# Percentages

Watch this video on YouTube: https://www.youtube.com/watch?v=68kyJefaARc

**Ex A. Work out the missing percentages in these problems.**

**See if you can spot the impossible problem which cannot be answered!**

1) In a class, ¾ of the children are girls. What percentage are boys?

2) In a packet of skittles, 27% are red and 14% are blue. What percentage are not red?

3) In a group of 50 children, 11 cannot swim. What percentage are non-swimmers?

4) Frazer scores $^{27}/_{50}$ in a spelling test. What percentage did he get right?

5) Toronto FC have won half of their games and lost 42% of their games. What percentage have they tied?

6) Children had to pick their favourite sport from basketball, football and hockey. 35% chose basketball and ¼ chose hockey. What percentage chose football?

7) 38% of the animals in a dog and cat rescue centre are cats. What percentage are dogs?

8) In a math test, 32% of the children scored an average score. What percentage scored above average?

9) In a study of students under 25 years old, one-fifth have not yet learned to drive. What percentage can drive?

10) In a survey of 100 people, 6 people did not know how to ride a bike. What percentage could ride?

Did you manage to find the impossible problem?

**Ex B. Calculate the Percentages**

| | |
|---|---|
| a) 40% of 60 | b) 10% of 60 |
| c) 70% of 70 | d) 70% of 100 |
| e) 90% of 10 | f) 60% of 60 |
| g) 20% of 40 | h) 30% of 50 |
| i) 80% of 120 | j) 40% of 90 |
| k) 50% of 60 | l) 20% of 70 |
| m) 25% of 36 | n) 45% of 60 |
| o) 75% of 24 | p) 12% of 150 |

**Ex C. Solve these problems**

1. There are **1250 students** in a school.
   During the students' council elections they vote as follows:


- **10%** vote for **Tom**
- $\frac{2}{5}$ vote for **Sue**
- **20%** vote for **Pete**
- **the rest** vote for **Ann**

a. How many votes does **Sue get**?

_____ **votes**

b. How many votes does **Sue get more than Tom**?

_____ **votes**

c. What **percentage** of all the votes does **Ann** get?

_____ **%**

d. Who **wins** this election?
   **Tick** (✓) the correct answer.

☐ **Tom** ☐ **Sue** ☐ **Pete** ☐ **Ann**

2. My new cell phone cost me **€190** but when I signed a 2-year plan, I got **20% off**.

a) Find the discount.

b) How much did I pay for my new cell phone?

3. Look at the cards below. Choose the correct cards to complete the table.
Note: There are some extra cards.

| | | | | | |
|---|---|---|---|---|---|
| ~~$\frac{1}{4}$~~ | ~~0·04~~ | 50% | $\frac{3}{4}$ | ~~0·5~~ | $\frac{1}{5}$ |
| $\frac{4}{100}$ | 25% | 0·25 | 4% | ~~20%~~ | 0·2 |
| 0·75 | 0·4 | ~~75%~~ | $\frac{1}{2}$ | 30% | 1·4 |

| | decimal numbers | | fractions | | percentages |
|---|---|---|---|---|---|
| a. | 0·5 | = | | = | |
| b. | | = | | = | 20% |
| c. | | = | | = | 75% |
| d. | | = | $\frac{1}{4}$ | = | |
| e. | 0·04 | = | | = | |

# Percentages Answer Sheet

**Ex A. Work out the missing percentages in these problems.**

**See if you can spot the impossible problem which cannot be answered!**

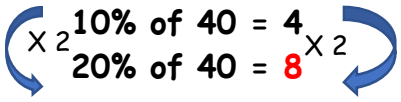
| Problem | Working |
|---|---|
| 1) In a class, ¾ of the children are girls. What percentage are boys? | x 25<br>$\frac{3}{4} = \frac{75}{100}$ = 75% girls<br>x 25<br>25% are boys |
| 2) In a packet of skittles, 27% are red and 14% are blue. What percentage are not red? | 100% -27% = 73% |
| 3) In a group of 50 children, 11 cannot swim. What percentage are non-swimmers? | x 2<br>$\frac{11}{50} = \frac{22}{100}$ = 22% non-<br>x 2<br>swimmers |
| 4) Frazer scores $^{27}/_{50}$ in a spelling test. What percentage did he get right? | x 2<br>$\frac{27}{50} = \frac{54}{100}$ = 54%<br>x 2 |
| 5) Toronto FC have won half of their games and lost 42% of their games. What percentage have they tied? | 50% (won)+ 42% (lost) = 92%<br>100% - 92% = 8% |
| 6) Children had to pick their favourite sport from basketball, football and hockey. 35% chose basketball and ¼ chose hockey. What percentage chose football? | x 25<br>$\frac{1}{4} = \frac{25}{100}$ = 25% hockey<br>x 25<br>35% + 25% = 60%<br>100% - 60% = 40% |

| | |
|---|---|
| 38% of the animals in a dog and cat rescue centre are cats. What percentage are dogs?  | 100% - 38% = 62% are dogs |
| 8) In a math test, 32% of the children scored an average score. What percentage scored above average? | Impossible question- we do not know the percentage of those who scored below average. |
| 9) In a study of students under 25 years old, one-fifth have not yet learned to drive. What percentage can drive? | $\frac{1}{5} = \frac{20}{100} = 20\%$ cannot drive (×20 / ×20)<br>100% - 20% = 80% can drive |
| 10) In a survey of 100 people, 6 people did not know how to ride a bike. What percentage could ride? | $\frac{6}{100}$ = 6% do not know how to ride a bike.<br>100% - 6% = 94% could ride |

