Math 7: Week of May 18th

Lesson 18: Percent of Change

Lesson 19: Percent Applications

Targets:

Find the percent of increase or the percent of decrease between two numbers.

Use percent of change to find new values.

Solve problems involving mark-ups, discounts, tips and taxes.

Directions:

- Go through the slides (notes) and work through the examples on a separate piece of paper.
- Complete the practice problems on a separate piece of paper.
- Check your answers with the key given at the end of the lesson. If you got any incorrect, use the right answer to problem solve and find the error.
- Check Google Classroom and/or your school email for the schedule of online help sessions.

Lesson 18

Vocabulary

- Percent of Change: The percent a quantity *increases or decreases* compared to the original amount.
- Percent of Increase: The percent of change when the new amount is *more* than the original amount.
- Percent of Decrease: The percent of change when the new amount is *less* than the original amount.

Percent of Change Equation

$$\text{Percent of Change} = \frac{\text{amount of change}}{\text{original amount}}$$

The amount of change is the absolute value of the difference between the new amount and the original amount.

Example 1

Find the percent of increase from 10 to 18.

1. Calculate the amount of increase. $18 - 10 = 8$
2. Calculate the percent of increase.

$$\frac{\text{amount of increase}}{\text{original amount}} = \frac{8}{10} = 0.8 = 80\%$$

The percent of increase from 10 to 18 is **80%**.

Example 2

Find the percent of decrease from 25 to 21.

1. Calculate the amount of decrease. $25 - 21 = 4$
2. Calculate the percent of decrease.

$$\frac{\text{amount of decrease}}{\text{original amount}} = \frac{4}{25} = 0.16 = 16\%$$

The percent of decrease from 25 to 21 is **16%**.

Example 3

In 1999, Hernandez paid $2,000 for a new laptop computer. In 2007, Hernandez paid 60% less for a laptop computer than he had in 1999. Find the amount he paid in 2007.

- Use the percent of change equation. $\text{Percent of decrease} = \frac{\text{amount of decrease}}{\text{original amount}}$
- Write the percent as a decimal. $0.6 = \frac{x}{2000}$
- Multiply both sides by 2,000. $1200 = x$
- Hernandez paid $1,200 *less* in 2007 than in 1999.
- Subtract 1200 from the value in 1999. $2000 - 1200 = 800$

Hernandez paid **$800** for a laptop computer in 2007.

Practice~ ***Lesson 18:*** Percent of Change

Use a separate piece of paper:

Identify the percent of change as an increase or a decrease. Find the percent of change. Round percents to the nearest tenth if necessary.

1. 20 to 25 **2.** 45 to 60 **3.** 15 to 9

4. 72 to 36 **5.** 15 to 18 **6.** 24 to 18

7. 100 to 70 **8.** 5 to 12 **9.** 10 to 14

Practice~ *Lesson 18:* Percent of Change

Use a separate piece of paper:
Find the percent of change. Round percents to the nearest tenth if necessary.

10. Charlie started his candy sale with 48 candy bars. Now he has 32 candy bars. Find the percent decrease.

11. Makaela had 200 baseball cards last month. This month she has 210. Find the percent of increase.

12. Last year there were 120 students in choir. This year, 30% more students took choir. How many students are taking choir this year?

Lesson 19~

Vocabulary

- Mark-up: The increase in the price of an item.
- Discount: The decrease in the price of an item.
- Sales Tax: An amount added to the cost of an item. The amount added is a percent of the original amount as determined by a state, county or city.

Example 1

A pawn shop owner buys a ring for $75 and sells it at an 80% mark-up. Find how much the ring sold for.

→ Method 1: Proportions $\frac{80}{100} = \frac{x}{75} \rightarrow 100x = 6000 \rightarrow x = 60$

→ Method 2: Percent Equation
$x = 80\% \cdot 75$
$x = 0.8 \cdot 75$
$x = 60$

→ Method 3: Percent of Increase $0.8 = \frac{x}{75} \rightarrow x = 60$

The markup is $60. The total price is 60 + 75 = **$135**.

Example 2

Sesily found an outfit that is 20% off the original price of $68. Find the discounted price of the outfit.

→ Method 1: Proportions $\frac{20}{100} = \frac{x}{68} \rightarrow 100x = 1360 \rightarrow x = 13.6$

→ Method 2: Percent Equation
$x = 20\% \cdot 68$
$x = 0.2 \cdot 68$
$x = 13.6$

→ Method 3: Percent of Increase $0.2 = \frac{x}{68} \rightarrow x = 13.6$

The discount is $13.60. The sale price is 68 – 13.60 = **$54.40**.

Example 3

Leah bought a new stereo in Seattle, Washington for $250. Find the actual amount she paid at the checkout if she was charged the state sales tax of 6.5%.

1. Find 6.5% of $250.
2. Use the percent equation. $x = 0.065 \cdot 250$, $x = 16.25$
3. Add the tax to the total. 16.25 + 250 = $266.25

Leah would pay **$266.25** for the stereo.

Practice~ *Lesson 19:* Percent Applications

Use a separate piece of paper:

Find the value of each markup or discount.

1. original: $40.00
percent of markup: 8%

2. original: $20.00
percent of discount: 40%

3. original: $25.00
percent of discount: 10%

4. original: $45.00
percent of markup: 20%

Find each selling price.

5. original: $15.00
percent of markup: 15%

6. original: $80.00
percent of markup: 25%

7. original: $100.00
percent of discount: 62%

8. original: $32.00
percent of discount: 50%

Use a separate piece of paper:

Jakin leaves a 15% tip each time he goes out to eat. Jakin's last two bills are shown below. What was the total amount he spent on each trip including tip?

9. $48.00 **10.** $32.40

11. Kim bought a hat in California. The hat cost $15 before the 8% sales tax was applied. How much did Kim pay for the hat after taxes were added?

Practice Answers:

Check your work!

Answers Provided Here!

If you're stuck, ASK! Help sessions are provided each week. Check Google Classroom for dates and times.

Worksheet 18

1. increase; 25%
2. increase; $33\frac{1}{3}\%$
3. decrease; 40%
4. decrease; 50%
5. increase; 20%
6. decrease; 25%
7. decrease; 30%
8. increase; 140%
9. increase; 40%
10. $33\frac{1}{3}\%$
11. 5%
12. 156 students

Worksheet 19

1. $3.20
2. $8.00
3. $2.50
4. $9.00
5. $17.25
6. $100.00
7. $38.00
8. $16.00
9. $55.20
10. $37.26
11. $16.20

FINAL SLIDE FOR MATH 7!