CHAPTER 7

The Decimal Notation For Fractions

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CONTENTS

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1 OTHER SYMBOLS FOR TENTHS AND HUNDREDTHS

In this chapter you will learn more about decimal fractions and how they relate to common fractions and percentages. You will also learn to order and compare decimal fractions, and how to calculate with decimal fractions.

1.1   Tenths and Hundredths again

> **Note**
>
> $0,1$ is another way to write $\frac{1}{10}$ and
> $0,01$ is another way to write $\frac{1}{100}$.
> $0,1$ and $\frac{1}{10}$ are different notations for the same number.
> $\frac{1}{10}$ is called the **(common) fraction notation**
> and $0,1$ is called the **decimal notation**. The same quantity can be expressed in different ways in tenths and hundredths.
>
> For example, *3 tenths and 17 hundredths can be expressed as 2 tenths and 27 hundredths or 4 tenths and 7 hundredths.*
>
> All over the world, people have agreed to keep the number of hundredths in such statements below 10. This means that the normal way of expressing the above quantity is *4 tenths and 7 hundredths.*
>
> **Written in decimal notation, 4 tenths and 7 hundredths is 0,47**. This is read as *nought comma four seven* and NOT *nought comma forty-seven*.

1.2   and thousandths

> **Note**
>
> $0,001$ is another way of writing $\frac{1}{1000}$.

2 PERCENTAGES AND DECIMAL FRACTIONS

2.1 Hundredths, percentages and decimals ...

> **Note**
>
> - Instead of *6 hundredths*, you may say *6 per cent*. It means the same.
>
> - We do not say: "How many per cent of the rectangle is green?" We say: "What percentage of the rectangle is green?"
>
> - The symbol % is used for "per cent".
>
> - Instead of writing "17 per cent", you may write 17%.
>
> - *Per cent* means *hundredths*. The symbol % is a bit like the symbol $\frac{}{100}$.
>
> - $0,37$ and 37% and $\frac{37}{100}$ are different symbols for the same thing: 37 *hundredths*.

3 DECIMAL CONCEPTS

3.1 Decimal jumps

> **Note**
>
> A calculator can be programmed to do the same operation over and over again.
>
> For example, press $0,1$ $\boxed{+}$ $\boxed{=}$ (do not press CLEAR or any other operation). Press the $\boxed{=}$ key repeatedly and see what happens. The calculator counts in $0,1$s.

3.2 Place value

We can write $3,784$ in expanded notation as $3,784 = 3 + 0,7 + 0,08 + 0,004$. We can also name these parts as follows:

- the 3 represents the **units**

- the 7 represents the **tenths**

- the 8 represents the **hundredths**

- the 4 represents the **thousandths**

4 ROUNDING OFF

Just as whole numbers can be rounded off to the nearest 10, 100 or $1\,000$, decimal fractions can be rounded off to the nearest whole number, or to one, two, three etc. digits after the comma.

A decimal fraction is rounded off to the number whose value is closest to it. Therefore $13,24$ rounded off to one decimal place is $13,2$ and $13,26$ rounded off to one decimal place is $13,3$.

A decimal ending in a 5 is an equal distance from the two numbers to which it can be rounded off. Such decimals are rounded off to the biggest number, so $13,15$ rounded off to one decimal place becomes $13,2$.

5 ADDITION AND SUBTRACTION WITH DECIMAL FRACTIONS

5.1 Mental calculations

> **Note**
>
> When you add or subtract decimal fractions, you can change them to common fractions to make the calculation easier.
>
> $$0,4 + 0,5$$
> $$= \frac{4}{10} + \frac{5}{10}$$
> $$= \frac{9}{10}$$
> $$= 0,9$$

6 MULTIPLICATION AND DECIMAL FRACTIONS

6.1 The power of ten

What does multiplying a decimal number with a whole number mean?

What does something like $4 \times 0,5$ mean?

What does something like $0,5 \times 4$ mean?

$4 \times 0,5$ means 4 groups of $\frac{1}{2}$, which is $\frac{1}{2} + \frac{1}{2} + \frac{1}{2} + \frac{1}{2}$, which is 2.

$0,5 \times 4$ means $\frac{1}{2}$ of 4, which is 2.

A real-life example where we would find this is:

$$6 \times 0,42 \text{ kg} = 6 \times \frac{42}{100}$$
$$= (6 \times 42) \div 100$$
$$= 252 \div 100$$
$$= 2,52 \text{ kg}$$

What really happens is that we convert $6 \times 0,42$ to the product of two whole numbers, do the calculation and then convert the answer to a decimal fraction again $(\div 100)$.

6.2   Multiplying decimals with whole numbers

What does multiplying a decimal with a decimal mean?

For example, what does $0,32 \times 0,87$ mean?

If you buy $0,32$ m of ribbon and each metre costs $R0,87$, you can write it as $0,32 \times 0,87$.

$$
\begin{aligned}
0,32 \times 0,87 &= \frac{32}{100} \times \frac{87}{100} &&\text{[Write as common fractions]} \\
&= \frac{32 \times 87}{10000} &&\text{[Multiplication of two fractions]} \\
&= \frac{2784}{10000} &&\text{[The product of the whole numbers } 32 \times 87] \\
&= 0,2784 &&\text{[Convert to a decimal by dividing the product by } 10\,000]
\end{aligned}
$$

The product of two decimals is thus converted to the product of whole numbers and then converted back to a decimal.

