3 Percent

3.1 Introduction to Percents

3.2 Part, Rate, and Base

3 Percent

EXAMPLES of everyday Uses of Percent:

- Percents are used in reporting the cost of living, unemployment, commissions, sales, discounts, tax rates, and interest rates.

3.1 Introduction to Percents

OBJECTIVES

1. Identify terms used with percents.
2. Write a percent as a decimal.
3. Write a decimal as a percent.
4. Write a percent as a fraction.
5. Write a fraction as a percent.
6. Use Excel to format a percent, decimal, or fraction.

OBJECTIVE 2 Write a percent as a decimal.

Example

Write the decimal equivalent for 35%.

STEPS

Drop the percent symbol and divide the number by 100.

$$100\overline{)35.00} = 0.35$$

OBJECTIVE 2 Write a percent as a decimal.

Example

Write 42% as its decimal equivalent.

STEPS

Drop the percent symbol and move the decimal point 2 places to the left, adding zeros as needed.

$42\% = 0.42_{\wedge} = 0.42$

OBJECTIVE 2 Write a percent as a decimal.

Example

Write $8\frac{1}{4}\%$ as a decimal.

STEPS

Convert the fractional part of the mixed number to a decimal.

$8\frac{1}{4}\% = 8.25\%$

Convert the resulting percent to its decimal equivalent.

$8.25\% = 0.08.25 = 0.0825$

OBJECTIVE 3 Write a decimal as a percent.

Example

Write 0.157 as a percent.

STEPS

Multiply the decimal number by 100 and add the percent symbol.

$0.157 \times 100 = 15.7\%$

OBJECTIVE 3 Write a decimal as a percent.

Example

Convert 0.05 to a percent.

STEPS

Move the decimal point 2 places to the right, adding zeros as needed. Then add a percent symbol.

0.05 = 0.05. = 5%

OBJECTIVE 4 Write a percent as a fraction.

Example

Convert 5% to a fraction.

STEPS

Drop the percent symbol and write a fraction, placing the percent as the numerator and 100 as the denominator. Reduce the fraction to lowest terms.

$$5 = \frac{5}{100} = \frac{1}{20}$$

OBJECTIVE 4 Write a percent as a fraction.

Example

Write 12.5% as a fraction.

STEPS

Change the percent to a decimal.

12.5% = 0.125

Change the decimal to a fraction and reduce.

$$0.125 = \frac{125}{1,000} = \frac{1}{8}$$

OBJECTIVE 4 Write a percent as a fraction.

Example

Write $8\frac{2}{3}\%$ as a fraction.

STEPS

Drop the percent symbol and divide the percent by 100. Remember to invert the divisor and multiply.

$$8\frac{2}{3} \div 100$$

$$8\frac{2}{3} = \frac{26}{3}$$

$$\frac{26}{3} \times \frac{1}{100} = \frac{13}{150}$$

OBJECTIVE 5 Write a fraction as a percent.

Example

Write $\frac{1}{5}$ as a percent.

STEPS

Convert the fraction to its decimal equivalent.

