RISING AIM

Summer 2022

Greetings Rising 6th Grader and Welcome to Applied Investigations in Mathematics (AIM)!

The purpose of this summer school packet of mathematics problems is to provide you the opportunity to review material that you may have learned last year, to give you a great start to the upcoming 2022 - 2023 school year.

We want to encourage you to at least try some of the problems. And, you can work on this packet in one sitting, or do some problems one day, and come back to other problems on other days; it is completely up to you! Instead, Try to do one or two problems a day.

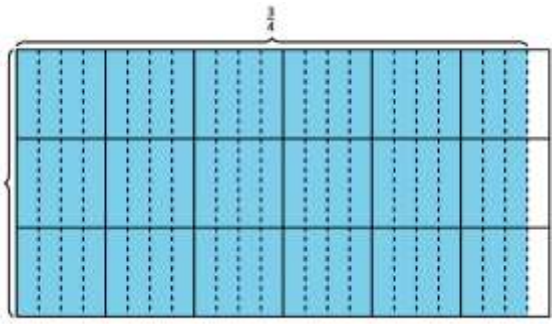
We hope that you have a wonderful summer and are looking forward to the upcoming school year.

Sincerely,

Montgomery County Public Schools Secondary Mathematics Team

Rising AIM Summer Review Packet

1. Select **all** of the expressions that represent the shaded area below in square feet.



   A. $3 + 5\frac{3}{4}$

   B. $3 \times 5\frac{3}{4}$

   C. $3 \times \left(5 + \frac{3}{4}\right)$

   D. $(3 \times 5) + \frac{3}{4}$

   E. $3 \times 6 - \left(3 \times \frac{1}{4}\right)$

2. Evaluate each expression. Explain or show your reasoning.

   a) $3\frac{2}{5} \times 10$

   b) $8 \times \frac{14}{3}$

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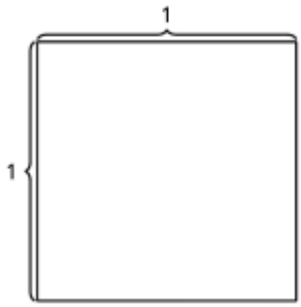
3. a) Shade $\frac{1}{2}$ of $\frac{1}{5}$ of the square.

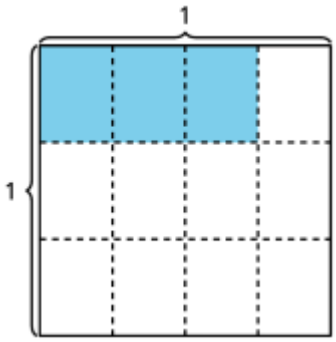


b) Explain where you see $\frac{1}{2}$ of $\frac{1}{5}$ in your drawing.

_____

_____

4. a) Write an expression for the shaded region of the square.



b) Explain how your expression matches the shaded region.

_____

_____

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5. Find the value that makes each equation true.

a) $\frac{7}{10} \times \frac{3}{5} = \_\_\_\_\_$

b) $\frac{2}{5} \times \_\_\_\_\_ = \frac{8}{45}$

c) $\_\_\_\_\_ \times \frac{4}{9} = \frac{28}{45}$

6. This flag of Sweden is $3\frac{1}{5}$ inches wide and 2 inches tall. The rectangle in the upper right is $\frac{9}{5}$ inches wide and $\frac{4}{5}$ inch tall.

a) What is the area of the entire flag?

b) What is the area of the rectangle in the upper right?

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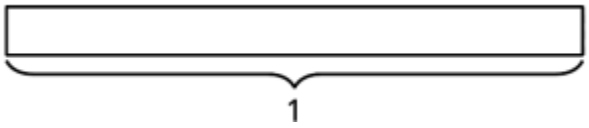
7. a. Use the diagram to represent the expression $\frac{1}{5} \div 2$.



b. Explain how the diagram shows $\frac{1}{5} \div 2$.

_____

_____

c. What is the value of $\frac{1}{5} \div 2$

8. Mai has a strip of paper that is 3 feet long. She cuts it into $\frac{1}{4}$ foot strips.

a) How many $\frac{1}{4}$ foot strips does Mai make? Explain or show your reasoning.

b) Write a division equation to represent your answer.

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9. Find the value of each expression.

a) $5 \div \frac{1}{4}$

b) $6 \div \frac{1}{4}$

c) $3 \div \frac{1}{6}$

d) $3 \div \frac{1}{7}$

10. Solve each problem. Write an equation showing your answer.

a) The container holds $\frac{1}{2}$ gallon of water. It is $\frac{3}{4}$ full. How many gallons of water are in the container?

b) The container has $\frac{1}{2}$ gallon of water. 6 friends split the water equally. How many gallons of water does each friend get?

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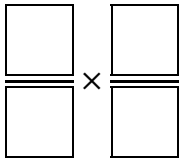
c) The container has 1 gallon of water. Each bottle holds $\frac{1}{8}$ of a gallon. How many bottles of water does the container hold?

11. Using the numbers 4, 5, 6, 7, 8, or 9, what is the largest product you can make?



You can use each number at most once. Explain or show your reasoning.

12. Clare has 5 yards of ribbon. It takes $\frac{1}{2}$ yard to make a bow. How many bows can Clare make with the ribbon? Write a multiplication and a division equation showing the solution.

