GRADE 8 MATHEMATICS
ANA REVISION

Developing skills for overall school success!

Learner Workbook

GAUTENG PROVINCE
EDUCATION
REPUBLIC OF SOUTH AFRICA

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GAUTENG PROVINCE
EDUCATION
REPUBLIC OF SOUTH AFRICA

MARKS	

ANNUAL NATIONAL ASSESSMENT 2014
GRADE 8 MATHEMATICS
EXEMPLAR PAPER

MARKS: 120

TIME: 2½ hours

PROVINCE _____

REGION _____

DISTRICT _____

SCHOOL NAME _____

EMIS NUMBER (9 digits) | | | | | | | | | |

CLASS (e.g. 8A) _____

SURNAME _____

NAME _____

GENDER (✓) | BOY | | | GIRLS | |

DATE OF BIRTH | C | C | Y | Y | D | D |

This test consists of 15 pages, excluding the cover pages

Instructions to the learner

1. Read all the instructions carefully.
2. Question 1 consists of 10 multiple-choice questions. Circle the letter of the correct answer.
3. Answer questions 2 to 14 in the spaces or frames provided.
4. Show all working.
5. Give a reason for each statement in Question 7.
6. The test counts 120 marks.
7. The duration of the test is 2½ hours
8. The teacher will lead you through the practice exercise before you start the test.
9. You may use an approved scientific calculator (non-programmable and non-graphical).

Practice exercise

Circle the letter of the correct answer.

Which of the numbers is an irrational number?

A. 3

B. -3

C. $\sqrt{11}$

D. $\sqrt{9}$

You have answered the question correctly if you have circled B.

QUESTION 1

1.1 Which number is missing?

$$\frac{1}{2}\ ;\ \frac{1}{4}\ ;\ \frac{1}{8}\ ;\ \ldots\ ;\ \frac{1}{32}$$

A. 16

B. $\frac{1}{64}$

C. $\frac{4}{64}$

D. $\frac{2}{16}$

1.2 Which statement is incorrect?

A. The only prime factors of 24 are 2 and 3 .

B. The difference between - 8 and 3 is 11.

C. All integers are natural numbers.

D. $\sqrt[3]{-27}$ is a rational number.

1.3 R 120 decreased by 5% is equal to ….

A. R 95

B. R 100

C. R 114

D. R 18

1.4 Complete the statement $\sqrt{144} - 2^2 + \sqrt[3]{8}$ =

A. 11

B. 14

C. 12

D. 10

1.5 The expression $2x + 2 - x + \frac{3x^2}{3x}$ has …

A. 4 terms

B. 2 terms

C. 3 terms

D. 1 term

1.6 Complete $\frac{3}{4}$ of $1\frac{1}{3} + 1\frac{1}{3} =$

A. 3

B. 5

C. 2

D. 12

1.7 The area of a rectangle with length of 15 cm and width of 7 cm is

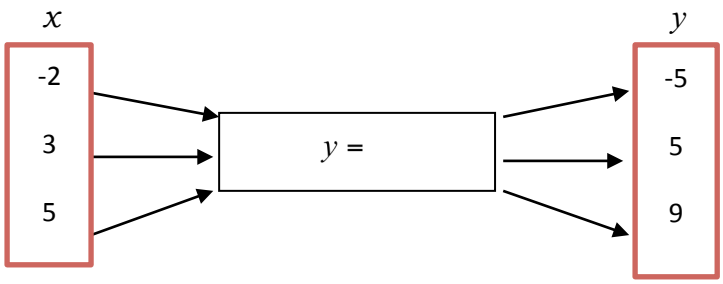
A. 105 cm

B. 45 cm^2

C. 105 cm^3

D. 105 cm^2

1.8 Write down the equation defining the relationship between the input(x) on the left and output(y) on the right:



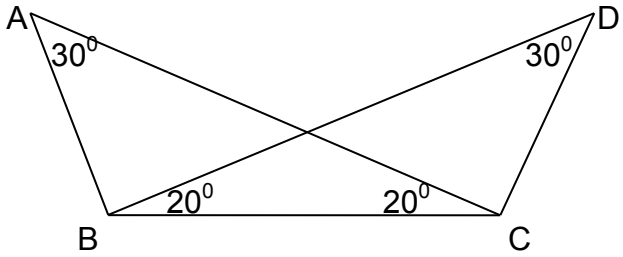
A. $y = 2x + 1$

B. $y = 2x - 1$

C. $y = 3x - 2$

D. $y = x - 2$

1.9 Why is $\Delta ABC \text{ /// } \Delta DCB$?



A. SSS

B. AAA

C. 90^0,HS

D. SAS

1.10 A visitor to the Kruger National Park recorded the following number of impala over 15 days:

25, 80, 34, 26, 21, 65, 28, 21, 39, 21, 30, 34, 21, 28, 40

The mean of the data is

A. 26

B. 45

C. 34,2

D. 34

Total [10]

QUESTION 2

2.1 Write 0,000 003 56 in scientific notation. (2)

2.2 Divide R5 600 in the ratio 4 : 5 : 7. (4)

2.3 Simplify.

2.3.1 $\sqrt{x^4} + 2\sqrt{x^4}$ (3)

