Percent change

Percent change is a way to describe a change in quantities. It helps you compare a new value to an old value.

Percent change can be an increase or decrease:

- A percent **increase** happens when the new value is **more** than the original value. For example, if the weight of a puppy went up over a month, you would have a percent increase.
- A percent **decrease** happens when the new value is **less** than the original value. For example, if the population of a town went down over a year, you would have a percent decrease.

How do you calculate percent change?

Percent change can be calculated using this formula:

$$\text{percent change} = \frac{\text{amount of change}}{\text{original amount}}$$

Let's try it! What is the percent change from 25 to 40?

Use the percent change formula. To find the amount of change, find the difference between 40 and 25. Divide that by the original amount, 25.

$$\text{percent change} = \frac{40 - 25}{25}$$

$$= \frac{15}{25}$$

$$= 0.6$$

Now, write 0.6 as a percent.

$$0.6 \rightarrow 60\%$$

Last, figure out if the percent change is an increase or a decrease. Since the value went from 25 up to 40, it is a percent increase.

So, the percent change from 25 to 40 is a 60% increase!

Another example

Yesterday, the high temperature in Greenville was 64°F. Today, the high temperature in Greenville is 48°F. What is the percent change from 64°F to 48°F?

Use the percent change formula. To find the amount of change, find the difference between 64 and 48. Divide that by the original amount, 64.

$$\text{percent change} = \frac{64 - 48}{64}$$

$$= \frac{16}{64}$$

$$= 0.25$$

Now, write 0.25 as a percent.

$$0.25 \rightarrow 25\%$$

Last, figure out if the percent change is an increase or a decrease. Since the high temperature went from 64°F down to 48°F, it is a percent decrease.

So, the percent change in high temperature in Greenville from yesterday to today is a 25% decrease.

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What is the percent of increase from 29.3 to 58.6?

Write your answer using a percent sign (%).

Percent of change BL7

How do you calculate the original amount?

You can also use the percent change formula to calculate the original amount, given the new amount and the percent change.

Let's try it! A sweater is on sale for $30, which is 20% less than its original price. What is the original price of the sweater?

Write the percent change, 20%, as a decimal, 0.2. The new amount is 30. Use n to represent the original price. To find the amount of change, subtract the sale price, 30, from the original price, n.

$$\text{percent change} = \frac{\text{amount of change}}{\text{original amount}}$$

$$0.2 = \frac{n - 30}{n}$$

$$0.2 \cdot \mathbf{n} = \frac{n - 30}{n} \cdot \mathbf{n} \qquad \textit{Multiply by } \mathrm{n} \textit{ on both sides.}$$

$$0.2n = n - 30$$

$$0.2n - \mathbf{n} = n - 30 - \mathbf{n} \qquad \textit{Subtract } \mathrm{n} \textit{ from both sides.}$$

$$-0.8n = -30$$

$$\frac{-0.8n}{\mathbf{-0.8}} = \frac{-30}{\mathbf{-0.8}} \qquad \textit{Divide both sides by } -0.8.$$

$$n = 37.5$$

So, the original price of the sweater was $37.50!

Another method

You can also solve this problem using a different method. The sweater costs 20% less than 100% of the original price:

100% of original price – 20% of original price = 80% of original price

So, the sweater costs 80% of the original price. This means that the sale price of $30 is 80% of the original price, n. Write an equation to show this.

$$30 = 0.8n$$

Now, solve the equation for n.

$$30 = 0.8n$$

$$\frac{30}{0.8} = \frac{0.8n}{0.8}$$ *Divide both sides by* 0.8.

$$37.5 = n$$

Solving with this method also shows that the original price of the sweater was $37.50.

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Maria, a professional golfer, has an average score of 92 points so far this season, which is 15% higher than her average score last season. What was Maria's average score last season?

_____ points

Percent of change: find the original amount word problems RCM

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Percent of change: word problems 54S

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