The product of two decimals and the product of two whole numbers with the same digits differ only in terms of the place value of the products, in other words the position of the decimal comma. It can also be determined by estimating and checking.

6.3   Multiplying decimals with decimals

The following method can also be used to multiply decimals with decimals:

$$
\begin{aligned}
0,84 \times 0,6 &= (84 \div 100) \times (6 \div 10) \\
&= (84 \times 6) \div (100 \times 10) \\
&= 504 \div 1000 \\
&= 0,504
\end{aligned}
$$

7 DIVISION AND DECIMAL FRACTIONS

Look carefully at the following three methods of calculation:

1. $0,6 \div 2 = 0,3$ [6 tenths $\div 2 = 3$ tenths]

2.

$$12,4 \div 4 = 3,1 \qquad\qquad [(12 \text{ units} + 4 \text{ tenths}) \div 4]$$
$$= (12 \text{ units } \div 4) + (4 \text{ tenths } \div 4)$$
$$= 3 \text{ units } + 1 \text{ tenth}$$
$$= 3,1$$

3.

$$2,8 \div 5 = 28 \text{ tenths} \div 5$$
$$= 25 \text{ tenths} \div 5 \text{ and } 3 \text{ tenths} \div 5$$
$$= 5 \text{ tenths and } (3 \text{ tenths} \div 5) \qquad [3 \text{ tenths cannot be divided by } 5]$$
$$= 5 \text{ tenths and } (30 \text{ hundredths} \div 5) \qquad [3 \text{ tenths} = 30 \text{ hundredths}]$$
$$= 5 \text{ tenths and } 6 \text{ hundredths}$$
$$= 0,56$$

8 EXERCISES

1. 1.1 What part of the rectangle below is coloured yellow?

   1.2 What part of the rectangle is red?

   1.3 What part of the rectangle is blue?

   1.4 What part of the rectangle is green?

   1.5 What part of the rectangle is not coloured?

2. .

   2.1 What part of the rectangle is coloured yellow? Give your answer in decimal notation.

   2.2 What part of the rectangle is red? Give your answer in decimal notation.

3. Three tenths and seven hundredths of a rectangle is coloured red, and two tenths and six hundredths of the rectangle is coloured brown. What part of the rectangle is not coloured? Give your answer in fraction notation and in decimal notation.

4. On Monday, Steve ate three tenths and seven hundredths of a strip of licorice. On Tuesday, Steve ate two tenths and five hundredths of a strip of licorice. How much licorice did he eat on Monday and Tuesday together? Give your answer in fraction and decimal notation.

5. The correct answer for the previous question is $(\frac{62}{100})$ or 0.62. Lebogang's answer is five tenths and 12 hundredths. Susan's answer is six tenths and two hundredths. Who is right, or are they both wrong?

6. What is the decimal notation for each of the following numbers?

   6.1 $3\frac{7}{10}$

   6.2 $4\frac{19}{100}$

   6.3 $\frac{47}{10}$

   6.4 $\frac{4}{100}$

8.2 Exercise 2

1. What is the decimal notation for each of the following?

   1.1 $\frac{7}{1000}$

   1.2 $\frac{9}{1000}$

   1.3 $\frac{147}{1000}$

   1.4 $\frac{999}{1000}$

2. Write the following numbers in decimal notation:

   2.1 $2 + \frac{3}{10} + \frac{7}{100} + \frac{4}{1000}$

   2.2 $12 + \frac{1}{10} + \frac{4}{1000}$

   2.3 $2 + \frac{4}{1000}$

   2.4 $67\frac{123}{1000}$

   2.5 $34\frac{61}{1000}$

   2.6 $654\frac{3}{1000}$

8.3 Exercise 3

1.

   1.1 How many small parts are there in the rectangle? And in one tenth of the rectangle?

   1.2 What part of the rectangle is blue and what part is green?

2. .

   2.1 What percentage of the rectangle is green?

   2.2 What percentage of the rectangle is red?

3. .

3.1 What percentage of the rectangle is blue?

3.2 What percentage of the rectangle is white?

4. 4.1 How much is 1% of R 400?

    4.2 How much is 37% of R 400?

    4.3 How much is 37% of R 700?

5. 5.1 25 apples are shared equally between 100 people. What fraction of the apple does each person get?

    5.2 How much is 1% of 25?

    5.3 How much is 8% of 25?

    5.4 How much is 8% of 50?

6. 6.1 Express the following in three ways: three tenths

    6.2 Express the following in three ways: seven hundredths

    6.3 Express the following in three ways: 37 hundredths

    6.4 Express the following in three ways: seven tenths

    6.5 Express the following in three ways: three quarters

    6.6 Express the following in three ways: seven eighths

7. 7.1 How much is three tenths of R 200 and seven hundredths of R 200 altogether?

    7.2 How much is $\frac{37}{100}$ of R 200?

    7.3 How much is $0,37$ of R 200?

    7.4 How much is 37% of R 200?

8. 8.1 Express the following in three ways: 20 hundredths

    8.2 Express the following in three ways: 50 hundredths

    8.3 Express the following in three ways: 25 hundredths

    8.4 Express the following in three ways: 75 hundredths

9. 9.1 Jan eats a quarter of a watermelon. What percentage of the watermelon is this?