$$\frac{1}{5} = 0.20$$

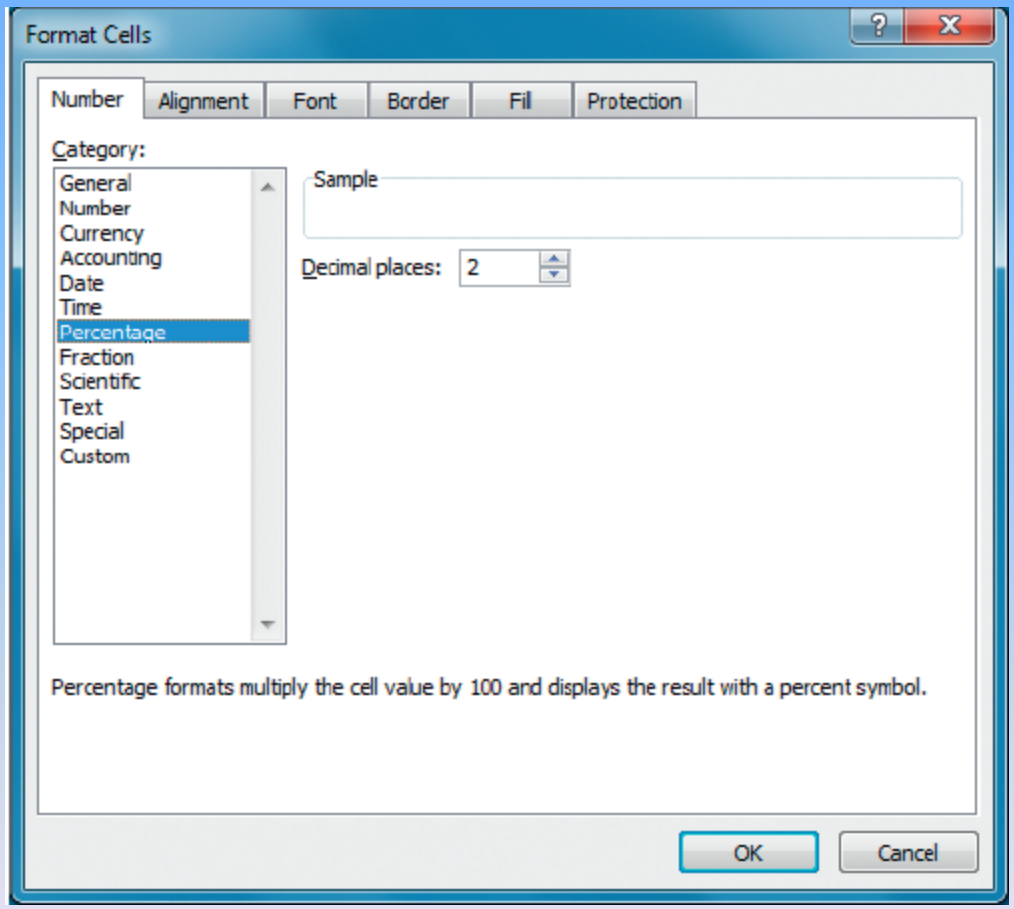
Convert the decimal to a percent.

$0.20 = 0.20\% = 20\%$

OBJECTIVE 6 Use Excel to format a percent, decimal, or fraction.

Example

To change to a different number format, open the Format cells dialog box.



OBJECTIVE 6 Use Excel to format a percent, decimal, or fraction.

Example

Format each percent as a decimal.

	A	B	C	D	E	F
3	**A. Format percents as decimals.**					
4	112.00%	92.00%	210.30%	25.50%	52.00%	2.75%
	1.12	0.92	2.103	0.255	0.52	0.0275

STEPS

For Cell A4: Click on the Format Cells Number tab and choose Category General.

OBJECTIVE 6 Use Excel to format a percent, decimal, or fraction.

Example

Format each decimal as a percent.

	A	B	C	D	E	F
6	**B. Format decimals as percents.**					
7	0.0075	0.4	0.325	0.123	0.85	0.03
	0.75%	40.00%	32.50%	12.30%	85.00%	3.00%

STEPS

For Cell A7: Click on the Format Cells Number tab and choose Category Percentage.

OBJECTIVE 6 Use Excel to format a percent, decimal, or fraction.

Example

Format each percent as a fraction.

	A	B	C	D	E	F
9	**C. Format percents as fractions.**					
10	14.06%	36.08%	28.27%	20.00%	88.71%	12.30%
	89/633	162/449	67/237	1/5	55/62	23/187

STEPS

For Cell A10: Click on the Format Cells Number tab and choose Category Fraction and “Up to three digits” for the Type.

OBJECTIVE 6 Use Excel to format a percent, decimal, or fraction.

Example

Format each fraction as a percent.

	A	B	C	D	E	F
12	**D. Format fractions as percents.**					
13	3/8	3/5	13/100	1/6	6/7	1/3
	37.50%	60.00%	13.00%	16.67%	85.71%	33.33%

STEPS

For Cell A13: Click on the Format Cells Number tab and choose Category Percentage.