2.3.2 $\dfrac{12x^3y^4 + 15x^4y^3}{3x^3y^3}$ (3)

2.3.3 $\dfrac{(3x)(2x^5) - 2x^3(6x^2)}{6x^4}$ (4)

_____

_____

2.4 Multiply and simplify if possible.

$3x^2(x+2)+2x(x^2+3x)$ (3)

_____

_____

_____

[19]

QUESTION 3

3.1 If $x = 2$ and $y = -5$ find the value of

$4x^2 + 3y^2$ (3)

3.2 Solve for x.

3.2.1 $7 - 3x = 2x - 3$ (3)

3.2.2 $10 - 4(2x - 1) = -2(3 - x)$ (5)

3.2.3 $\frac{3x+1}{2} = 5$ (4)

3.2.4 $3^{x+1} = 81$ (3)

_____

_____

_____

_____

[18]

QUESTION 4

4.1 Twenty two litres of petrol cost R300. How much will you pay for one litre of petrol? (2)

_____

_____

_____

_____

4.2 A car travels a distance of 330 km at an average speed of 110 km/h. How long does it take the car to travel this distance? (4)

_____

_____

_____

_____

_____

4.3 Calculate the amount that will be in the bank after 4 years if R2500 was invested at 9% p.a. simple interest. (3)

_____

_____

_____

_____

4.4 A pair of jeans marked at R250-00 is sold at a discount of 13%. Determine the selling price. (3)

_____

_____

_____

_____

[12]

QUESTION 5

5.1 Study the pattern below and then answer the questions that follow.

2 ; 5 ; 8 ; x ; y ; z ; …

5.1.1 Find the terms represented by x ; y and z (3)

_____

_____

_____

5.1.2 Describe the pattern in 5.1.1 in your own words (2)

_____

_____

5.1.3 Write down the equation representing the general term of this pattern in the form T_n = ….. (3)

_____

_____

_____

5.1.4 Use your formula to find the 9^{th} term in the sequence (3)

_____

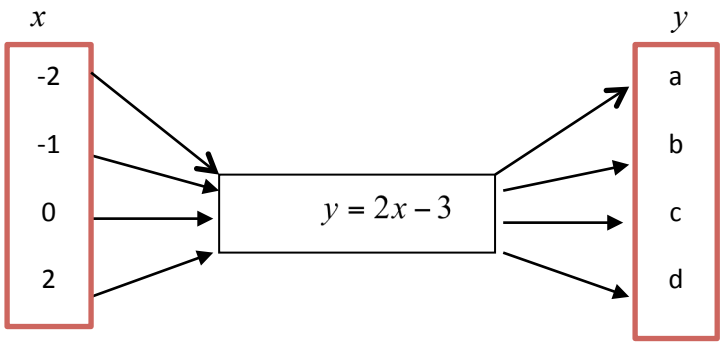
_____

_____

[11]

QUESTION 6

Study the flow diagram below and answer questions that follow.



6.1 Copy and complete the table using the flow diagram. (4)

x	-2	-1	0	2
y	a	b	c	d

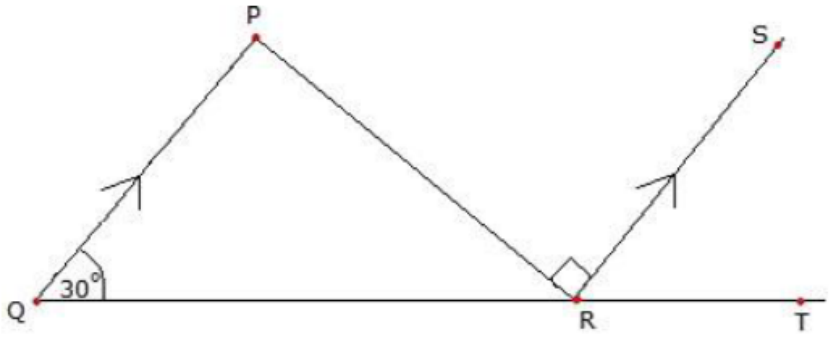
6.2 Use your table in 6.1 to draw a graph defining the equation $y = 2x - 3$. **Use Annexure A.** (3)

6.3 Is the graph an increasing or decreasing function? Explain. (3)

[10]

QUESTION 7

7.1 In the diagram below PQ // SR, $\angle PQR = 30^0$, $\angle PRS = 90^0$. Calculate, with reasons, the size of:

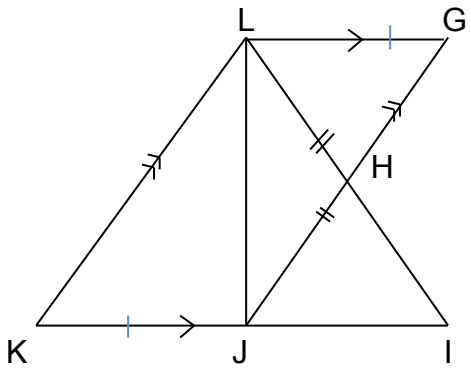


7.1.1 ∠SRT (2)

7.1.2 ∠QPR (2)

7.1.3 ∠PRQ (4)

7.2 ∠LJI = 90^0, LI = LK and LH = HJ.



