

Bell Work

It takes 7 minutes for Isabella to walk around the track twice.
At this rate, how many times can she walk around the track in
a half hour?

Lesson 2.7 (Percent of Change)

Objectives:

- Find the percent of change.**
- Solve problems involving percent of change.**

Percent of Change - the ratio of the change in an amount to the original amount (expressed as a percent)

$$\frac{\text{Change}}{\text{Original Amount}} = \frac{\text{Percent of Change}}{100}$$

Examples

a. original: 20
final: 23

Subtract the original amount from the final amount to find the amount of change: $23 - 20 = 3$.

Since the new amount is greater than the original, this is a percent of increase.

Use the original number, 20, as the base.

$$\begin{array}{l} \text{change} \rightarrow \frac{3}{20} = \frac{r}{100} \\ \text{original amount} \rightarrow \end{array}$$

$$3(100) = r(20)$$

$$300 = 20r$$

$$\frac{300}{20} = \frac{20r}{20}$$

$$15 = r$$

The percent of increase is 15%.

b. original: 25
final: 17

Subtract the original amount from the final amount to find the amount of change: $17 - 25 = -8$.

Since the new amount is less than the original, this is a percent of decrease.

Use the original number, 25, as the base.

$$\begin{array}{l} \text{change} \rightarrow \frac{-8}{25} = \frac{r}{100} \\ \text{original amount} \rightarrow \end{array}$$

$$-8(100) = r(25)$$

$$-800 = 25r$$

$$\frac{-800}{25} = \frac{25r}{25}$$

$$-32 = r$$

The percent of decrease is 32%.

Practice

1A. original: 66
new: 30

1B. original: 9.8
new: 12.1

CRUISE The total number of passengers on cruise ships increased 10% from 2007 to 2009. If there were 17.22 million passengers in 2009, how many were there in 2007?

Let f = the number of passengers in 2007. Since 10% is a percent of increase, the number of passengers in 2009 is less than the number of passengers in 2007.

change →	$\frac{17.22 - f}{f} = \frac{10}{100}$	Percent proportion
original amount →		
	$(17.22 - f)100 = 10f$	Find the cross products.
	$1722 - 100f = 10f$	Distributive Property
	$1722 - 100f + 100f = 10f + 100f$	Add $100f$ to each side.
	$1722 = 110f$	Simplify.
	$\frac{1722}{110} = \frac{110f}{110}$	Divide each side by 110.
	$15.65 \approx f$	Simplify.

There were approximately 15.65 million passengers in 2007.

Sales Tax - Percent of Increase

SHOPPING Marta is purchasing wire and beads to make jewelry. Her merchandise is \$28.62 before tax. If the tax is 7.25% of the total sales, what is the final cost?

Step 1 Find the tax.

The tax is 7.25% of the price of the merchandise.

$$\begin{aligned} 7.25\% \text{ of } \$28.62 &= 0.0725 \times 28.62 && 7.25\% = 0.0725 \\ &= 2.07495 && \text{Use a calculator.} \end{aligned}$$

Step 2 Find the cost with tax.

Round \$2.07495 to \$2.07 since tax is always rounded to the nearest cent.

Add this amount to the original price: $\$28.62 + \$2.07 = \$30.69$.

The total cost of Marta's jewelry supplies is \$30.69.

Discounts - Percent of Decrease

DISCOUNT Since Tyrell has earned good grades in school, he qualifies for the Good Student Discount on his car insurance. His monthly payment without the discount is \$85. If the discount is 20%, what will he pay each month?

Step 1 Find the discount.

The discount is 20% of the original payment.

$$\begin{aligned} 20\% \text{ of } \$85 &= 0.20 \times 85 && 20\% = 0.20 \\ &= 17 && \text{Use a calculator.} \end{aligned}$$

Step 2 Find the cost after discount.

Subtract \$17 from the original payment: $\$85 - \$17 = \$68$.

With the Good Student Discount, Tyrell will pay \$68 per month.

Practice

SHOPPING A new DVD costs \$24.99. If the sales tax is 6.85%, what is the total cost?

SALES A picture frame originally priced at \$14.89 is on sale for 40% off. What is the discounted price?

Homework

Worksheet