7.5 Percent of Change

Goal: Find a percent of change in a quantity.

Vocabulary

Percent of change: an increase or decrease in a quantity

Percent of increase: ex: sales tax increases by 6%

Percent of decrease: ex: 25% off coupon

Percent of Change

The percent of change is the ratio of the amount of increase or decrease to the original amount.

$$\text{Percent of change, } p\% = \frac{\text{Amount of increase or decrease}}{\text{Original amount}}$$

change / original

Example 1 *Finding a Percent of Increase*

Enrollment A school had 720 students enrolled last year. This year, 745 students are enrolled. By about what percent did the number of students change from last year to this year?

last year: 720 this year: 745

$p\% = \frac{\text{Amount of increase}}{\text{Original amount}}$ Write formula for percent of increase.

$= \frac{745 - 720}{720}$ Substitute.

$= \frac{25}{720}$ Subtract.

$\approx 0.0347 = 3\%$ Divide. Then write decimal as a percent.

Answer: The number of students increased by about 3 %.

Example 2 *Finding a Percent of Decrease*

Find the percent of decrease from 576 to 216.

$p\% = \frac{\text{Amount of decrease}}{\text{Original amount}}$ — Write formula for percent of decrease.

$= \frac{576 - 216}{576}$ — Substitute

$= \frac{360}{576}$ — Subtract.

$= \frac{\square}{\square} = 0.625$ — Simplify fraction. Then write the fraction as a percent.

Answer: The percent of decrease is 62.5 %.

Example 3 *Using a Percent of Increase*

Ticket Prices A professional baseball team announces that the average ticket price to one of their games will be 8% more than last year. If the average price of a ticket was $12 last year, how much will the average ticket cost this year?

Solution

To find the average ticket cost this year, you need to increase the average ticket cost last year by 8%.

0.08

Ticket cost this year	=	Ticket cost last year	+	Amount of increase	
	=	12	+	8% · 12	Substitute.
	=	12	+	0.08 · 12	Write percent as a decimal.
	=	12 + 0.96			Evaluate.

Answer: This year, the average ticket will cost $ 12.96

Example 4 *Finding a New Amount*

Tuna In 1990, the average price per pound of light chunk tuna was $2.11. By 2001, the average price per pound had decreased by 7.1%. What was the average price per pound in 2001?

Solution

To find a new amount, do one of the following.
- For a p% increase, multiply the original amount by (100% + p%).
- For a p% decrease, multiply the original amount by (100% − p%).

Price in 2001 = Price in 1990 · (100% − p%)

= 2.11 · (100% − 7.1%) Substitute.

= 2.11 · 92.9% Subtract percents.

= 2.11 · 0.929 Write percent as a decimal.

= $1.96 Multiply.

Answer: The average price per pound in 2001 was about $1.96.

"off"

$2.11 − 7.1% of $2.11

2.11 − (0.071 · 2.11)

$2.11 − 0.1498

$2.11 − 0.15

$1.96

"on"

Checkpoint **Find the percent of increase.**

1. Original: 25
   New: 31

change / original = 31−25 / 25 = 6/25

0.24 → 24%

2. Original: 150
   New: 195

change / original = 195−150 / 150 = 45/150

0.30 → 30%

Find the new amount.

3. Increase 54 by 25%.

method 1
54 + (25% of 54)
54 + (0.25 · 54)
54 + 13.5
67.5

100% + 25% = 125%

method 2
125% of 54
1.25 · 54
67.5

4. Decrease 78 by 40%.

method 1 "off"
78 − (40% of 78)
78 − (0.4 · 78)
78 − 31.2
46.8

method 2 "on"
100% − 40% = 60%
60% of 78
0.6 · 78
46.8