7.2.1 Prove, with reasons, that ΔLGJ ≡ ΔJIL. (6)

_____

_____

_____

_____

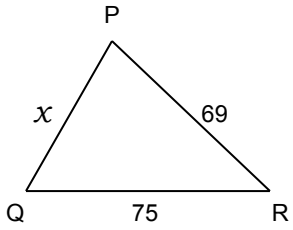
_____

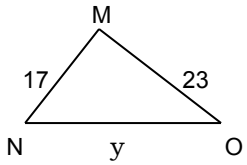
_____

7.2.2 If LJ = 5 cm and LI = 8 cm calculate the length of JI. (3)
Round your answer to one decimal place.

_____

7.3 ΔPQR /// ΔMNO. Find the lengths of unknown sides. (5)

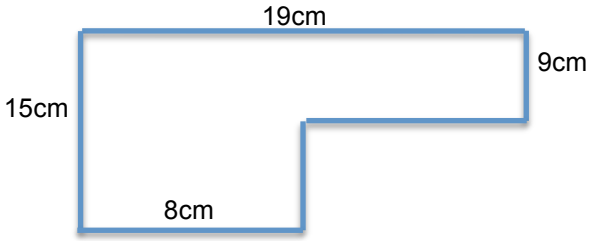




[22]

QUESTION 8

8.1 Study the diagram below and answer the questions that follow



8.1.1 Calculate the perimeter (2)

_____

_____

_____

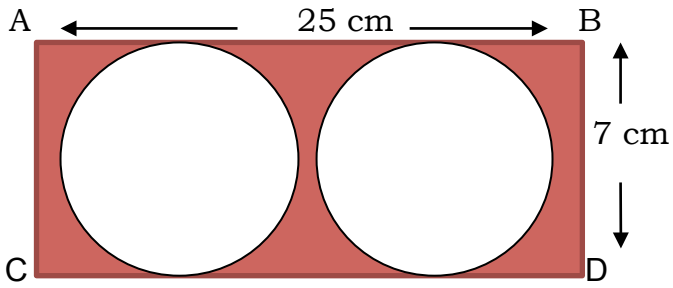
8.1.2 Calculate the area (3)

_____

_____

_____

8.2 Calculate the area of the shaded region. (Remember $\pi \approx \frac{22}{7}$) (4)



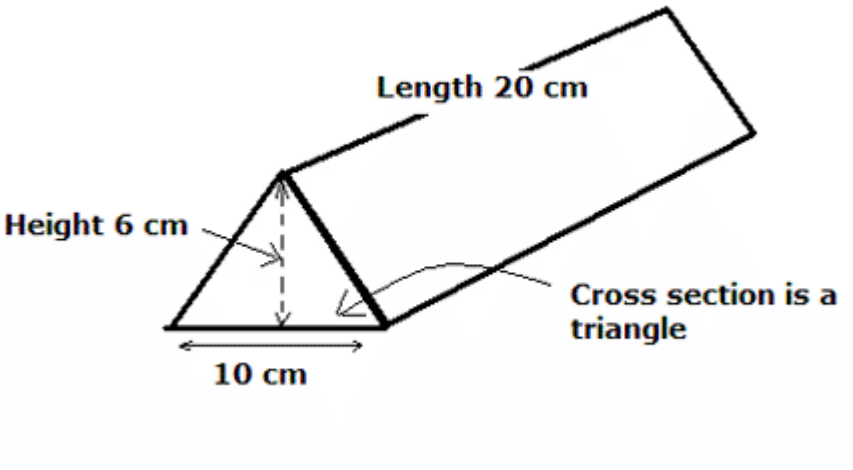
_____

_____

_____

(3)

8.3 Calculate the volume of the prism



_____

_____

_____

[12]

QUESTION 9

The table below shows the number of learners per sport offered at a school in a year.

Sport	Number of learners	Number of boys	Number of girls
Rugby	60	60	0
Netball	65	0	65
Swimming	60	20	40
Cricket	80	20	60
Soccer	80	80	0
Hockey	135	60	75

9.1 Draw a bar graph representing the number of learners per sport. **Use Annexure B.** (3)

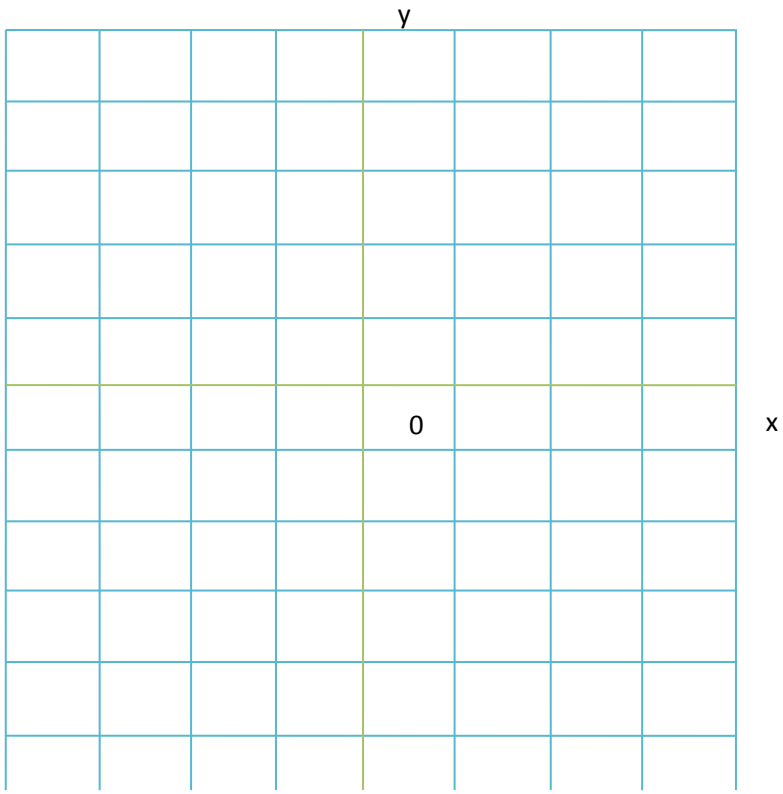
9.2 Draw a double bar graph representing the number of boys and number of girls per sport in the school. **Use Annexure C.** (3)

