. oz.}$$

$$\frac{3}{4} \text{ cup} \times 8 = 6 \text{ fl oz.}$$

$$6 \times 0.15 = 0.9$$

$$6 - 0.9 = 5.1 \text{ ounces}$$

The new container should be 5.1 fluid ounces.