

Rational Word Problems: Average Cost & Work**Average Cost Examples:**

You have been selected to order the sophomore class shirts for Liberty. There are two different companies from which to choose. Terrific Ts charges a \$100 design fee to put your T-shirt design in the computer. They then charge \$6 per shirt ordered.

- A. Write an equation to represent the Cost of the shirts, C , in terms of the number t-shirts ordered, t .
- B. What would it cost to purchase 1 t-shirt?
- C. What is the cost per t-shirt if you buy:
- a. 5 shirts? _____ 10 shirts? _____ 100 shirts? _____
- D. Write an equation to find the Cost per t-shirt, C , if you buy t t-shirts.
- E. What is the domain? (ie the possible number of shirts you can buy)
- F. What is the range? (ie the lowest and highest possible cost per t-shirt)
- G. Why is there a limit to the lowest possible cost per t-shirt?

Totally t-shirts charges a \$50 design fee and then charges \$8 per t-shirt.

- H. Write an equation to find the Cost per t-shirt, C , If you buy t t-shirts.
- I. What is the domain? (ie the possible number of shirts you can buy)
- J. What is the range? (ie the lowest and highest possible cost per t-shirt)
- K. You expect to buy 75 t-shirts. Which company has the better deal and how much would you need to charge for the t-shirts to break even (ie what is the average cost of a t-shirt if you buy 75)?

You have two choices in Cell-phone contracts. Plan A is \$40 per month and includes everything, even a phone. Plan B is only \$30 per month, but you have to buy a phone for \$100.

A. What is the cost for 1 month of each service?

Plan A:

Plan B:

B. Write an equation to find the total cost of Plan B if you kept Plan B for m months.

C. To find the average monthly cost for plan B, you have to divide the total cost (part 2) by the number of months, m . Write the equation that represents average Cost per month for Plan B.

D. Put your equation from part 3 in "y=". Using the table, what happens to average cost as your number of months goes up?

E. Which plan has a lower average cost if you stay with the plan for 12 months?

F. What is the range of plan B average monthly cost? (ie what is the highest average monthly cost, ie keeping the plan for just 1 month and what is the lowest average monthly cost, ie if you keep the plan a really long time)

Work

Ms. Ray and Mrs. Blanton want to decorate their new classroom. If Ms. Ray works alone it will take her 2 hours and if Mrs. Blanton works alone it will take her 4 hours.

- A. If they work together to decorate their new room, do you think they would finish faster?
- B. What is rate at which Ms. Ray can decorate the room ($\frac{\#rooms}{hour(s)}$)?
- C. What is the rate at which Mrs. Blanton can decorate the room ($\frac{\#rooms}{hour(s)}$)?
- D. What is the rate at which they can both decorate the room together? ($\frac{\#rooms}{hour(s)}$...if you do not know one of the values leave it as x)?
- E. Now set up an equation. (Ray + Blanton = Together).
- F. Solve for x to find out how long it takes for them to paint the room together.

Ashley and Lindsay want to start a business painting fences. They figured out that they would paint a 200 ft fence in 40 minutes together. Ashley can paint the fence in 70 minutes alone.

- A. What is Ashley's rate? (think about this as painting 1 fence rather than 200 feet of fence and the work will be simpler.)
- B. What is Lindsay's rate?
- C. What is the rate they can decorate the room together?
- D. Write an equation: (Ashley + Lindsay = Together)
- E. How long would it take for Lindsay to paint the fence alone?

Mrs. Zurek is putting toys in a toy box at the same time her son, Noah is taking them out. Mrs. Zurek can fill the toy box in 3 minutes and her son can empty the box in 5 min.

- A. What is Mrs. Zurek's rate? (again think about this as 1 task)

- B. What is Noah's rate?

- C. Write the equation (Zurek – Noah = Together since they are working against each other in this situation.)

- D. How long will it take her to fill the box if Noah is emptying the box at the same time?

Kyle can paint a room in 4 hours. Cole can paint the same room in 3 hours.

- A. What is Kyle's rate?

- B. What is Cole's rate?

- C. Write an equation (Kyle + Cole = Together):

- D. If Kyle and Cole were to work together how long would it take to paint the room?