    9.2 Sibu drinks 75% of the milk in a bottle. What fraction of the milk is this?

    9.3 Jeminah uses $0,75$ of the paint in a tin. What percentage of the paint does she use?

10. The floor of a large room is shown
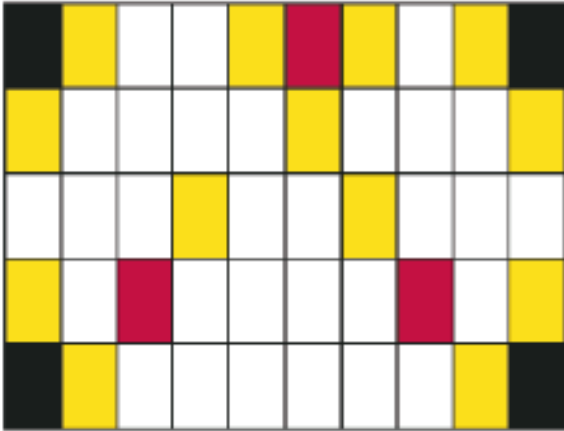
10.1 What part of the floor is covered in white?

10.2 What part of the floor is covered in red?

10.3 What part of the floor is covered in yellow?

10.4 What part of the floor is covered in black?

8.4 Exercise 4

1. Give the lengths of the marked points (A to D) for the number line.
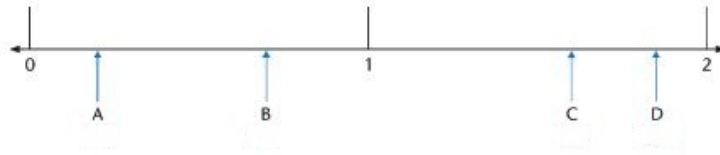
2. Give the lengths of the marked points (A to D) for the number line.
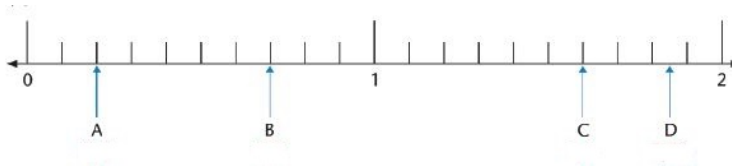
3. Give the lengths of the marked points (A to D) for the number line.
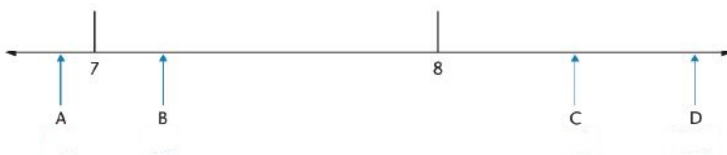
4. Give the lengths of the marked points (A to D) for the number line.
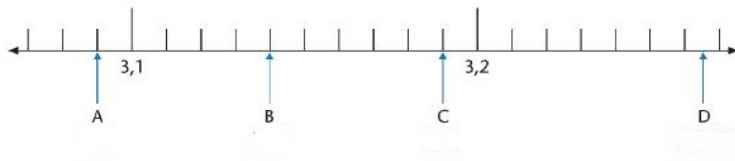
5. Give the lengths of the marked points (A to D) for the number line.
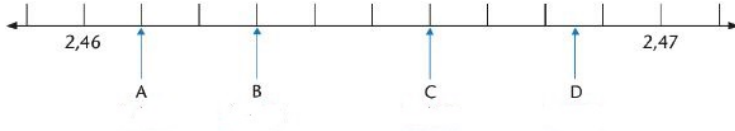
6. Give the lengths of the marked points (A to D) for the number line.
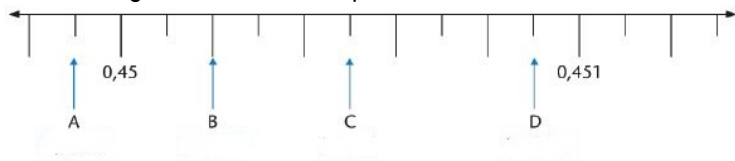
7. Give the lengths of the marked points (A to D) for the number line.
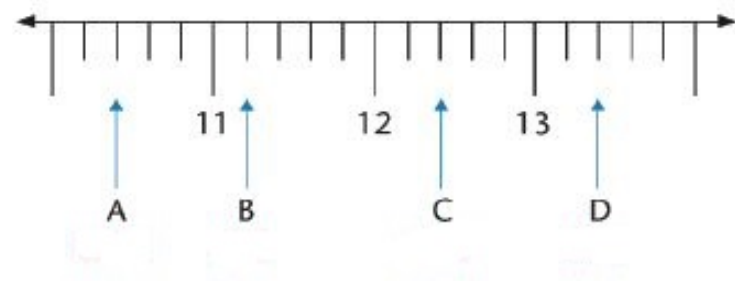
8.5 Exercise 5

1. 1.1 Write the next ten numbers in the number sequence and show your number sequence on a number line.

   $0, 2; 0, 4; 0, 6; \ldots$

   1.2 How many $0, 2$s are there in 1?

   1.3 Write $0, 2$ as a common fraction?

2. 2.1 Write the next ten numbers in the number sequence and show your number sequence on a number line.

   $0, 3; 0, 6; 0, 9; \ldots$

   2.2 How many $0, 3$s are there in 3?

2.3 Write $0,3$ as a common fraction.

3. 3.1 Write the next ten numbers in the number sequence and show your number sequence on a number line.