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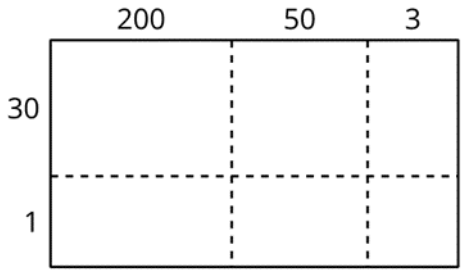
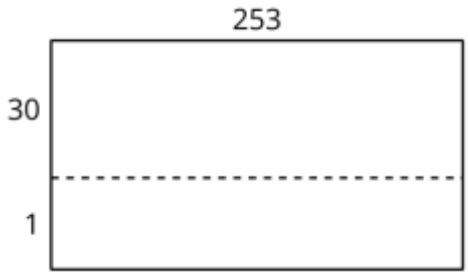
13. Complete the diagrams and use each of them to find 253×31.

a)



b)



How are the strategies the same? How are they different?

14. Find the value of 322×41 using the standard algorithm.

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15. a. 480 dancers make groups of 15. How many groups are there? Explain or show your reasoning.

b. 480 dancers make groups of 30. How many groups are there? Explain or show your reasoning.

16. Use partial quotients to find the value of $243 \div 9$.

$$9\overline{)243}$$

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17. Find $4,250 \div 34$ using partial quotients. Explain your calculations.

18. In a fruit basket there are 9 bananas, 4 apples, and 3 plums.

a) The ratio of bananas to apples is _____ : _____.
b) The ratio of plums to apples is _____ to _____.
c) For every _____ apples, there are _____ plums.
d) For every 3 bananas there is one _____.

19. To make a snack mix, combine 2 cups of raisins with 4 cups of pretzels and 6 cups of almonds.

a) Create a diagram to represent the quantities of each ingredient in this recipe.

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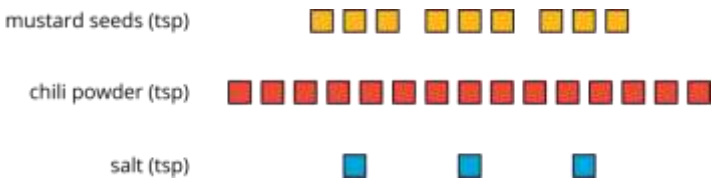
b) Use your diagram to complete each sentence.

- The ratio of _____ to _____ to _____ is _____ : _____ : _____.
- There are _____ cups of pretzels for every cup of raisins.
- There are _____ cups of almonds for every cup of raisins.

20. A recipe for 1 batch of spice mix says, “Combine 3 teaspoons of mustard seeds, 5 teaspoons of chili powder, and 1 teaspoon of salt.” How many batches are represented by the diagram? Explain or show your reasoning.



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21. In a recipe for fizzy grape juice, the ratio of cups of sparkling water to cups of grape juice concentrate is 3 to 1.

a. Find two more ratios of cups of sparkling water to cups of juice concentrate that would make a mixture that tastes the same as this recipe.

b. Describe another mixture of sparkling water and grape juice that would taste different than this recipe.

22. Each of these is a pair of equivalent ratios. For each pair, explain why they are equivalent ratios or draw a diagram that shows why they are equivalent ratios.

a. 4: 5 and 8: 10

b. 18: 3 and 6: 1

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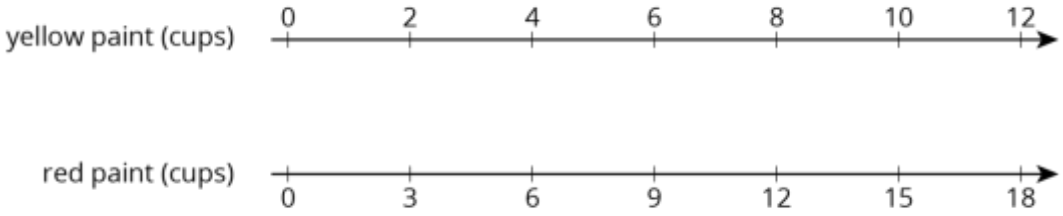
23. A particular shade of orange paint has 2 cups of yellow paint for every 3 cups of red paint. On the double number line, circle the numbers of cups of yellow and red paint needed for 3 batches of orange paint.



24. A recipe for tropical fruit punch says, "Combine 4 cups of pineapple juice with 5 cups of orange juice."

a) Create a double number showing the amount of each type of juice in 1, 2, 3, 4, and 5 batches of the recipe.

b) If 12 cups of pineapple juice are used with 20 cups of orange juice, will the recipe taste the same? Explain your reasoning.

c) The recipe also calls for $\frac{1}{3}$ cup of lime juice for every 5 cups of orange juice. Add a line to your diagram to represent the amount of lime juice in different batches of tropical fruit punch.

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25. Han ran 10 meters in 2.7 seconds. Priya ran 10 meters in 2.4 seconds.

a) Who ran faster? Explain how you know.

b) At this rate, how long would it take each person to run 50 meters? Explain or show your reasoning.

26. A slug travels 3 centimeters in 3 seconds. A snail travels 6 centimeters in 6 seconds. Both travel at constant speeds. Mai says, “The snail was traveling faster because it went a greater distance.” Do you agree with Mai? Explain or show your reasoning.

27. If you blend 2 scoops of chocolate ice cream with 1 cup of milk, you get a milkshake with a stronger chocolate flavor than if you blended 3 scoops of chocolate ice cream with 2 cups of milk. Explain or show why.

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