[6]

Total **[120]**

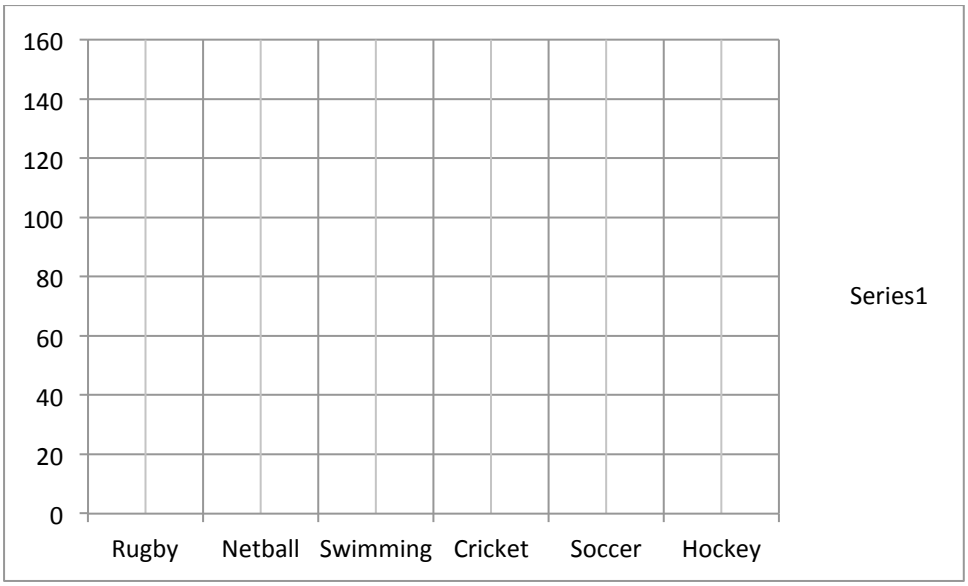
ANNEXURE A

QUESTION 6.2



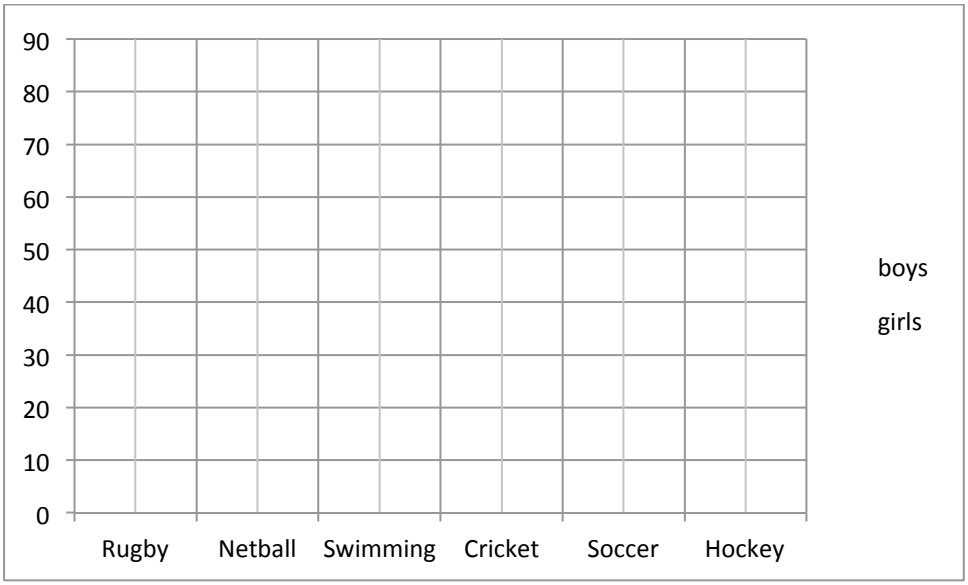
ANNEXURE B

QUESTION 9.1



ANNEXURE C

QUESTION 9.2



ANNUAL NATIONAL ASSESSMENT 2014

GRADE 8 MATHEMATICS

EXEMPLAR PAPER

MEMORANDUM

MARKS: 120

TIME: 2½ hours

QUESTION 1

1.1	C
1.2	C
1.3	C
1.4	D
1.5	B
1.6	C
1.7	D
1.8	B
1.9	B
1.10	C

Total [10]