$0,25; 0,5; \ldots$

3.2 How many $0,25$s are there in 1?

3.3 Write $0,25$ as a common fraction.

4. 4.1 Write down the next five numbers of the number sequence.

$9,3; 9,2; 9,1; \ldots$

4.2 Write down the next five numbers of the number sequence.

$0,15; 0,14; 0,13; 0,12; \ldots$

8.6 Exercise 6

1. 1.1 Write the following as one number:

$2 + 0,5 + 0,07$

1.2 Write the following as one number:

$2 + 0,5 + 0,007$

1.3 Write the following as one number:

$2 + 0,05 + 0,007$

1.4 Write the following as one number:

$5 + 0,4 + 0,03 + 0,001$

1.5 Write the following as one number:

$5 + 0,04 + 0,003 + 0,1$

1.6 Write the following as one number:

$5 + 0,004 + 0,3 + 0,01$

8.7 Exercise 7

1. Order the following numbers from biggest to smallest.

$0,8; 0,05; 0,5; 0,15; 0,465; ,55; 0,75; 0,4; 0,62$

2. 2.1 Below are the results of some of the 2012 London Olympic events. Order the results from first to last place.

Name	Country	Distance	Place
Anna Nazarova	RUS	6,77 m	
Brittney Reese	USA	7,12 m	
Elena Sokolova	RUS	7,07 m	
Ineta Radevica	LAT	6,88 m	
Janay DeLoach	USA	6,89 m	3rd
Lyudmila Kolchanova	RUS	6,76 m	

2.2 Below are the results of some of the 2012 London Olympic events. Order the results from first to last place.

Name	Country	Time	Place
Georganne Moline	USA	53,92 s	
Kaliese Spencer	JAM	53,66 s	4th
Lashinda Demus	USA	52,77 s	
Natalya Antyukh	RUS	52,70 s	
T'erea Brown	USA	55,07 s	
Zuzana Hejnová	CZE	53,38 s	

2.3 Below are the results of some of the 2012 London Olympic events. Order the results from first to last place.

Name	Country	Time	Place
Aries Merritt	USA	12,92 s	
Hansle Parchment	JAM	13,12 s	
Jason Richardson	USA	13,04 s	
Lawrence Clarke	GBR	13,39 s	
Orlando Ortega	CUB	13,43 s	
Ryan Brathwaite	BAR	13,40 s	

2.4 Below are the results of some of the 2012 London Olympic events. Order the results from first to last place.

Name	Country	Distance	Place
Andreas Thorkildsen	NOR	82,63 m	
Antti Ruuskanen	FIN	84,12 m	
Keshorn Walcott	TRI	84,58 m	
Oleksandr Pyatnytsya	UKR	84,51 m	
Tero Pitkämäki	FIN	82,80 m	
Vítezslav Veselý	CZE	83,34 m	

3. 3.1 Give a number that falls between the two numbers.

$3, 5$ and $3, 7$

3.2 Give a number that falls between the two numbers.

$3, 9$ and $3, 11$

3.3 Give a number that falls between the two numbers.

$3, 1$ and $3, 2$

4. How many numbers are there between $3, 1$ and $3, 2$?

5. 5.1 Fill in $<, >$ or $=$.

$0, 4 \square 0, 52$

5.2 Fill in $<, >$ or $=$.

$0, 4 \square 0, 32$

5.3 Fill in $<, >$ or $=$.

$2, 61 \square 2, 7$

5.4 Fill in $<, >$ or $=$.

$2, 4 \square 2, 40$

5.5 Fill in $<, >$ or $=$.

$2, 34 \square 2, 567$

5.6 Fill in $<, >$ or $=$.

$2, 34 \square 2, 251$

8.8 Exercise 8

1. Round the following number off to the nearest whole number:

    1.1 $7,6$

    1.2 $18,3$

    1.3 $204,5$

    1.4 $1,89$

    1.5 $0,9$

    1.6 $34,7$

    1.7 $11,5$

    1.8 $0,65$

2. Round the following number off to one decimal place:

    2.1 $7,68$

    2.2 $18,93$

    2.3 $21,47$

    2.4 $0,643$

    2.5 $0,938$

    2.6 $1,44$

    2.7 $3,81$

3. Round the following number off to two decimal places:

    3.1 $3,432$

    3.2 $54,117$

    3.3 $4,809$

    3.4 $3,762$

    3.5 $4,258$

    3.6 $10,222$

    3.7 $9,365$

    3.8 $299,996$

8.9 Exercise 9

1. John and three of his brothers sell an old bicycle for R $44,65$. How can the brothers share the money fairly?

2. A man buys $3,75\ m$ of wood at R $11,99$ per metre. What does the wood cost him?

3. 3.1 Estimate the answer of the following by rounding off the numbers:
   $89,3 \times 3,8 =$