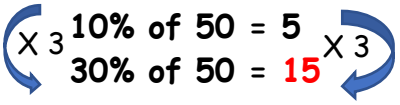
**Ex B. Calculate the Percentages**

| | |
|---|---|
| a) 40% of 60<br>**10% of 60 = 6**<br>**40% of 60 = 24** (×4 / ×4) | b) 10% of 60<br>**10% of 60 = 6** |
| c) 70% of 70<br>**10% of 70 = 7**<br>**70% of 70 = 49** (×7 / ×7) | d) 70% of 100<br>**10% of 100 = 10**<br>**70% of 100 = 70** (×7 / ×7) |
| e) 90% of 10<br>**10% of 10 = 1**<br>**90% of 10 = 9** (×9 / ×9) | f) 60% of 60<br>**10% of 60 = 6**<br>**60% of 60 = 36** (×6 / ×6) |

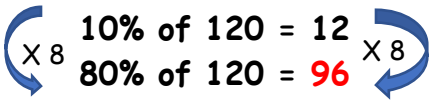
g) 20% of 40



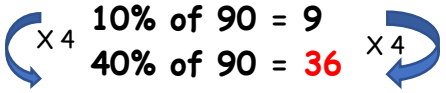

h) 30% of 50



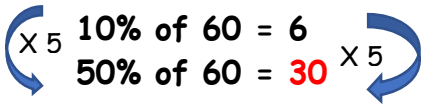

i) 80% of 120



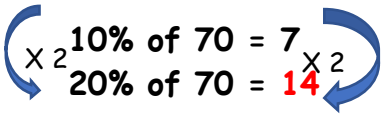

j) 40% of 90




k) 50% of 60




l) 20% of 70




m) 25% of 36

$\frac{25}{100} = \frac{1}{4}$

$\frac{1}{4}$ of $36 = 9$

n) 45% of 60

$\frac{45}{100} = \frac{9}{20}$

$\frac{9}{20}$ of $60 = 27$

o) 75% of 24

$\frac{75}{100} = \frac{3}{4}$

$\frac{3}{4}$ of $24 = 18$

p) 12% of 150

$\frac{12}{100} = \frac{3}{25}$

$\frac{3}{25}$ of $150 = 18$

**Ex C. Solve these problems**

1. There are **1250 students** in a school.
During the students' council elections they vote as follows:

- **10%** vote for **Tom**
- $\frac{2}{5}$ vote for **Sue**
- **20%** vote for **Pete**
- **the rest** vote for **Ann**

10 % of 1250 = 125 votes

$\frac{2}{5}$ of 1250 = 500 votes

10 % of 1250 = 125
20% of 1250 = 250 votes


a. How many votes does **Sue get?**

$\frac{2}{5}$ of 1250 = 500 votes

500 votes

b. How many votes does **Sue get more than Tom?**

500 – 125 =375 votes

375 votes

c. What **percentage** of all the votes does **Ann** get?

$\frac{2(x20)}{5(x\ 20)} = \frac{40}{100}$ =40%

10% + 20% + 40% = 70%

100% - 70% = 30%

30 %

d. Who **wins** this election?
**Tick** (✓) the correct answer.

☐ Tom ☑ Sue ☐ Pete ☐ Ann

2. My new cell phone cost me **€190** but when I signed a 2-year plan, I got **20% off**.

a) Find the discount.
10% of **€190** = **€19**
20% of **€190** = **€38 is the discount**

b) How much did I pay for my new cell phone?

**€190 - €38** = **€152 is the new price of my cell phone**

Look at the cards below. Choose the correct cards to complete the table.
Note: There are some extra cards.

| | | | | | |
|---|---|---|---|---|---|
| ~~$\frac{1}{4}$~~ | ~~0·04~~ | 50% | $\frac{3}{4}$ | ~~0·5~~ | $\frac{1}{5}$ |
| $\frac{4}{100}$ | 25% | 0·25 | 4% | ~~20%~~ | 0·2 |
| 0·75 | 0·4 | ~~75%~~ | $\frac{1}{2}$ | 30% | 1·4 |

| | decimal numbers | | fractions | | percentages |
|---|---|---|---|---|---|
| a. | 0·5 | = | $\frac{1}{2}$ | = | 50 % |
| b. | 0.2 | = | $\frac{1}{5}$ | = | 20% |
| c. | 0.75 | = | $\frac{3}{4}$ | = | 75% |
| d. | 0.25 | = | $\frac{1}{4}$ | = | 25 % |
| e. | 0·04 | = | $\frac{4}{100}$ | = | 4 % |