

New  
**PIONEERS**  
GRADED  
**MATHS**

1



Rasha Al-Shafee

Verified by: *Dr. Ibrahim Nofal*

  
**AL-ROWAD**  
www.alrowadpub.com

New

PIONEERS  
GRADED

MATHS



*Rasha Al-Shafee*

*Revised by: Dr. Ibrahim Nofal*

# Contents

## Decimals

Addition/ Explore Addition and Subtraction/ Multiply/  
Multiply and Divide by Power of 10/ Divide a Decimal by  
a Whole Number/ Divide Decimal by a Decimal..... 3 -12

## Measurement

Concepts/ Length/ Weight and Capacity/ Angles/ Points, Lines and Rays. .... 13 -19

## Triangles

Congruence/ Rotation, Reflection and Translation/ Quadrilaterals And Other Polygons/  
Circles/ Symmetry/ Perimeter..... 20 -26

## Area

Parallelogram/ Triangle/ Circumference of a Circle/ Solid Figures/ Surface/ Volume..... 27 -32

## Percent

Understanding Percent/ Relate Fraction, Decimal, Percent/ Compare Fraction,  
Decimal, Percent/ Find 10% of a Number/ Percent of a Number..... 33 -37

## Probability

Make Choices/ Probability Concepts/ Theoretical Probability/  
Experimental Probability/ Make Predictions..... 38 -42

## Variables and Functions

43

## Integers and Absolute Value

44

## Integer

Compare and Order Integers / Model Addition of Integers / Model Subtraction  
of Integers / Addition and Subtraction..... 45 -47

## Numbers

Place Value and Power of 10/ Compare and Order Numbers/ Variables and Expressions/  
Use Addition Properties/ Estimate Products and Quotients/ Multiply Whole Numbers. .... 48 -54

## Operations

Order of Operations/ Use Multiplication Properties/ Use Mental Math to Solve Equations..... 55 -57

## Divisibility

Prime and Composite Numbers/ Greatest Common Factors/ Prime Factorization/  
Least Common Multiple..... 58 -62

## Fractions

Equivalent Fractions/ Relate Fractions, Mixed Numbers, and Decimals ..... 63 -64

A decimal is a fraction whose denominator we do not write but we understand to be a power of 10.

**Examples :**

$$\frac{8}{10} = .8$$

$$\frac{28}{100} = .28$$

$$\frac{7}{1000} = .007$$

$$\frac{2345}{10000} = .2345$$

When we have a mixed number, the whole number is written to the left of the left the decimal point and the fraction is written to right of the decimal point.

**Examples :**

$$3 \frac{5}{10} = 3.5$$

$$18 \frac{35}{100} = 18.35$$

$$4 \frac{7}{1000} = 4.007$$

$$12 \frac{1425}{1000} = 12.1425$$

Note: the number of decimal place indicates the number of zeros in the denominator. The number of decimal places is the number of digits the right of the decimal points.

**Examples :**

$$.9 = \frac{9}{10}$$

One decimal place; one zero in the denominator.

$$.09 = \frac{9}{100}$$

Two decimal place; two zeros in the denominator.

$$.009 = \frac{9}{1000}$$

Three decimal place; three zeros in the denominator. And so on.

We can say that the number of decimal places indicates the power of 10.

# Decimals

## Reading and Writing Decimals

When expressing decimals. It is important to use correct language. When reading and writing decimal.

### Examples: read

0.2 : here we have one decimal place to the right of the decimal point. One decimal place means one zero in the denominator (10), so we are dealing with tenths.

0.2 is read: tow tenths.

1.2 one and tow tenths (note that the decimal point means and)

12.25 twelve and twenty-five  
it is important to put the hyphen-between twenty and five because twenty - five is one number.

**More examples** : how would you read and write in words the following numbers.

0.004 .....

You should have noted that we have three decimal places, than we have three zeros in the denominator (1000). So we are dealing with thousandths.

0.004 : four thousandths

0.03 : three hundredths

0.123 : one hundred twenty-three thousandths

245.18 : tow hundred forty-five and eighteen hundredths .

### Exercises:

1. write the following in words

0.200

0.310

235

0.05

125.015

2.a which of the following is equal to :3.145

- a. Three thousand one hundred and forty-five
- b. three and one hundred forty-five
- c. three and one hundred forty -five thousands.

2.b which of the following is equal to :0.015

- a. fifteen hundredths.
- b. fifteen thousandths
- c. one five thousands

3. write the following as decimals

a. one twenty-three thousandths:

b. Tow and forty-five hundredths.

c.  $2\frac{15}{100}$                        $23\frac{5}{1000}$

Note: In daily life we'd usually read, for example : 127.578

as: one hundred twenty-seven point five seven eight-

15.15 : is read fifteen pont one five and so on

4. match the number on the right with its home on the left.

356 .

3.15 .

3.56 .

. three and fifty-six hundredths.