   3.2 Estimate the answer of the following by rounding off the numbers:
   $227,3 + 71,8 - 28,6 =$

8.10 Exercise 10

1. Complete the number chain.

| 34,123 | → | + 20 | → | 54,123 | → | | → | 454,123 | → | | → | 454,023 |

| 422,011 | ← | | ← | 452,011 | ← | | ← | 452,021 | ← | | ← | 452,023 |

| 222,011 | → | | → | 222,211 | → | | → | 222,231 | → | | → | 222,232 |

| 222,489 | ← | | ← | 222,482 | ← | | ← | 222,422 | ← | | ← | 222,222 |
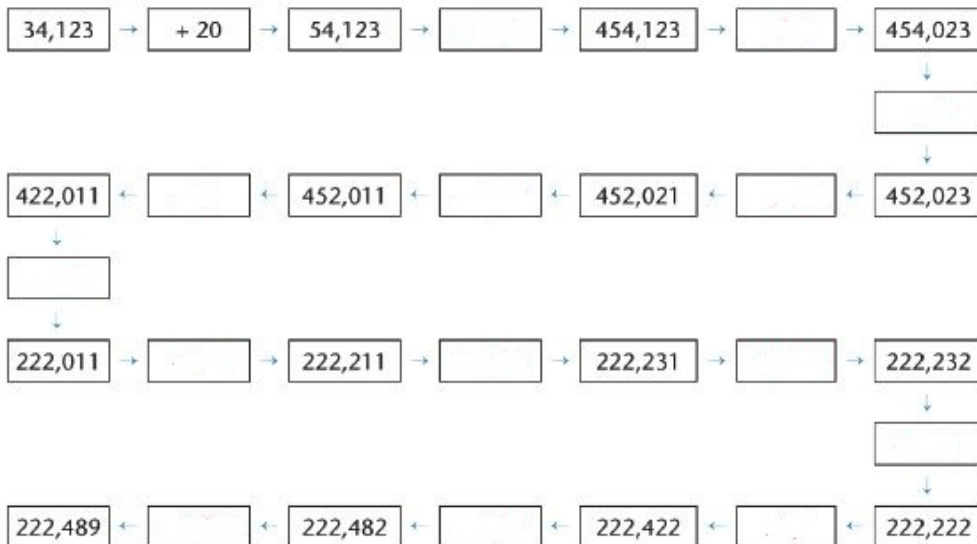
2. Calculate the following:

   2.1 $0,7 + 0,2$

   2.2 $0,7 + 0,4$

   2.3 $1,3 + 0,8$

   2.4 $1,35 + 0,8$

   2.5 $0.25 + 0,7$

   2.6 $0,25 + 0,07$

   2.7 $3 - 0,1$

   2.8 $3 - 0,01$

2.9 $2,4 - 0,5$

8.11   Exercise 11

1. The owner of an internet cafe looks at her bank statement at the end of the day. She finds the following amounts paid into her account: R $281,45$; $R39,81$; $R104,54$ and R $9,80$.
   How much money was paid into her account on that day?

2. At the beginning of a journey the odometer in a car reads: $21\,589,4$. At the end of the journey the odometer reads: $21\,763,7$.
   What distance was traveled?

3. At an athletics competition, an athlete runs the $100\,m$ race in $12,8$ seconds. The announcer says that the athlete has broken the previous record by $0,4$ seconds.
   What was the previous record?

4. In a surfing competition, five judges give each contestant a mark out of 10. The highest and the lowest marks are ignored and the other three marks are totalled. Work out each contestant's score and place the contestants in order from first to last.

   A: 7,5   8   7   8,5   7,7   B: 8,5   8,5   9,1   8,9   8,7
   C: 7,9   8,1   8,1   7,8   7,8   D: 8,9   8,7   9   9,3   9,1

5. A pipe is measured accurately. AC = 14,80 mm and AB = 13,97 mm. How thick is the pipe?
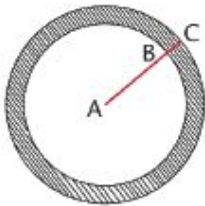
6. Mrs Mdlankomo buys three packets of mincemeat. The packets weigh $0,356\ kg$, $1,201\ kg$ and $0,978\ kg$ respectively. What do they weigh together?

8.12   Exercise 12

1. 1.1 Complete the multiplication table.

×	1 000	100	10	1	0,1	0,01	0,001
6	6 000		60			0,06	
6,4		640					
0,5					0,05		
4,78	4 780		47,8				
41,2	41 200						

1.2 Is it correct to say that "multiplication makes bigger"?

1.3 Calculate the following:

$0,5 \times 10$

1.4 Calculate the following:

$0,5 \times 100$

1.5 Calculate the following:

$0,42 \times 10$

1.6 Calculate the following:

$0,675 \times 100$

2. 2.1 Complete the division table.

÷	1	10	100	1 000
6	6	0,6	0,06	
6,4	6,4			
0,5			0,005	
4,78				
41,2				

2.2 Calculate the following:

$0,5 \div 10$

2.3 Calculate the following:

$0,3 \div 100$

2.4 Calculate the following:

$0,42 \div 10$

3. Complete the following statement:

   Multiplying with $0,1$ is the same as dividing by...