QUESTION 2

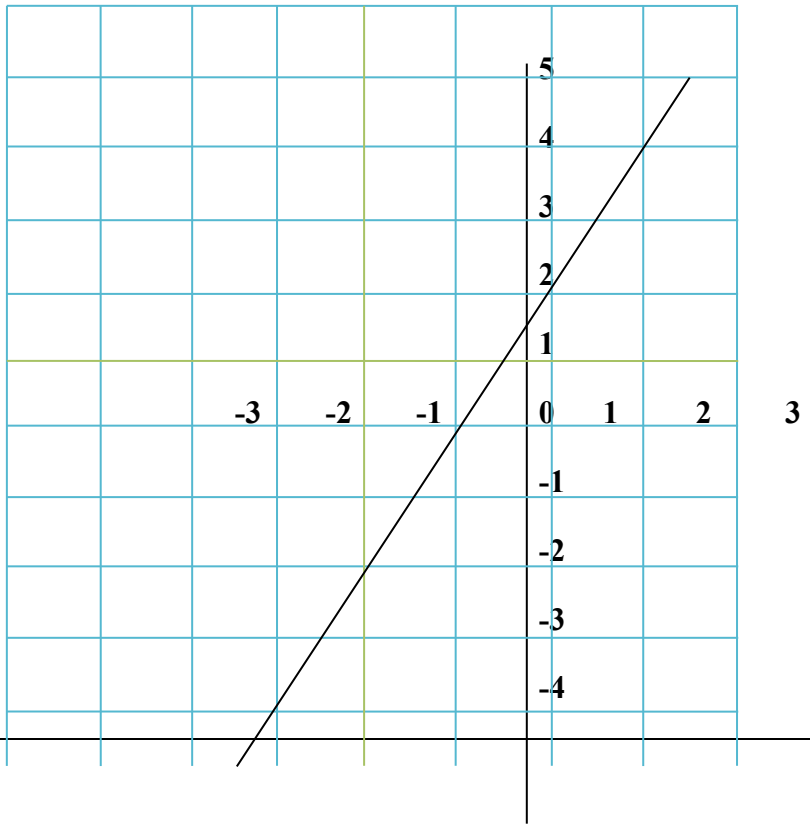
2.1	0,000 003 56 = $3{,}56$ ✓ × 10^{-6} ✓			(2)
2.2	4 + 5 + 7 = 16 ✓ $\frac{4}{16} \times 5600$ = R1 400 ✓ $\frac{5}{16} \times 5600$ = R1 750 ✓ $\frac{7}{16} \times 5600$ = R2 450 ✓			(4)
2.3	2.3.1	$\sqrt{x^4} + 2\sqrt{x^4}$ = x^2 ✓ + $2(x^2)$ ✓ = $3x^2$ ✓		(3)
	2.3.2	$\frac{12x^3y^4 + 15x^4y^3}{3x^3y^3}$ $= \frac{12x^3y^4}{3x^3y^3} + \frac{15x^4y^3}{3x^3y^3}$ ✓ = $4y$ ✓ + $5x$ ✓		(3)
	2.3.3	$\frac{(3x)(2x^5) - 2x^3(6x^2)}{6x^4}$ $= \frac{6x^6 - 12x^5}{6x^4}$ ✓✓ = x^2 ✓ - $2x$ ✓		(4)
2.4	$3x^2(x+2) + 2x(x^2+3x)$ = $3x^3 + 6x^2$ ✓ + $2x^3 + 6x^2$ ✓ = $5x^3 + 12x^2$ ✓			(3)
Total				[19]

QUESTION 3				
3.1	$4x^2 + 3y^2$ $= 4(2)^2 + 3(-5)^2$ ✓			(3)
	$= 16 + 75$ ✓ $= 91$ ✓			
3.2				
	3.2.1	$7 - 3x = 2x - 3$ $-3x - 2x = -3 - 7$ ✓ $-5x = -10$ ✓ $x = 2$ ✓		(3)
	3.2.2	$10 - 4(2x - 1) = -2(3 - x)$ $10 - 8x + 4$ ✓ $= -6 + 6x$ ✓ $-8x - 6x = -6 - 4 - 10$ ✓ $-14x = -20$ ✓ $x = \frac{10}{7}$ ✓		(5)
	3.2.3	$\frac{3x+1}{2} = 5$ $\frac{3x+1}{2} \times 2 = 5 \times 2$ ✓ $3x + 1 = 10$ ✓ $3x = 9$ ✓ $x = 3$ ✓		(4)
	3.2.4	$3^{x+1} = 81$ $3^{x+1} = 3^4$ ✓ $x + 1 = 4$ ✓ $x = 3$ ✓		(3)
Total				[18]

QUESTION 4				
4.1	22 $ltr \rightarrow$ R300 1 $ltr \rightarrow \frac{1ltr \times R300}{22ltr}$ ✓ = R13,64 ✓			(2)
4.2	$speed = \frac{dis\tan ce}{time}$ ✓ $time = \frac{dis\tan ce}{speed}$ ✓ $time = \frac{330km}{110km/h}$ ✓ $= 3km$ ✓			(4)
4.3	$A = P(1+in)$ ✓ $A = 2500(1+0,09\times 4)$ ✓ $= R3400$ ✓			(3)
4.4	$Selling\ \Pr ice = R250 \times \frac{87}{100}$ ✓✓ $= R217,50$ ✓			(3)
Total				[12]
QUESTION 5				
5.1				
	5.1.1	$x = 11$ ✓ $y = 14$ ✓ $z = 17$ ✓		(3)
	5.1.2	3 is added every time to get the next term starting with the first term 2. ✓✓		(2)

