

Key

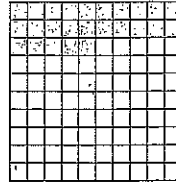
Each small square of a hundredths chart represents  $\frac{1}{100}$  of 1%, or  $\frac{1}{100}$  %, or 0.01%.

$\frac{1}{4}$  of 1% or  $\frac{1}{4}$  % can be represented on the hundredths chart by shading  $\frac{1}{4}$  of the hundredths chart, which is 25 squares.

$$\frac{1}{4}\% = 0.25\%$$

$\frac{1}{4}$  % can be written as a decimal.

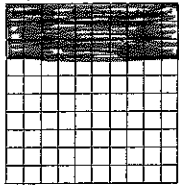
$$\frac{1}{4}\% = \frac{0.25}{100} = \frac{25}{10\,000} = 0.0025$$



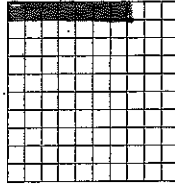
### Practice

1. Each hundred chart represents 100%. Shade the chart to represent the given percent.

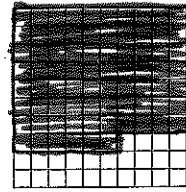
a) 30%



b) 7%



c) 86%



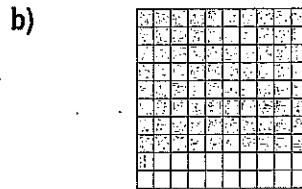
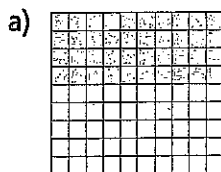
2. Write each percent as a fraction and as a decimal.

a)  $6\% = \frac{6}{100} = 0.06$

b)  $87\% = \frac{87}{100} = 0.87$

c)  $48\% = \frac{48}{100} = 0.48$

3. Each hundred chart represents 100%. What fraction is shaded? Write each fraction as a decimal and as a percent.



$$42.25\% = \frac{4225}{10000} = 42.25\% = 0.4225$$

$$\frac{91.5}{100} = \frac{915}{1000} = 91.5\% = 0.915$$

4. Write each percent as a fraction and as a decimal.

a)  $48.5\% = \frac{485}{1000} = 48.5\% \rightarrow 0.485$

b)  $10.75\% = \frac{1075}{10000} = 10.75\% \rightarrow 0.1075$

2. Find the number in each case.

Ignore!

a) 6% of a number is 9.

$$6\% = 9$$

$$1\% = \underline{\hspace{2cm}}$$

$$100\% = \underline{\hspace{2cm}}$$

b) 28% of a number is 56.

$$28\% = \underline{56}$$

$$1\% = \underline{\hspace{2cm}}$$

$$100\% = \underline{\hspace{2cm}}$$

c) 150% of a number is 36.

$$150\% = \underline{36}$$

$$1\% = \underline{\hspace{2cm}}$$

$$100\% = \underline{\hspace{2cm}}$$

3. Write each increase as a percent. Illustrate each answer on a number line.

a) The width of the rectangle increased from 8 cm to 12 cm.

$$\text{Increase} = 12 \text{ cm} - 8 \text{ cm} = \underline{\hspace{2cm}}$$

$$\text{Increase as a fraction of the original} = \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$$

$$\text{Percent increase} = \underline{\hspace{2cm}} \times 100\% = \underline{\hspace{2cm}}$$

b) The price of a hotel room increased from \$90.00 to \$120.00.

$$\text{Percent increase} = \underline{\hspace{2cm}}$$

4. Write each decrease as a percent. Illustrate each answer on a number line.

a) The volume of water in the tank decreased from 40 L to 32 L.