4. Fill in the missing numbers.

| 1,23456 | → | × 10 | → | 12,3456 | → | | → | 123,456 | → | | → | 12 345,6 |

↓

| | |

↓

| 1 234,56 | ← | | ← | 12 345,6 | ← | | ← | 123 456 | ← | | ← | 1 234 560 |

↓

| |

↓

| 123,456 | → | | → | 1,23456 | → | | → | 0,123456 | → | | → | 123 456 |
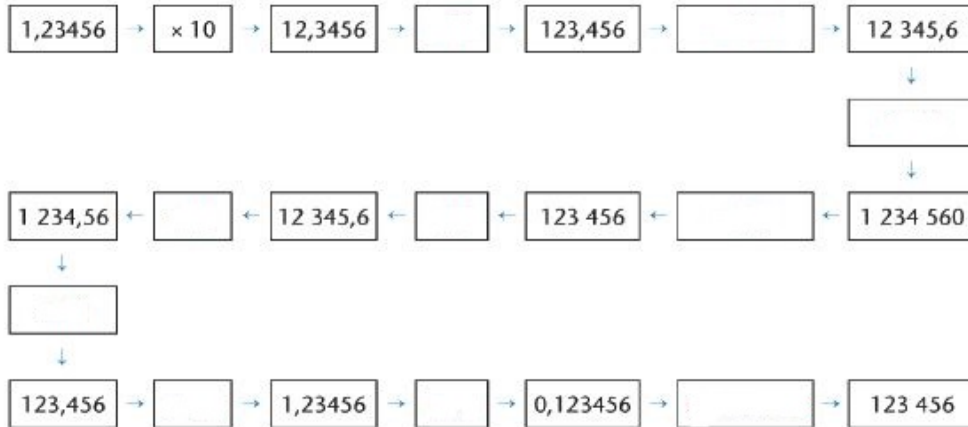
8.13   Exercise 13

1. Calculate the following. Use fraction notation to help you.

   1.1 0.3×7

   1.2 0.21×91

   1.3 $8 \times 0,4$

2. Estimate the answer to the following and then calculate:

   2.1 $0,4 \times 7$

   2.2 $0,55 \times 7$

   2.3 $12 \times 0,12$

   2.4 $0,601 \times 2$

8.14   Exercise 14

1. Calculate the following using fraction notation to help you:

   1. $0,6 \times 0,4$

   1. $0,06 \times 0,4$

   1. $0,06 \times 0,04$

2. Calculate the following:

    2.1 $0,4 \times 0,7$

    2.2 $0,4 \times 7$

    2.3 $0.04 \times 0.,7$

8.15   Exercise 15

1. Calculate the following:

    1.1 $8,4 \div 2$

    1.2 $3,4 \div 4$

2. Calculate the following:

    2.1 $0,08 \div 4$

    2.2 $14,4 \div 12$

    2.3 $8,4 \div 7$

    2.4 $4,5 \div 15$

    2.5 $1,655 \div 5$

    2.6 $0,225 \div 25$

3. A grocer buys $15 \ kg$ of bananas for R 99.90. What do the bananas cost per kilogram?

4. Given $26,8 \div 4 = 6,7$. Write down the answers to the following without calculating:

    4.1 $268 \div 4$

    4.2 $0.268 \div 4$

5. Given $128 \div 8 = 16$. Write down the answers to the following without calculating:

    5.1 $12,8 \div 8$

    5.2 $1,28 \div 8$

6. John buys $0,45 \ m$ of chain. The chain costs R 20 per metre. What does John pay for the chain?

7. Anna buys a packet of mincemeat. It weighs $0,215 \ kg$. The price for the mincemeat is R $42,95$ per kilogram. What does she pay for her packet of mincemeat?

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9 ANSWERS FOR EXERCISES

9.1 Exercise 1

1.1 10 hundredths or $\frac{10}{100}$ or 1 tenth or $\frac{1}{10}$

1.2 $\frac{1}{100}$

1.3 $\frac{30}{100}$ or $\frac{3}{10}$

1.4 $\frac{2}{100}$

1.5 $\frac{57}{100}$

2.1 $0,1$

2.2 $0,01$

3. 3 tenths ($\frac{3}{10}$) and 7 hundredths ($\frac{7}{100}$) is not coloured. That is ($\frac{37}{100}$) or $0,37$.

4. ($\frac{62}{100}$) or 0.62

5. They are both right.

6.1 $3,7$

6.2 $4,19$

6.3 $4,7$

6.4 $0,04$

9.2 Exercise 2

1.1 $0,007$

1.2 $0,009$

1.3 $0,147$

1.4 $0,999$

2.1 $2,374$

2.2 $12,04$

2.3 $2,004$

2.4 $67,123$

2.5 $34,061$

2.6 $654,003$

9.3   Exercise 3

1.1 100 small parts and 10 small parts in one tenth of the rectangle.