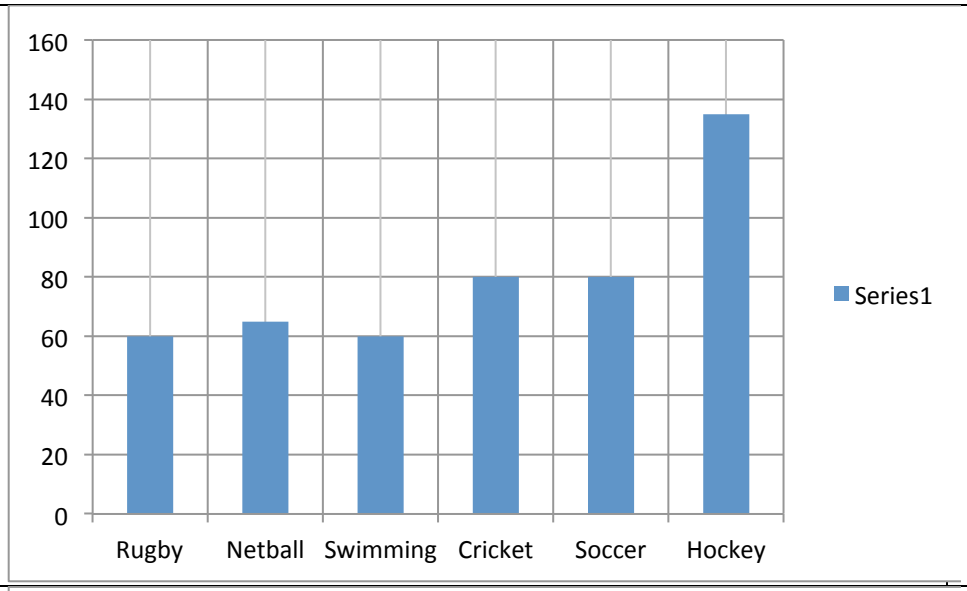
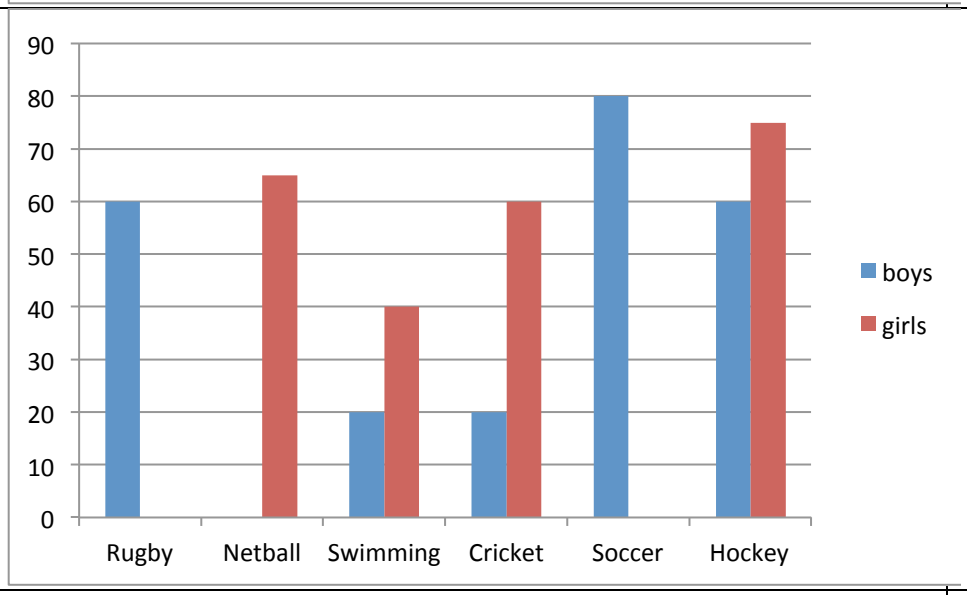
	5.1.3	$T_1 = 2 = 3(1) - 1$ $T_2 = 5 = 3(2) - 1$ $T_3 = 8 = 3(3) - 1$ ✓(*method*) $Tn = 3n - 1$ ✓✓		(3)
	5.1.4	$Tn = 3n - 1$ $T_9 = 3(9) - 1$ ✓ $= 27 - 1$ ✓ $= 26$ ✓		(3)
Total				[11]
QUESTION 6				
6.1	Copy and complete the table using the flow diagram.			(4)

x	-2	-1	0	2
y	-7 ✓	-5 ✓	-3 ✓	1 ✓

6.2	$y = 2x - 3$.  	line ✓ x-intercept✓ y-intercept✓ (3)	

