

Math in the Summertime

Students Entering Grade 8 in September

Name _____

6th Grade Teacher _____

7th Grade Teacher _____

Common Core State Standards

7. EE.1 Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients.

7. EE.2- Understand that rewriting an expression in different forms in a problem context can shed light on the problem and how the quantities in it are related.

Problem #1- Paying Bills and Counting Profits

You and your friends have decided to make money during the summer by putting together a bike tour. You want to make sure that the bike tour will make a profit if you charge \$350. You checked prices and calculated the expenses per person. (Revenue(r) = amount of money you receive; expenses (e) = costs paid out; profit (P) = revenue - expenses)

You start by making the table below:

Tour Revenue and Expenses

Number of Customers	Revenue	Bike Rental	Food and Camp Costs	Total Expenses	Profit
1	\$350	\$30	\$125		
2	\$700	\$60	\$250		
3	\$1050	\$90	\$375		

A. Extend and complete your table for 1 to 6 customers.

B. Write a rule in words and an equation for calculating the

1. revenue r for n customers
2. total expenses e for n customers
3. profit p for n customers

C. Use the equations you wrote in Question B to find the revenue, expenses, and profit for 20 customers and for 31 customers.

D. You forgot that the tour operators need to rent a van to carry equipment. The rental cost for the van will be \$700.

1. How does this expense affect the equation for total expenses?
2. How does this expense affect the equation for profit?

E. You are taking a small business loan to cover the cost. You will take a loan of \$3000 at 12% for 3 months.

- a. How much interest will you have to pay?
- b. What is the total amount you will need to repay?

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7.G.1 Solve problems involving scale drawings of geometric figures, such as computing actual lengths and areas from a scale drawing and reproducing a scale drawing at a different scale.

7.G.4 Know the formulas for the area and circumference of a circle and solve problems; give an informal derivation of the relationship between the circumference and area of a circle.

7.G.6 Solve real-world and mathematical problems involving area, volume, and surface area of two and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms.

Problem #2- Rectangular prism



A rectangular prism, with no top, has a length of 30", a width of 6" and a height of 5".

1. If the prism is placed lengthwise on a table, how much of the table's surface is covered by the prism?
2. To paint the outside of the prism (including the base) how many square inches will you have to cover?
3. What is the volume of the prism?
4. If the dimensions of the prism are all doubled, what is the new surface area? (Remember, there is no top).
5. If the dimensions of the prism are all doubled, what is the new volume?

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7. **SP.8** Find probabilities of compound events using organized lists, tables, tree diagrams, and simulation.
- Understand that, just as with simple events, the probability of a compound event is the fraction of outcomes in the sample space for which the compound event occurs.
 - Represent sample spaces for compound events using methods such as organized lists, tables, and tree diagrams. For an event described in everyday language (e.g., “rolling double sixes”), identify the outcomes in the sample space which compose the event.
 - Design and use a simulation to generate frequencies for compound events.

Problem #3-

A game show contestant has a chance to win a new car. The game the contestant is playing is called “Up or down.” The first number in the price of the new car is given. The contestant must correctly choose the remaining four numbers in the price. For each of these four numbers, the correct number in the price is one above or below the number shown. For example, the second number in the price of the car is either 6 or 8.

UP  or DOWN 

1	7	4	8	1
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- The contestant guesses the four remaining numbers in the price of the car. Make a tree diagram that shows the number of possible outcomes.
- Use your results in Exercise 1 to find the probability that the contestant correctly guesses the price of the new car.
- Show another method you can use to find the probability that the contestant correctly guesses the price of the new car.
- The game show host checks the contestant’s guess. The host tells the contestant that 3 of the 4 remaining numbers are the correct numbers in the price of the car. The contestant now has the chance to change one of the numbers to win the car. The contestant guesses which number to change. What is the probability the contestant has won the new car?

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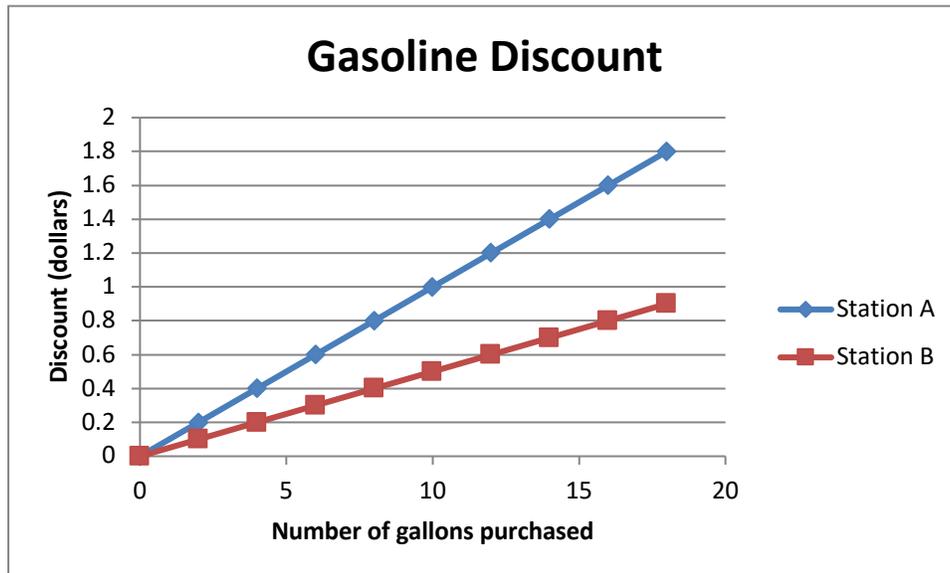
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Common Core State Standards

7. **RP.3** Use proportional relationships to solve multi-step ratio and percent problems. *Examples: simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease, percent error.*

Problem #4- Gas Station Math

The discount on gasoline when using a prepaid gas card at two different gas stations is proportional to the number of gallons purchased, as shown in the graph.



1. Which gas station gives a greater discount per gallon of gasoline? Justify your answer.
2. You use a gas card to purchase 12 gallons of gasoline at Station B. How much would you have saved by using a gas card to purchase 12 gallons at Station A?
3. Gas costs \$3.70 per gallon at both gas stations. The federal government receives \$0.184 in taxes for each gallon of gasoline sold. You use your gas card to purchase \$45 of gas at Station A. How much did the federal government receive in taxes for your purchase?
4. In Exercise 3, you used a \$100 gas card that you purchased with a credit card. The credit card gave you a 5% rebate on the purchase. Including this rebate, what did you actually pay for each gallon of gasoline in Exercise 3?

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Problem #5- Pizza Dilemma



You and some hungry friends go to a pizza shop that makes “perfectly round” pizzas. The round pizzas come in only three sizes, twelve, fourteen and sixteen inch diameter. The twelve inch pizza costs \$12.00, the fourteen inch costs \$14.00 and the sixteen inch costs \$19.00.

1. What is the surface area of each pizza?
2. Which pizza is the best value?
3. The sixteen inch pizza is larger than the twelve inch pizza by what percent?