1.2 Blue: $\frac{30}{100}$ or $\frac{3}{10}$ Green: $\frac{2}{100}$ or $\frac{1}{50}$

2.1 2%

2.2 1%

3.1 30%

3.2 57%

4.1 R 4

4.2 R 148

4.3 R 259

5.1 $\frac{1}{4}$ or $\frac{25}{100}$

5.2 0.25 or $\frac{1}{4}$

5.3 2

5.4 4

6.1 $0,3; 30\%; \frac{30}{100}$

6.2 $0,07; 7\%; \frac{7}{100}$

6.3 $0,37; 37\%; \frac{37}{100}$

6.4 $0,7; 70\%; \frac{70}{100}$

6.5 $0,75; 75\%; \frac{75}{100}$

6.6 $0,875; 87,5\%; \frac{875}{1000}$

7.1 R $60 +$ R $14 = R74$

7.2 R 74

7.3 R 74

7.4 R 74

8.1 $0,2;20\%;\frac{20}{100}$

8.2 $0,5;50\%;\frac{50}{100}$

8.3 $0,25;25\%;\frac{25}{100}$

8.4 $0,75;75\%;\frac{75}{100}$

9.1 25%

9.2 $\frac{75}{100}$ or $\frac{3}{4}$

9.3 75%

10.1 $0,6;60\%;\frac{60}{100}$

10.2 $0,06;6\%;\frac{6}{100}$

10.3 $0,26;26\%;\frac{26}{100}$

10.4 $0,08;8\%;\frac{8}{100}$

9.4   Exercise 4

1.1 A= $0,2$
   B= $0,7$
   C= $1,6$
   D= $1,85$

1.2 A= $0,2$
   B= $0,7$
   C= $1,6$
   D= $1,85$

1.3 A= $6,9$
   B= $7,2$
   C= $8,4$
   D= $8,75$

1.4 A= $2,09$
   B= $31,4$
   C= $3,19$
   D= $3,265$

1.5 A= $2,461$

B= $2,463$

C= $2,466$

D= $2,4685$

1.6 A= $0,4499$

B= $0,4502$

C= $0,4505$

D= $0,4509$

1.7 A= $10,4$

B= $11,2$

C= $12,4$

D= $13,4$

9.5   Exercise 5

1.1 $0,8;1;1,2;1,4;1,6;1,8;2,0;2,2;2,4;2,6$

1.2 5

1.3 $\frac{1}{5}$

2.1 $1,2;1,5;1,8;2,1;2,4;2,7;3,0;3,3;3,6;3,9$

2.2 10

2.3 $\frac{3}{10}$

3.1 $0,75;1;1,25;1,50;1,75;2,0;2,25;2,50;2,75;3,0$

3.2 4

3.3 $\frac{1}{4}$

4.1 $9;8,9;8,8;8,7;8,6$

4.2 $0,11;0,1;0,09;0,08;0,07$

9.6   Exercise 6

1.1 $2,57$

1.2 $2,507$

1.3 $2,057$

1.4 $5,431$

1.5 $5,143$

1.6 $5,314$

9.7   Exercise 7

1. $0.8; 0.75; 0.62; 0.55; 0.5; 0.465; 0.4; 0.15; 0.05$

2.1

Name	Country	Distance	Place
Anna Nazarova	RUS	$6,77$ m	5th
Brittney Reese	USA	$7,12$ m	1st
Elena Sokolova	RUS	$7,07$ m	2nd
Ineta Radevica	LAT	$6,88$ m	4th
Janay DeLoach	USA	$6,89$ m	3rd
Lyudmila Kolchanova	RUS	$6,76$ m	6th

2.2

Name	Country	Time	Place
Georganne Moline	USA	$53,92$ s	5th
Kaliese Spencer	JAM	$53,66$ s	4 th
Lashinda Demus	USA	$52,77$ s	2nd
Natalya Antyukh	RUS	$52,70$ s	1st
T'erea Brown	USA	$55,07$ s	6th
Zuzana Hejnová	CZE	$53,38$ s	3rd

2.3

Name	Country	Time	Place
Aries Merritt	USA	$12,92$ s	1st
Hansle Parchment	JAM	$13,12$ s	3rd
Jason Richardson	USA	$13,04$ s	2nd
Lawrence Clarke	GBR	$13,39$ s	4th
Orlando Ortega	CUB	$13,43$ s	6th
Ryan Brathwaite	BAR	$13,40$ s	5th

2.4

Name	Country	Distance	Place
Andreas Thorkildsen	NOR	$82,63$ m	6th
Antti Ruuskanen	FIN	$84,12$ m	3rd
Keshorn Walcott	TRI	$84,58$ m	1st
Oleksandr Pyatnytsya	UKR	$84,51$ m	1st
Tero Pitkämäki	FIN	$82,80$ m	5th
Vitezslav Veselý	CZE	$83,34$ m	4th