6.3	Increasing. ✓ As x increases✓ y also increases. ✓		(3)
Total			[10]
QUESTION 7			
	7.1.1 $\angle SRT = 30^0$ ✓ [corresponding $\angle s$] ✓		(2)
	7.1.2 $\angle QPR = 90^0$ ✓ [alternate $\angle s$] ✓		(2)
	7.1.3 $\angle PRQ + 30^0 + 90^0 = 180^0$ ✓ [sum of $\angle s$ of Δ] ✓ $\angle PRQ = 180^0 - (30^0 + 90^0)$ ✓ $= 60^0$ ✓		(4)
7.2	$\angle LJI = 90^0$, LI = LK and LH = HJ.		
	7.2.1 In ΔLGJ and ΔJIL GJ = IL [given] ✓ LJ is common ✓ $\angle LJI + \angle GLJ = 180^0$ [co-interior $\angle s$] ✓ $\angle GLJ = 180^0 - 90^0$ ✓ $= 90^0 = \angle LJI$ ✓ $\therefore \Delta LGJ \equiv \Delta JIL$ [90^0,HS] ✓		(6)
	7.2.2 $LI^2 = LJ^2 + JI^2$ [Pythagoras] $JI^2 = LI^2 - LJ^2$ ✓ $= 8^2 - 5^2$ $= 39$ ✓ JI = $\sqrt{39}$ = 6,2 cm ✓		(3)

7.3	$\frac{x}{17} = \frac{69}{23}$ ✓ $x = \frac{69}{23} \times 17$ ✓ $= 51$ ✓ $\frac{y}{75} = \frac{23}{69}$ ✓ $y = \frac{23}{69} \times 75$ $y = 25$ ✓		(5)
Total			[22]
QUESTION 8			
8.1			
	8.1.1 Perimeter = 15 cm + 8 cm + 6 cm + 11cm + 9 cm + 19 cm ✓ = 68 cm ✓		(2)
	8.1.2 Area = 15 cm × 8 cm + 11cm × 9 cm ✓ = 120 cm^2 + 99 cm^2 ✓ = 219 cm^2 ✓		(3)
8.2	Area = $lb - \pi r^2$ ✓ = 25cm × 7cm - $\frac{22}{7}$ × $(3,5cm)^2$ = 175cm^2 – 38,5cm^2 ✓ = 136,5cm^2 ✓		(4)
Total			[9]
QUESTION 9			

9.1		(3)
9.2		(3)
TOTAL		[6]

GRADE 8 MATHEMATICS

Learner:_____

School:_____

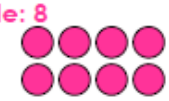
Year :_____

Task 1 (Number systems)

Worksheet Activity 1

1. Use a drawing to show that the following numbers are not prime numbers but composite numbers.

Example: 8



2 x 4

1 x 8

8 can be divided by 1, 2, 4 and 8

In later lessons learners will understand that these are factors

a. 9
b. 18
c. 155
d. 57
e. 39
f. 68
g. 46
h. 88
i. 92
j. 14

2. Identify all the prime numbers from 1–100.

3. How would you write the following numbers in prime numbers?

Example: 12

= 2 x 2 x 3

(2 and 3 are prime numbers because 2 = 2 x 1 and 3 = 3 x 1)

a. 36
b. 60
c. 105
d. 420
e. 48
f. 1 800
g. 1 375
h. 770
i. 56
j. 1 575

4. What numbers are these? Why?

2	3	5	7	11	13	17	19	23	29	31	37	41	43	47	53	59	61	67
71	73	79	83	89	97	101	103	107	109	113	127	131	137	139	149	151	157	163
167	173	179	181	191	193	197	199	211	223	227	229	233	239	241	251	257	263	269
271	277	281	283	293	307	311	313	317	331	337	347	349	353	359	367	373	379	383
389	397	401	409	419	421	431	433	439	443	449	457	461	463	467	479	487	491	499
503	509	521	523	541	547	557	563	569	571	577	587	593	599	601	60	613	617	619
631	641	643	647	653	659	661	673	677	683	691	701	709	719	727	733	739	743	751
757	761	769	773	787	797	809	811	821	823	827	829	839	853	857	859	863	877	881
883	887	907	911	919	929	937	941	947	953	967	971	977	983	991	997			

1. Colour the 2-times table red. Colour the 3-times to 10-times tables other colours.

x	1	2	3	4	5	6	7	8	9	10
1	1	2	3	4	5	6	7	8	9	10
2	2	4	6	8	10	12	14	16	18	20
3	3	6	9	12	15	18	21	24	27	30
4	4	8	12	16	20	24	28	32	36	40
5	5	10	15	20	25	30	35	40	45	50
6	6	12	18	24	30	36	42	48	54	60
7	7	14	21	28	35	42	49	56	63	70
8	8	16	24	32	40	48	56	64	72	80
9	9	18	27	36	45	54	63	72	81	90
10	10	20	30	40	50	60	70	80	90	100

2. Write down the 2-times table (a). Then write down only the answers (b). Then complete the sentence (c).

a. 2 x 1 = 2, 2 x 2 = 4, 2 x 3 = 6, … 2 x 12 = 24

b. 2, 4, 6, … 24

c. These are multiples of _____.

Do the same with the 3-times to 12-times tables.

