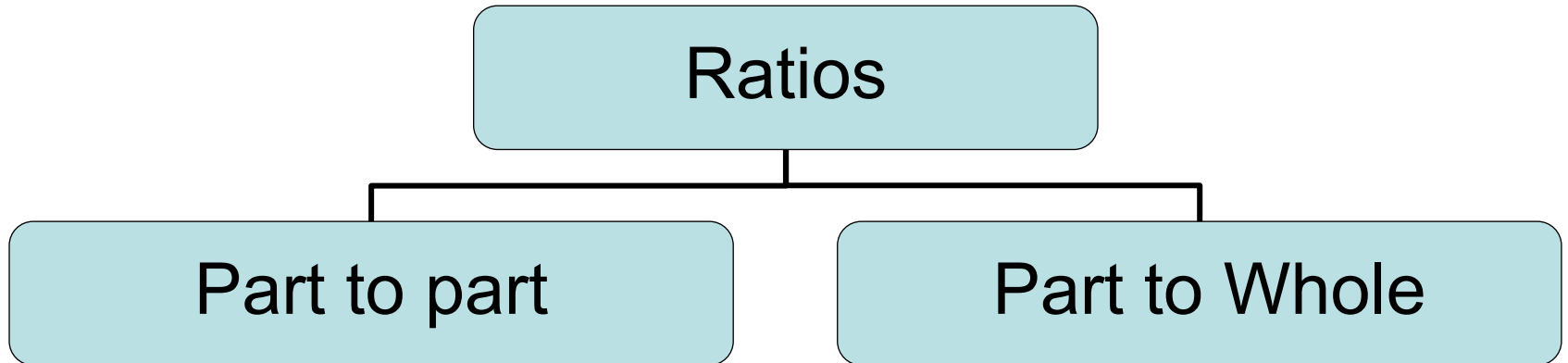


Proportional Reasoning

Ratios/Rates
Proportions

What do ratios compare?



What is a Ratio?

- A ratio is a comparison of two quantities by division.
- A ratio can be represented in 3 different ways, but they all mean the same thing.
- Order matters. Whatever is mentioned first in the question is what goes first in the ratio.

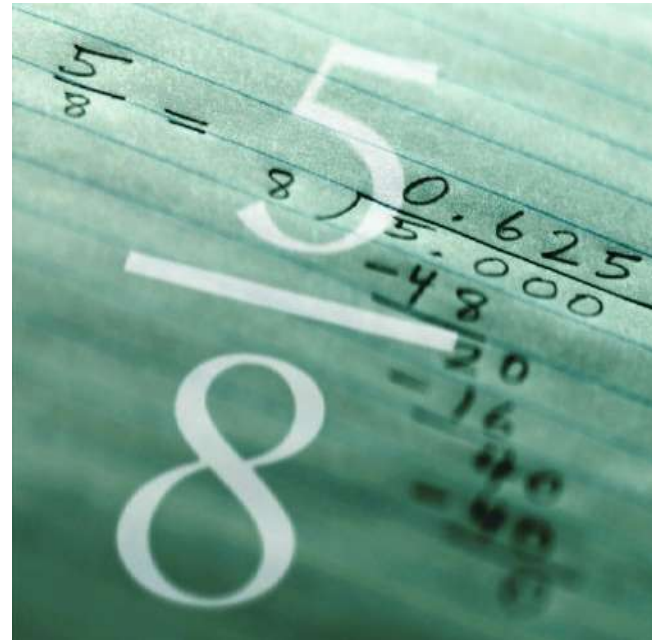
So, you might wonder....

- How does a person represent a ratio?

Here's how we represent ratios.

- Ratios can be represented as a fraction.

PartPart _____
PartWhole



Another way to represent ratios

- Ratios can be represented as a rate with a colon between the two numbers.

Part : Part 90:50

Part : Whole 90:140



Finally....

- Ratios can be written with words. For example, the fraction $2/3$ can be written as...

2 to 3 (part to part) (part to whole)

Or

2 out of 3 (part to whole)

The Exception to the Rule

- The word “to” is used when comparing part to part or part to whole.
- Only when expressing part to whole, can the phrase “out of” be used since this phrase refers to the whole.
- Part to Part
- Part to Whole or
- Part out of the Whole



FYI

- Ratios should be simplified to lowest term since they are fractions.



Real life example

- Mark shoots baskets every night to practice for basketball. While training, he will shoot 50 baskets. He usually makes 35 of those 50 baskets. Represent this data as a ratio.



Mathematically Speaking...

- This data can be represented as..