. three and five hundred sixty thousandths

. three thousand five hundred sixty

# Add Decimals

Find  $3.8 + 0.95$

## Step 1:

Use the decimal points to line up the addends. Add zeros as needed.

$$\begin{array}{r} 3.80 \\ + 0.95 \\ \hline \end{array}$$

## Step 2:

Add the hundredths.

$$\begin{array}{r} 3.80 \\ + 0.95 \\ \hline 5 \end{array}$$

## Step 3:

Add the tenths.

$$\begin{array}{r} 1 \\ 3.80 \\ + 0.95 \\ \hline 75 \end{array}$$

## Step 4:

Add the ones. Align the decimal point in the sum with the decimal point in the addends.

$$\begin{array}{r} 1 \\ 3.80 \\ + 0.95 \\ \hline 4.75 \end{array}$$

Add. Use a calculator to check.

$$\begin{array}{r} 12.42 \\ + 9.79 \\ \hline \end{array}$$

$$\begin{array}{r} 1.08 \\ + 36.94 \\ \hline \end{array}$$

$$\begin{array}{r} 7.11 \\ + 6.93 \\ \hline \end{array}$$

$$\begin{array}{r} 6.13 \\ + 45.2 \\ \hline \end{array}$$

$$12.3 + 4.07$$

$$\begin{array}{r} 6.2 \\ + 74.75 \\ \hline \end{array}$$

$$5.72 + 0.108 + 93.25$$

$$1.004 + 32.7$$

$$8.004 + 0.9 + 12.3$$

# Explore

## Addition and Subtraction With Decimals

Find:  $0.37 + 0.09$

| Step 1:                         | Step 2:                          | Step 3:                     |
|---------------------------------|----------------------------------|-----------------------------|
| Change the decimals to fraction | Add the fraction.                | Write the sum as a decimal. |
| $0.37 = \frac{37}{100}$         | $\frac{37}{100} + \frac{9}{100}$ | $\frac{46}{100} = 0.46$     |
| $0.09 = \frac{9}{100}$          | $\frac{46}{100}$                 |                             |

Change each decimal to fraction. Model each addition and subtraction.  
Write each sum as decimal.

$0.56 + 0.98$

---

---

$0.29 + 0.68$

---

---

$0.4 + 0.87$

---

---

$0.19 - 0.08$

---

---

$0.7 - 0.5$

---

---

$5.17 + 3.65$

---

---

$3.28 - 1.46$

---

---

$5.8 - 4.9$

---

---

$0.8 - 0.25$

---

---



# Subtract Decimals

Find:  $46.2 + 8.75$

**Step 1:**

Use the decimal points to line up the digits. Add zeros as needed.

$$\begin{array}{r} 46.20 \\ - 8.75 \\ \hline \end{array}$$

**Step 2:**

Subtract the hundredths.

$$\begin{array}{r} \phantom{1} \phantom{10} \\ 46.\overset{1}{\cancel{2}}\overset{10}{0} \\ - 8.75 \\ \hline 5 \end{array}$$

**Step 3:**

Subtract the tenths.

$$\begin{array}{r} \phantom{5} \phantom{11} \\ 46.\overset{5}{\cancel{2}}\overset{11}{0} \\ - 8.75 \\ \hline 45 \end{array}$$

**Step 4:**

Subtract the ones and tens. Write the decimal point in the answer.

$$\begin{array}{r} \phantom{3} \phantom{15} \\ 46.\overset{3}{\cancel{4}}\overset{15}{0} \\ - 8.75 \\ \hline 37.45 \end{array}$$

Subtract. Add to check your answer.

$$\begin{array}{r} 7.3 \\ - 1.5 \\ \hline \end{array}$$

$$\begin{array}{r} 8.4 \\ - 6.6 \\ \hline \end{array}$$

$$\begin{array}{r} 23.55 \\ - 8.70 \\ \hline \end{array}$$

$9.1 - 2.48 =$

$6.04 - 3.9 =$

$10 - 4.89 =$

$6.7 - 3.112 =$

$15.22 - 12.67 =$

# Multiply Decimals

Find:  $0.7 \times 0.3$

**Step 1:** Multiply. Ignore the decimal points.

$$\begin{array}{r} 7 \\ \times 3 \\ \hline 21 \end{array}$$

**Step 2:** Place the decimal point in the product.

$$\begin{array}{r} 0.7 \quad 1 \text{ decimal place} \\ \times 0.3 \quad 1 \text{ decimal place} \\ \hline 0.21 \quad 2 \text{ decimal places} \end{array}$$

Multiply

$0.9 \times 0.3$

$1.25 \times 4.7$

$0.7 \times 0.2$

$0.3 \times 6.2$

$1.52 \times 23$

$1.57 \times 6.6$

Compare. Write  $>$ ,  $<$ , or  $=$ .

