MATH 7: Week of April 20

Go through the slides (notes) and work through the examples on a separate piece of paper. Then do the given practice problems (again, on a separate piece of paper). Check your answers with the key given at the bottom of the practice page. Check your email for the schedule of online help sessions via Zoom.

L6: Writing and Solving Proportions - Continued

Target: Write and solve proportions.

Day 1: Slides 2-5
Day 2: Slides 6-9
Day 3: Slide 10
Day 4: Slide 11
Answers on Slide 12

Last week, we learned to solve proportions using cross products:

Solve the proportion $\frac{2}{3} = \frac{x}{15}$ using cross products.

- Write the cross products. $\qquad 3 \cdot x = 2 \cdot 15$
- Simplify the equation. $\qquad 3x = 30$
- Divide both sides by 3. $\qquad \dfrac{3}{3} \quad \dfrac{3}{3}$
$$x = 10$$

When you solve this, you are calculating: $\dfrac{2 \bullet 15}{3}$

That's the shortcut!

The shortcut: Multiply the numbers that are diagonal in the proportion, then divide by the number diagonal from the variable.

Example 1: $\frac{20}{m} = \frac{2.5}{3}$ To solve: $\frac{20 \cdot 3}{2.5}$
$$m = 24$$

(You can type it all in your calculator at the same time: $20 \times 3 \div 2.5 =$)

Example 2

a) $\frac{4}{6} = \frac{y}{9}$ To solve: $\frac{4 \cdot 9}{6}$ $\qquad y = 6$

b) $\frac{x}{20} = \frac{3}{15}$ To solve: $\frac{20 \cdot 3}{15}$ $\qquad x = 4$

L6 Practice Problems: Solve the proportions using the solving shortcut.

1. $\frac{1}{4} = \frac{x}{12}$

2. $\frac{5}{6} = \frac{10}{y}$

3. $\frac{20}{14} = \frac{a}{7}$

4. $\frac{x}{24} = \frac{3}{8}$

5. $\frac{6}{12} = \frac{y}{8}$

6. $\frac{3}{15} = \frac{1}{b}$

7. $\frac{2}{5} = \frac{x}{50}$

8. $\frac{12}{30} = \frac{x}{10}$

End Day 1

Math 7: Lesson 7
(Day 2)

Problem Solving with Proportions

Target:
Solve problems by writing and solving proportions.

Solving Problems Using Proportions

1. Identify the variable and what it represents.

2. Write a proportion. Make sure the placement of the units match in each ratio.

3. Solve the proportion.

4. Answer the question with a complete sentence.

Example 1

Students help run a summer soccer camp. Two students are needed for every 15 elementary school soccer players. There are 195 soccer players signed up. How many students are needed?

- Let x = number of students needed.
- Write a proportion.

$$\frac{2 \text{ students}}{15 \text{ players}} = \frac{x \text{ students}}{195 \text{ players}}$$

- Solve the proportion: $\frac{2 \cdot 195}{15}$ $\qquad x = 26$

- There are 26 students needed for the soccer camp.

Example 2

Mandy read 180 pages in 4 hours. How long will it take her to read a 225 page book at this rate?

- Let x = number of hours for Mandy to read a 225 page book.

- Write a proportion.

$$\frac{180 \text{ pages}}{4 \text{ hours}} = \frac{225 \text{ pages}}{x \text{ hours}}$$

- Solve the proportion: $\frac{4 \cdot 225}{180}$ $\qquad x = 5$

- It will take Mandy 5 hours to read a 225 page book.

End Day 2

Day 3: L7 Practice Problems: Find each answer by writing and solving a proportion.

1. A bicyclist rides 18 miles in 2 hours. How far will the bicyclist ride at this speed in 5 hours?

2. Four posters cost $19.20. How many posters can you buy for $48.00?

3. You paid $28.00 for 8 gallons of gasoline. How much would you pay for 15 gallons of gasoline?

4. Tabitha walked 13.5 miles in three hours. At that speed, how many miles will she walk in seven hours?

Day 4: L7 Practice Problems: Find each answer by writing and solving a proportion.

5. Luis found a new text messaging plan which will charge him $2.00 for 80 messages. Using this plan, how much would he pay for 900 text messages in one month?

6. A truck driver travels 93 miles in 1 hour and 30 minutes. At this rate, how far will he travel in 4 hours?

7. Mark walked 21,129 <u>feet</u> in one hour. At that speed, about how many <u>miles</u> will he walk in two hours?

8. A 12 ounce soda costs $1.25 in the vending machine. At that rate, how much would a 32 ounce soda cost?

Answers

Day 1: Lesson 6

1. $x = 3$
2. $y = 12$
3. $a = 10$
4. $x = 9$
5. $y = 4$
6. $b = 5$
7. $x = 20$
8. $x = 4$

(Day 2: Notes examples)

Day 3: Lesson 7
1. 45 miles
2. 10 posters
3. $52.50
4. 31.5 miles

Day 4: Lesson 7
5. $22.50
6. 248 miles
7. 8 miles
8. $3.33