3.1 $3, 6$

3.2 $3, 5$

3.3 $3, 15$

4. unlimited/infinite

5.1 $<$

5.2 $>$

5.3 $<$

5.4 $=$

5.5 $<$

5.6 $>$

9.8   Exercise 8

1.1 8

1.2 18

1.3 205

1.4 2

1.5 1

1.6 35

1.7 12

1.8 1

2.1 $7, 7$

2.2 $18, 9$

2.3 $21, 5$

2.4 $0, 6$

2.5 $0, 9$

2.6 $1, 4$

2.7 $3, 8$

3.1 $3, 43$

3.2 $54, 12$

3.3 $4, 81$

3.4 $3, 76$

3.5 $4, 26$

3.6 $10, 22$

3.7 $9, 37$

3.8 300

9.9   Exercise 9

1. R $44, 65 \div 4 = 11, 1625 \approx R11, 16$

2. $3, 75 \times 11, 99 = 44, 9625 \approx R44, 96$

3.1 $89 \times 4 = 356$

3.2 $227 + 72 - 29 = 270$

9.10   Exercise 10

1. $\boxed{34, 123} \rightarrow \boxed{+20} \rightarrow \boxed{54, 123} \rightarrow \boxed{+400} \rightarrow \boxed{454, 123} \rightarrow \boxed{-0, 01} \rightarrow \boxed{454, 023} \rightarrow \boxed{-2} \rightarrow \boxed{452, 023} \rightarrow$
$\boxed{-0, 001} \rightarrow \boxed{452, 021} \rightarrow \boxed{-0, 01} \rightarrow \boxed{452, 0111} \rightarrow \boxed{-30} \rightarrow \boxed{422, 011} \rightarrow \boxed{-200} \rightarrow \boxed{222, 011} \rightarrow \boxed{+0, 2}$
$\rightarrow \boxed{222, 211} \rightarrow \boxed{+0, 02} \rightarrow \boxed{222, 231} \rightarrow \boxed{+0, 001} \rightarrow \boxed{222, 232} \rightarrow \boxed{-0, 01} \rightarrow \boxed{222, 222} \rightarrow \boxed{+0, 2} \rightarrow$
$\boxed{222, 422} \rightarrow \boxed{-0, 06} \rightarrow \boxed{222, 482} \rightarrow \boxed{+0, 007} \xrightarrow{222,489}$

2.1 $0, 9$

2.2 $1, 1$

2.3 $2, 1$

2.4 $2, 15$

2.5 $0, 95$

2.6 $0,32$

2.7 $2,9$

2.8 $2,99$

2.9 $1,9$

9.11 Exercise 11

1. R $435,60$

2. $174,3\ km$

3. $13,2$ seconds

4. D; B; C; A
   Contestant A: $7,5 + 8 + 7,7 = 23,2$
   Contestant B: $8,5 + 8,9 + 8,7 = 26,1$
   Contestant C: $7,9 + 8,1 + 7,8 = 23,8$
   Contestant D: $8,9 + 9 + 9,1 = 27$

5. $14,80\ mm - 13,97\ mm = 0,83\ mm$

6. $2,535\ kg$

9.12 Exercise 12

1.1

$\times$	1000	100	10	1	0,1	0,01	0,001
6	6000	600	60	6	0,6	0,06	0,006
6,4	6400	640	64	6,4	0,64	0,064	0,064
0,5	500	50	5	0,5	0,05	0,005	0,0005
4,78	4780	478	47,8	4,78	0,478	0,0478	0,00478
41,2	41200	4120	412	41,2	4,12	0,412	0,0412

1.2 False, it is not correct; it is true only if you multiply with whole numbers. Multiply by $10; 100$ or $1\ 000$: the value of each digit in the number becomes $10, 100$ or $1\ 000$ times bigger and each digit thus moves one, two or three places to the left. Multiply by $0,1; 0,01$ or $0,001$: each digit moves one, two or three places to the right. The comma remains fixed. To multiply a number by $0,1$ is the same as dividing it by 10.
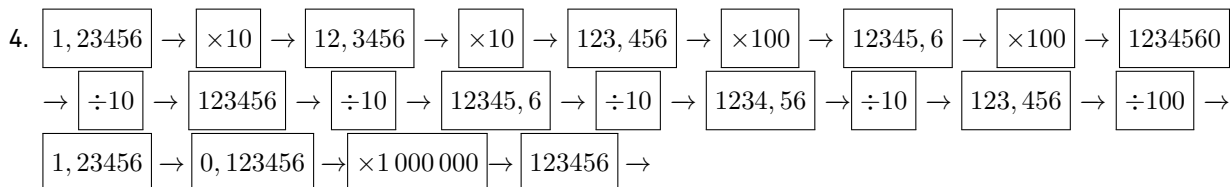
1.3 5

1.4 30

1.5 $4,2$

1.6 $67,5$

2.1

÷	1	10	100	1000
6	6	0,6	0,06	0,006
6,4	6,4	0,64	0,064	0,0064
0,5	0,5	0,05	0,005	0,005
4,78	4,78	0,478	0,0478	0,00478
41,2	41,2	4,12	0,412	0,0412

2.2 $0,05$

2.3 $0,003$

2.4 $0,042$

3. 10

4. $1,23456 \rightarrow \boxed{\times 10} \rightarrow 12,3456 \rightarrow \boxed{\times 10} \rightarrow 123,456 \rightarrow \boxed{\times 100} \rightarrow 12345,6 \rightarrow \boxed{\times 100} \rightarrow 1234560$
$\rightarrow \boxed{\div 10} \rightarrow 123456 \rightarrow \boxed{\div 10} \rightarrow 12345,6 \rightarrow \boxed{\div 10} \rightarrow 1234,56 \rightarrow \boxed{\div 10} \rightarrow 123,456 \rightarrow \boxed{\div 100} \rightarrow$
$1,23456 \rightarrow 0,123456 \rightarrow \boxed{\times 1\,000\,000} \rightarrow 123456 \rightarrow$

9.13   Exercise 13

1.1 $2,1$

1.2 $19,11$

1.3 $3,2$

2.1 $2,8$

2.2 $3,85$

2.3 $1,44$

2.4 $1,202$

9.14   Exercise 14

1.1 $0,24$

1.2 $0,024$

1.3 $0,0024$

2.1 $0,28$

2.2 $2,8$

2.3 $0,028$

9.15 Exercise 15

1.1 $4,2$

1.2 $0,85$

2.1 $0,02$

2.2 $1,2$

2.3 $1,2$

2.4 $0,3$

2.5 $0,331$

2.6 $0,009$

3. $99.90 \div 15 = 6.66$

4.1 67

4.2 $0,067$

5.1 $1,6$

5.2 $0,16$

6. $20 \times 0,45 = R9$

7. R $9,23$