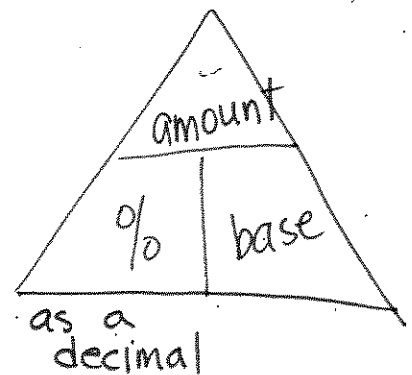
$$\text{Decrease} = 40 \text{ L} - 32 \text{ L} = \underline{\hspace{2cm}}$$

$$\text{Decrease as a fraction of the original} = \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$$

$$\text{Percent decrease} = \underline{\hspace{2cm}} \times 100\% = \underline{\hspace{2cm}}$$

b) The number of students in the class decreased from 30 to 27.

$$\text{Percent decrease} = \underline{\hspace{2cm}}$$



5. In a batch of eggs, 3% were broken. There were 18 broken eggs.

How many eggs were there in the batch?

base?

$$\text{base} = \frac{\text{amount}}{\% \text{ (dec)}} = \frac{18}{0.03}$$

$$= 600 \text{ eggs}$$

**Tip**  
Identify which number represents 1 whole, or 100%.

4. Calculate the discount, sale price before taxes, and sale price including 13% total tax.

a) \$28.95 book at 10% off

Discount: \$ 2.90

Sale price: \$26.05

13% tax: \$ 3.39

Total cost: \$ 29.44

b) \$239 coat at 25% off

Discount: \$ 59.75

Sale price: \$ 179.25

13% tax: \$ 23.30

Total cost: \$ 202.55

5. The cost of a ticket for a CFL game 3 years ago was \$36.00. The cost of the ticket has increased by 25%. Calculate the new cost of the ticket.

Increase in price:  $36 \times 0.25 = \$ 9$  Total cost:  $\$ 36 + \$ 9 = \$ 45$

6. Store A offers successive discounts of 10% one week and 20% the second week. Store B offers a one-time discount of 25% the second week.

Which store offers the greater discount? Store B

Store A

$\$ 10 \times 0.9 = \$ 9$

$\$ 9 \times 0.8 = \$ 7.20$

Store (A) offers the greater discount.

$\$ 10 \times 0.75 = \$ 7.50$

7. At a discount of 25%, skateboards are on sale for \$135.

What is the original price?

$\frac{\$ 135}{0.75} = \$ 180$

The original price is 0.75.

**HINT**

To find 100%, first find 1%.



8. A TV set, regularly priced at \$256, is offered for sale at 25% off. Sales tax is 15%.

a) Calculate the sale price at a 25% discount and then add 15% sales tax to it.

$\$ 256 \times 0.75 = \$ 192 \times 1.15 = \$ 220.80$

b) Add 15% tax to the original price and then calculate the sale price at a 25% discount.

Which calculation results in the greater discount? \_\_\_\_\_

9. The sales tax in Ontario is 13%.

Janis pays a total of \$32.77 for a fishing pole.

Find the cost of the fishing pole before sales tax.

$\frac{\$ 32.77}{1.13} = \$ 29$

**HINT**

The cost is 100%.



6. The prices for a day pass for skiing are:

Low Season: \$52

High Season: \$64

Spring Season: \$58

a) Write the increase in cost from Low Season to High Season. \_\_\_\_\_  
Illustrate the percent increase on a number line.

b) Write the decrease in cost from High Season to Spring Season. \_\_\_\_\_  
Illustrate the percent decrease on a number line.

7. a) The rural population of Quebec is about 1 650 000.

This represents 22% of the population of Quebec. Estimate the population of Quebec.

$$\frac{1\,650\,000}{0.22} = 7\,500\,000 \text{ ppl}$$

b) The population of Yukon Territory is about 31 400. Of these, 18 840 live in urban areas.  
What percent of the population of Yukon Territory lives in rural areas?

$$31\,400 - 18\,840 = 12\,560 \quad \frac{12\,560}{31\,400} \times 100\% = 40\%$$

8. A fish tank contains 24 L of water. Water is added to increase the volume by 12.5%.  
What is the new volume of water in the tank?

$$24 \times 1.125 = 27 \text{ L}$$

9. Thirty-six percent of a number is 63. Find 124% of the number.

$$\text{base} = \frac{63}{0.36} = 175 \times 1.24 = 217$$

10. A factory produces 900 items per week at a unit cost of \$75. New equipment is installed that increases the productivity by 12% and reduces the unit cost by 16%.

a) What is the new production rate?

$$900 \times 1.12 = 1008$$

b) What is the new unit cost?

$$\$75 \times 0.84 = \$63$$

$$100 - 16 = 84$$

### KEY TO SUCCESS

Problems can always be solved in more than one way. If you cannot solve a problem by one method, look at the problem from another view for an alternative method.