$0.4 \times 6.1 \quad \bigcirc \quad 12.2 \times 0.2$

$3.5 \times 1.7 \quad \bigcirc \quad 4.6 \times 1.8$

$0.9 \times 5.6 \quad \bigcirc \quad 2.2 \times 1.7$

$0.4 \times 3.8 \quad \bigcirc \quad 7.6 \times 0.2$

# Multiply and Divide by Powers of 10

$$0.0009 \times 10^1 = 0.009$$

$$0.0009 \times 10^2 = 0.09$$

$$0.0009 \times 10^3 = 0.9$$

$$0.0009 \times 10^4 = 9$$

$$78 \div 10^1 = 7.8$$

$$78 \div 10^2 = 0.78$$

$$78 \div 10^3 = 0.078$$

$$78 \div 10^4 = 0.0078$$

Multiply or divide using patterns.

$$8.3 \div 10^1$$

$$0.755 \times 10^3$$

$$2,615 \times 10^1$$

$$1.624 \times 10^3$$

$$0.38 \times 10^2$$

$$57.91 \div 10^1$$

$$1.52 \div 10^1$$

$$3.73 \times 10^2$$

$$9,800 \div 10^3$$

# Divide a Decimal by a Whole Number

Find:  $4.2 \div 7$

**Step 1:** Divide the dividend, disregarding the decimal point.

$$\begin{array}{r} 6 \\ 7 \overline{)42} \\ -42 \\ \hline 0 \end{array}$$

**Step 2:** Place a decimal point in the quotient above the decimal point in dividend.

$$\begin{array}{r} 0.6 \\ 7 \overline{)4.2} \\ -4.2 \\ \hline 0 \end{array}$$

Divide and check.

$0.56 \div 8$

$21.06 \div 9$

$7.5 \div 5$

$9 \overline{)8.1}$

$5 \overline{)5.75}$

$6 \overline{)0.012}$

$4 \overline{)25.92}$

$2 \overline{)6.32}$

$7 \overline{)3.22}$

# Divide a Decimal by a Decimal

$$3.75 \div 1.5$$

**Step 1:** Multiply the divisor and dividend by the same power of 10 so that the divisor is a whole number.

$$1.5 \overline{)3.75} \longrightarrow 15 \overline{)37.5}$$

**Step 2:** Divide. Place a decimal point in the quotient over the decimal point in the dividend.

$$\begin{array}{r} 2.5 \\ 15 \overline{)37.5} \\ - 30 \phantom{0} \\ \hline 75 \\ - 75 \\ \hline 0 \end{array}$$

Divide. Round to the nearest hundredth. Check that your answer is reasonable.

$$2.4 \overline{)9.984}$$

$$0.4 \overline{)20.8}$$

$$0.4 \overline{)0.28}$$

$$0.2 \overline{)5.6}$$

$$0.06 \overline{)0.018}$$

$$7.2 \overline{)25.2}$$

$$0.9 \overline{)14.76}$$

$$0.8 \overline{)5.76}$$

$$3.6 \overline{)20.88}$$

# Measurement Concepts

## Units of Measure

The smaller the unit of measure you use, the more **precise** the measure.



The segment is:

3 inches long when measured to the nearest inch.

$2\frac{3}{4}$  inches long when measured to the nearest quarter inch.

Decide what unit of measure to use. Then measure each item.

The width of this paper \_\_\_\_\_

The length of your ring finger. \_\_\_\_\_

The width of the classroom door. \_\_\_\_\_

The length of a key. \_\_\_\_\_

The length of your leg from heel to knee. \_\_\_\_\_

Tell whether a more precise measurement is needed or if an estimate is sufficient. Explain your answer.

You need to find the width of a piano to see if it will fit through a doorway.

\_\_\_\_\_

You need to know the distance from your house to school to see about how far you travel each day.

\_\_\_\_\_

# Customary Units of Length

12 inches (in) = 1 foot (ft)  
3 feet = 1 yard (yd)  
5,280 feet = 1 mile (mi)  
1,760 yards = 1 mile

How many feet are in 288 inches?  
Remember; divide to change from a smaller to a larger unit.

How many feet are in 4 yards 2 feet?  
Remember; multiply to change from a larger to a smaller unit.

$$288 \text{ in} = \square \text{ ft}$$

$$288 \div 12 = 24$$

$$288 \text{ in} = 24 \text{ ft}$$

$$4 \text{ yd } 2 \text{ ft} = \square \text{ ft}$$

$$4 \times 3 = 12$$

$$12 \text{ ft} + 2 \text{ ft} = 14 \text{ ft}$$

Complete.

$$\text{— ft} = 6 \text{ yd}$$

$$3 \text{ mi} = \text{— ft}$$

$$24 \text{ yd} = \text{— ft}$$

$$114 \text{ in} = \text{— ft — in}$$

$$8,000 \text{ ft} = \text{— mi — ft}$$

$$180 \text{ in} = \text{— ft}$$

Compare. Write  $>$ ,  $<$ , or  $=$  for each.

$$6 \text{ ft} \bigcirc 72 \text{ in}$$

$$150 \text{ in} \bigcirc 15 \text{ ft}$$

$$2 \text{ mi} \bigcirc 10,000 \text{ ft}$$

Which unit would you use to measure each?  
Write inch, foot, yard, or mile.

The length of a puppy \_\_\_\_\_

The length of a soccer field \_\_\_\_\_

The width of your room \_\_\_\_\_

The height of a van \_\_\_\_\_