

M9

Percentage Discounts

8.3

- A percentage is a special ratio when the whole is represented by a100 (or 1).
- A percentage can be expressed as a fraction, decimal, or a percentage with %.

Examples: Fill in the table.

Fraction	Percentage with %	Decimal
$\frac{1}{4}$	25%	0.25
$\frac{3}{4}$	75%	0.75
$\frac{30 \div 10}{100 \div 10} = \frac{3}{10}$	30%	0.30

- To find 10% of a number, divide the number by 10 OR move the decimal point by one place value to the **left**.
- To find 10% of a number while using a calculator, multiply the number by 0.1.

Examples: Find 10% of each number.

250	45	13	5.0	0.8	1378.0
25	4.5	1.3	0.5	0.08	137.8

- To find 5% of a number, divide the number by 10 and then by 2.
- To find 5% of a number while using a calculator, multiply the number by 0.05.

Examples: Find 5% of each number.

100%	150	80.0	64	5	0.1	125
10%	15	8	6.4	0.5	0.01	12.5
5%	7.5	4	3.2	0.25	0.005	6.25

➤ To find 50% of a number, divide the number by 2.

Examples: Find 50% of each number.

100%	150	80	64	5	0.1	125
50%	75	40	32	2.5	0.05	62.5

Percentage Formula:

$$\frac{\text{is}}{\text{of}} = \frac{\%}{100}$$

Examples:

1. What is 61% of 345?

$$\frac{\text{is}}{\text{of}} = \frac{\%}{100} \rightarrow \frac{x}{345} = \frac{61}{100}$$

$$x = \frac{345 \cdot 61}{100}$$

$$x = 210.45$$

$$\frac{345}{1} \cdot \frac{x}{345} = \frac{61}{100} \cdot \frac{345}{1}$$

$$x = \frac{61}{100} \cdot \frac{345}{1}$$

$$x = \frac{345 \cdot 61}{100}$$

$$x = 210.45$$

2. What is 3.5% of 1057?

$$\frac{\text{is}}{\text{of}} = \frac{\%}{100}$$

$$\frac{x}{1057} = \frac{3.5}{100}$$

$$x = 36.995$$

$$x = \frac{(1057)(3.5)}{100}$$

Sale Prices = discounted price

- Change the percentage into a decimal.
- Multiply the original price by this decimal to find the discount.
- Subtract the discount from the original price to find the sale price.

Examples: Determine the **sale price** for each scenario.

1. Original price: \$ 52.00; Promotion: 18% off

$$(52.00)(0.18) = 9.36$$

Discount: \$ 9.36

$$52.00 - 9.36 = 42.64$$

Sale price: \$ 42.64

2. Original price: \$348.00; Promotion: 30% off

$$(348.00)(0.30) = 104.40$$

Discount: \$ 104.40

$$348.00 - 104.40$$

Sale price: \$ 243.60

2. Original price: \$ 109.50; Promotion: 28% off

$$(109.50)(0.28) = 30.66$$

Discount: \$ 30.66

$$109.50 - 30.66 = 78.84$$

Sale price: \$ 78.84

Solving for "x" when "x" is in the denominator

$$\frac{\text{is}}{\text{of}} = \frac{\%}{100}$$

Q: 39 is 72% of what number?

$$\frac{39}{x} = \frac{72}{100}$$

$$(100)(39) = 72 \cdot x$$

$$\frac{3900}{72} = \frac{72x}{72}$$

$$54.\overline{16} = x$$

\therefore 39 is 72% of $54.\overline{16}$