

lesson fifty eight - student resource sheet

Lesson Objective: Add and subtract rational expressions.

Vocabulary Box

rational expression – An expression that can be written as the ratio of two polynomials.

Example: $\frac{3x^2 - 21x}{x^2 - 14x + 49}$.



Independent Practice

Please complete the following practice problems on your own. Your teacher will review the answers. Make sure that you show all of your work.

Directions: Simplify each expression.

1. $\frac{5u}{7} + \frac{16u}{7}$

2. $\frac{6}{5p} - \frac{3}{10p}$

3. $\frac{8}{6a^6} + \frac{5}{8a^8}$

4. $\frac{2d-5}{3d} - \frac{-4d+7}{5d}$

$$5. \frac{5f}{6f+18} + \frac{4}{5f+15}$$

$$6. \frac{1}{g^2-8g+16} + \frac{2}{g^2-16}$$

BONUS?

Directions: Simplify each expression.

$$1. \frac{h+5}{3h} - \frac{4}{h^2-4} - \frac{5h}{6h+12}$$

$$2. \left(\frac{a}{b} + \frac{c}{d} \right) \div \left(\frac{a}{d} + \frac{b}{c} \right)$$

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Problem **Solving**

Directions: In each equation below, R stands for the missing rational expression that makes the equation true. Find R. Show your work. Check your answers.

1. $\frac{7}{3w} + R = \frac{5}{6w}$

2. $\frac{-3x}{x+2} - R = \frac{x+4}{2x+4}$

3. $\frac{6}{7y^5} + R = \frac{y^2+4}{14y^4}$

4. $5R - \frac{4}{z+4} = 3R + \frac{2}{z-3}$



Directions: Simplify each expression.

1. $\frac{9}{8a} - \frac{5}{2a}$

2. $\frac{2b+6}{5b} - \frac{b-9}{4}$

3. $\frac{c}{4c-20} + \frac{3}{c^2-25}$

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Lesson Objective: Choose and use an appropriate problem-solving strategy.



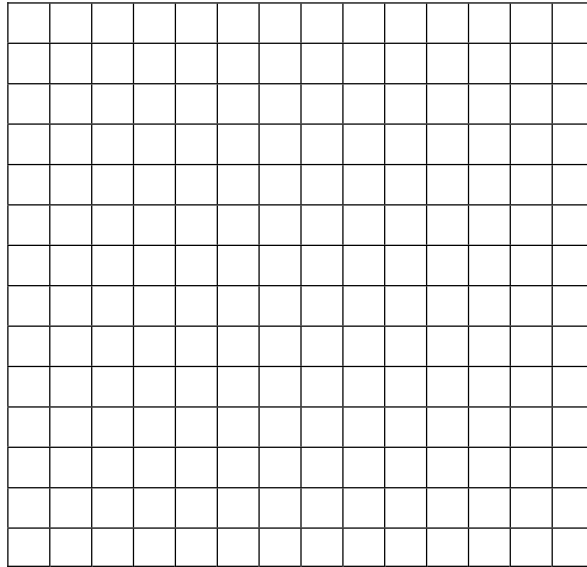
Guided Practice on Problem Solving Strategies

Zoomers are the hottest shoe to hit the market in years. Two stores, Shoe Zoo and Planet Ped, are having a sales competition. The total sales of Zoomers (number of pairs) are shown in the table below.

	Shoe Zoo	Planet Ped
January	0	12
February	10	18
March	21	23
April	30	29
May	42	36
June	52	43

1. What was the total number of pairs of Zoomers sold at Shoe Zoo during the 6-month period?
2. What was the total number of pairs of Zoomers sold at Planet Ped during the 6-month period?
3. Which store won the competition?

- On the same graph, create a scatter plot for each set of data. Use the x-axis to represent the month and the y-axis to represent the number of pairs sold.



- Draw the line of best fit for each data set.
- Determine the equation for the line of best fit for each data set.
- The company that makes Zoomers wants to determine which store is going to sell more pairs of shoes in one year. Which store will it be? Why?
- You are hired by Zoomers to design a new ad campaign for the shoe line. In which store would you spend more money for advertising? Why?

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Problem **Solving**

You are hired by Shoe Zoo for a summer job selling shoes. Each shift is 6 hours long. Your manager gives you three options for how you'll be paid:

Option A. \$10 per hour

Option B. \$5 per hour plus \$2 for every pair of shoes sold.

Option C. \$1 per hour plus \$6 for every pair of shoes sold.

1. Write an equation for each option where y is your total pay for a 6-hour shift and x is the number of pairs of shoes sold during your 6-hour shift.
2. Suppose you sell an average of 2 pairs of shoes per hour. Which option would you choose to earn the most money? How much money would you make?
3. Suppose you sell an average of 8 pairs of shoes per shift. Which option would you choose to earn the most money? How much money would you make?
4. How many pairs of shoes would you need to sell during one 6-hour shift to make Option B better than Option A?
5. How many pairs of shoes would you need to sell during one 6-hour shift to make Option C better than Option A?
6. How many pairs of shoes would you need to sell for Option B and Option C to pay the same amount?
7. Which option would you choose? Why?

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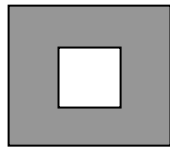
Lesson Objective: Choose and use an appropriate problem-solving strategy.



Guided Practice on Problem Solving Strategies

Directions: Work with a partner to solve each problem. Keep in mind any problem solving strategies you use. You will review your answers with your teacher when you have finished.

1. The virus population in a sample grows at the rate of 5% per hour. A new drug can kill 5,000 virus cells at a time. A scientist has a sample of 30,000 virus cells. After an hour, she adds the drug and kills 5,000 of the virus cells in the sample. They then continue to grow, and after another hour, she adds another dose of the drug. This continues until all of the virus cells are gone. How many hours will it take to kill all of the virus cells?
2. The area of a square is equal to its length times its width. Since these values are the same, we sometimes say that the area is the length of one side squared. A logo is made up of a square inside of another square, as shown below. The makers of the logo want the area of the shaded region to be 27 square inches. How long could the side of each square (the outer and the inner) be?



3. The area of a rectangle (which can change depending on x) is given by the equation $A = 2x^2 + 7x - 4$. The x represents an integer value. What is the smallest possible area for the rectangle?

The expressions for the side lengths of the rectangle are the factors of the original equation. What are the expressions that represent each side of the rectangle?

Problem **Solving**

Straight roads are being built to connect three cities: Albertsburg, Binghamton, and Clarksville. Use the information below to answer the questions.

- The cities do not all lie in a straight line.
- Along the new route, a drive from Binghamton to Clarksville and then to Albertsburg is 27 miles.
- A drive from Binghamton to Albertsburg and then to Clarksville is 21 miles.
- A drive from Clarksville to Binghamton, then to Albertsburg, then back to Clarksville is 36 miles.

How far is it from Albertsburg to Binghamton?

How far is it from Binghamton to Clarksville?

How far is it from Clarksville to Albertsburg?

What kind of triangle do the roads form? How do you know?