Baskets made 35
Baskets shot 50

35 : 50

35 to 50

35 out of 50

*Remember to simplify all fractions whenever possible



Once again...



Marla has 15 pants in her closet and 25 shirts to go with her pants. What is the ratio of pants to shirts in her closet?

Mathematically Speaking

- The ratio of pants to shirts in Marla's closet can be represented as...

Pants 15 _____
Shirts 25

Or 15:25 or 15 to 25
but not.....

Remember to simplify all fractions whenever possible.



Exception to the Rule



- We can not say this ratio using the phrase “out of” because we are comparing part to part...Does it make sense to say, “15 shirts out of 25 pants”?

Remember....

- A ratio is a comparison of two quantities by division.
- A ratio compares part to part or part to whole.
- A ratio can be written 3 different ways...

n/d $n:d$ or “n to d” or “n out of d”

Now it is your turn!



- Lennie is helping her husband David, package blankets and pillows for boys and girls in shelters. He has 108 blankets and 54 pillows. Write the ratio of pillows to blankets.

The ratio of what to what?

- You had to compare the pillows to the blankets.
- How many pillows were there?
- How many blankets?
- Is this a comparison of part to part or part to whole?



Time out



- Take this time to find the ratio of pillows to blankets.
- Write this ratio using the 3 different ways that you were taught.
- Be prepared to share your answers.

Is that your final answer?



- Pillows to blankets
- 54 pillows and 108 blankets
- Ratio as a fraction: $54/108$
- Ratio as a rate: 54:108
- Ratio with words: 54 to 108

Can you create ratios on your own?

- Use the next few slides to create the ratios presented in the examples.
- Be sure to write them 3 different ways.
- This is your TOD, you will receive a grade for this. Transfer your response on another sheet of paper just the LETTER...be sure to skip a line in between each answer.



Problem #1



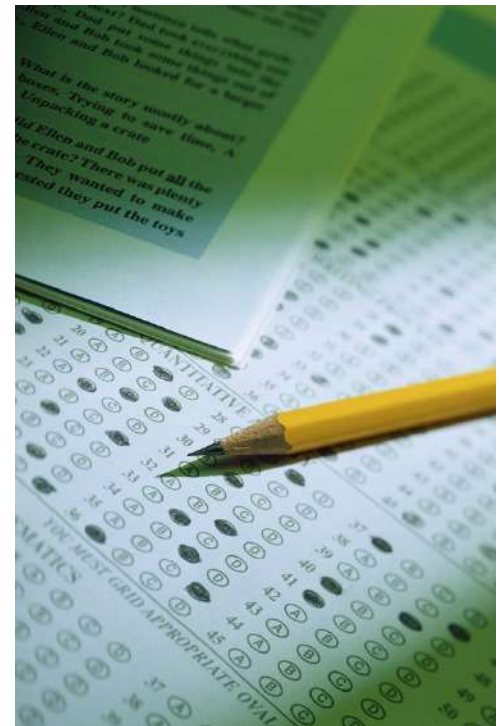
A recipe for pancakes requires 3 eggs and makes 12 pancakes. What is the ratio of eggs to pancakes?

- a) 12:3
- b) 1:4
- c) 3:1
- d) 1:3



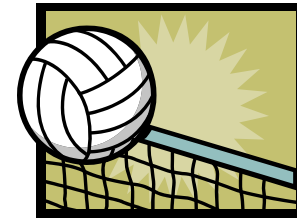
Problem #2

- Don took a test and got 15 out of 20 correct. What is the ratio of correct answers to total answers?
 - a) 1 to 2
 - b) 20 to 15
 - c) 4 to 3
 - d) 3 to 4





Problem #3



Arnold participated in volleyball for 8 hours and drama for 5 hours over a period of 1 week. If Arnold continues participating in these two activities at this rate, how many hours will he spend participating in each of the activities over a 9 week period?

- a) 45 hours of volleyball and 72 hours of drama
- b) 8 hours of volleyball and 5 hours of drama
- c) 72 hours of volleyball and 45 hours of drama
- d) 5 hours of volleyball and 8 hours of drama



Ratio Problem #4

The ratio of terror books to funny books in a library is 7 to 3. Which combination of terror to funny books could the library have?

- A) 21 terror to 9 funny
- B) 35 terror to 50 funny
- C) 14 terror to 9 funny
- D) 21 terror to 15 funny

Problem #5



- There were 14 boats and 42 people registered for a boat race. Which ratio accurately compares the number of people to the number of boats?

- A) 2:6
- B) 3:1
- C) 7:21
- D) 14:42