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# Operations with Numbers in Scientific Notation

The illustration shows a fox and a town. The fox is labeled "95 foxes". The town is labeled " $3.8 \times 10^2 \text{ m}^2$ ". To the right, the following mathematical conversions are shown:

$$\begin{aligned} 95 &= 9.5 \times 10^1 \\ &= \frac{9.5}{3.8} \times 10^{-1} \\ &= 2.5 \times 10^{-1} \end{aligned}$$

- 1 Decide which numbers are written in scientific notation.
- 2 Calculate the fox population of Mr. and Mrs. Fox's village.
- 3 Find the fox density of the town.
- 4 Determine the fox population in Norway.
- 5 Examine the different population densities.
- 6 Complete the following operations using scientific notation.
- + with lots of tips, answer keys, and detailed answer explanations for all of the problems.



The complete package, including all problems, hints, answers, and detailed answer explanations is available for all [sofatutor.com](https://www.sofatutor.com) subscribers.



## Decide which numbers are written in scientific notation.

Choose the correct notation.

A number written in scientific notation looks like

$$n \times 10^a,$$

with the coefficient  $n$ , where  $n$  has to be greater than or equal to 1 and less than 10, base 10 and exponent  $a$ .

**A**

$$7.5 \times 10^2$$

**B**

$$75.0 \times 10$$

**C**

$$24$$

**D**

$$2.4 \times 10^1$$

**E**

$$95$$

**F**

$$3.2 \times 10^2$$



## Hints for solving these problems

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### Decide which numbers are written in scientific notation.

#### Hint #1

Keep the definition of scientific notation above in mind.

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#### Hint #2

The number 2016 written in scientific notation is

$$2016 = 2.016 \times 10^3.$$

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## Answers and detailed answer explanations for these problems

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### Decide which numbers are written in scientific notation.

**Answer key:** A, D, F

The fox density is given by 750 foxes / mi<sup>2</sup>.

To write 750, or 750.0, in scientific notation, we move the decimal place over two to the left to get  $750 = 7.5 \times 10^2$ .

Remember that we do this as  $n$  must be greater than or equal to 1 and less than 10.

The area of of the village,  $3.8 \times 10^3$ , is already given in scientific notation.

We can also write  $7.5 \times 3.8 = 24$  in scientific notation:  $24 = 2.4 \times 10^1$ .