3.2 Part, Rate, and Base

OBJECTIVES

1. Identify the terms part, rate, and base.
2. Find the part.
3. Find the rate.
4. Find the base.
5. Identify the elements of percent problems.
6. Use Excel to find the part, rate, and base.

3 Percent

Everyday Examples of the Uses of Percent:

- Figure the dollar amount of your 5% pay raise.
- How to figure the percent of return on an investment to determine whether you should make the investment.

3 Elements of Percent

Part – piece of the base.

Base – represents 100% or whole of something,

Rate – percentage or fraction the part is of the base.

3 Examples of Uses of Percent

Usually is the BASE	Usually is the PART
SALES	SALES TAX
VALUE OF BONDS	DIVIDENDS
RETAIL PRICE	DISCOUNT
VALUE OF REAL ESTATE	APPRECIATION
SAVINGS	INTEREST
TOTAL SALES	COMMISSION

3 Formula

Part = Base x Rate

Part ÷ Base = Rate

Part ÷ Rate = Base

OBJECTIVE 2 Find the part.

Example

What is a 30% discount on a $150 jacket?

STEPS

Problem Solving Plan		
Clues	**Action Plan**	**Solve**
Base is $150. Rate is 30%. Part is unknown.	Change the decimal to a percent. To determine the part, P, multiply the base, B, by the rate, R.	$30\% = 0.30$ $P = B \times R$ $P = \$150 \times 0.30$ $P = \$45$
Conclusion		
A 30% discount on a $150 jacket is $45.		

OBJECTIVE 2 Find the part.

Example

What is 6.5% of 130?

STEPS

Identify each element. Base is 130. Rate is 6.5%. Part is unknown.

Change the percent to a decimal.
6.5% = 0.065

Apply the formula: Part = Base × Rate
Part = 130 × 0.065
Part = 8.45
So, 8.45 (part) is 6.5% (rate) of 130 (base).

OBJECTIVE 2 Find the part.

Example

Suppose you had a gain of $6\frac{1}{4}$ % on $400. What was the gain?

STEPS

Change the percent to a decimal.

$$6\frac{1}{4}\% = 6.25\% = 0.0625$$

Apply the formula: Part = Base × Rate

Part = $400 × 0.0625

Part = $25.00

The gain was $25.

OBJECTIVE 3 Find the rate.

Example

Find what percent $15 is of $139.

STEPS

Identify the elements.

What percent of $139 is $15?

↑ base ↑ part

Apply the formula: Rate = Part ÷ Base

Rate = 15 ÷ 139 = 0.108

Change the decimal to a percent.

Rate = 0.108 × 100 = 10.8%

OBJECTIVE 4 Find the base.

Example

$1,325 is 9.5% of what amount?

STEPS

Identify the elements.

Part is $1,325. Rate is 9.5%. What is the base?

Rate as a decimal: 9.5% = 0.095

Apply the formula: Base = Part ÷ Rate

Base = $1,325 ÷ 0.095

Base = $13,947.37

OBJECTIVE 6 Use Excel to find the part, rate, and base.

Example

What percent of the $1,494,095 total sales is each employee's sales?

	A	B	C	D	E	F
4	Sales--Southwest Region First Quarter, 2002					
5						
6	**Employees**	**January**	**February**	**March**	**1st Quarter**	**Percent of Total**
7	H. Ramario	$122,645	$117,324	$115,378	$355,347	23.78%
8	G. Gomez	$118,748	$113,821	$117,251	$349,820	23.41%
9	C. Chan	$129,749	$151,947	$136,247	$417,943	27.97%
10	W. Smith	$109,431	$137,697	$123,857	$370,985	24.83%
11	**Totals**	$480,573	$520,789	$492,733	$1,494,095	100.00%

STEPS

For Cell F7: =E7/E11

Use the fill handle to copy the formula into Column F.