3. Complete the following:

a. The multiples of 6 are 6, 12, 18, … 72, or

b. $M_6 = \{\_\_\}$

(Do the same with the multiples of 4, 7, 9 and 12).

1. Revise: write down the first 12 multiples of:

a. $M_5 = \{...\}$

b. $M_{10} = \{...\}$

c. $M_6 = \{...\}$

d. $M_{11} = \{...\}$

e. $M_{25} = \{...\}$

2. Write down the first 12 multiples and circle all the common multiples of the following:

Example: M2 = 2, (4), 6, (8), 10, (12), 14, (16), 18, (20), 22, (24)
M4 = (4), (8), (12), (16), (20), (24), 28, 32, 36, 40, 44, 48
The lowest common multiple is 4.

a. $M_3 = \{...\}$

b. $M_4 = \{...\}$

What is the lowest common multiple?

Do the same with:

M_2 and M_6; M_4 and M_5; M_8 and M_6; M_8 and M_9

3. What is the abbreviation for the lowest common fraction?

4. What is the LCM for the following?

Example: M_4 and M_7

M_4: { 4, 8, 12, 16, 20, 24, 28}

M_7: {7, 14, 21, 28}

a. M_2 and M_8

b. M_3 and M_6

c. M_5 and M_3

d. M_4 and M_8

e. M_7 and M_6

f. M_6 and M_9

g. M_{10} and M_{100}

h. M_3, M_4 and M_{12}

i. M_{25} and M_{75}

j. M_5, M_{10} and M_{20}

1. Complete the following, using the example to guide you.

Example: i) F_{12} are 1, 2, 3, 4, 6 and 12

F_{30} are 1, 2, 3, 5, 6, 10, 15 and 30

ii) The common factors are: 1, 2, 3, 6

iii) The highest common factor is 6.

a. F_8 : {...}
F_{16} : {...}

b. F_3 : {...}
F_{12} : {...}

c. F_3 : {...}
F_9 : {...}

d. F_6 : {...}
F_{24} : {...}

e. F_5 : {...}
F_{15} : {...}

f. F_{12} : {...}
F_{36} : {...}

2. Complete the table.

	Symbol	Factors	Common factors	Highest common factors
Example: 4 and 8	F_4 and F_8	1, 2, 4, 1, 2, 4, 8	1, 2, 4	4
a. 6 and 12				
b. 7 and 28				
c. 9 and 36				
d. 8 and 24				
e. 3 and 21				
f. 4 and 36				
g. 15 and 45				
h. 16 and 64				
i. 12 and 48				
j. 10 and 100				

Learners complete the following questions in their **writing books**.

1. **What is a factor?**

2. **What does F_{12} stand for?**

3. **Revision: write the factors for:**

Example: $F_{16} = \{1, 2, 4, 8, 16\}$

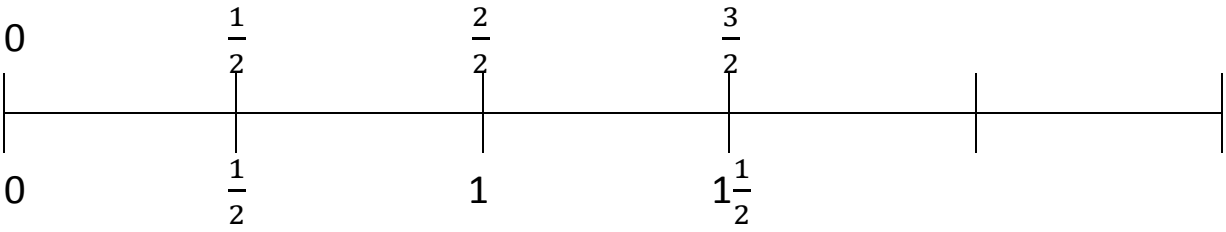
a. $F_8 = \{...\}$ b. $F_{24} = \{...\}$ c. $F_{21} = \{...\}$
d. $F_4 = \{...\}$ e. $F_{36} = \{...\}$ f. $F_{48} = \{...\}$
g. $F_{12} = \{...\}$ h. $F_{42} = \{...\}$ i. $F_{60} = \{...\}$
j. $F_{18} = \{...\}$

4. **What is a prime factor? Give five examples.**

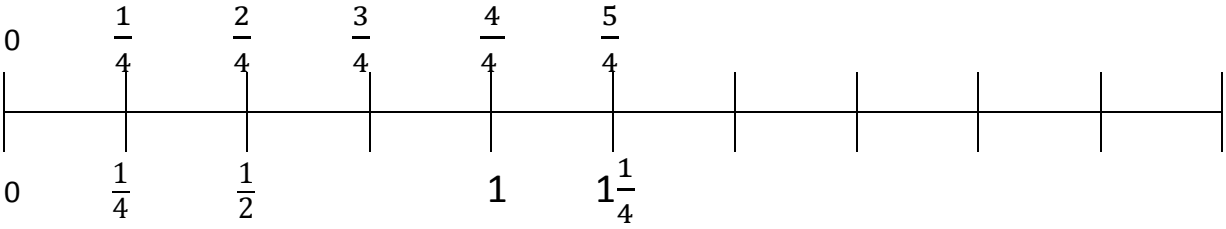
Task 2 (FRACTIONS)

Learner Worksheet Activity 1

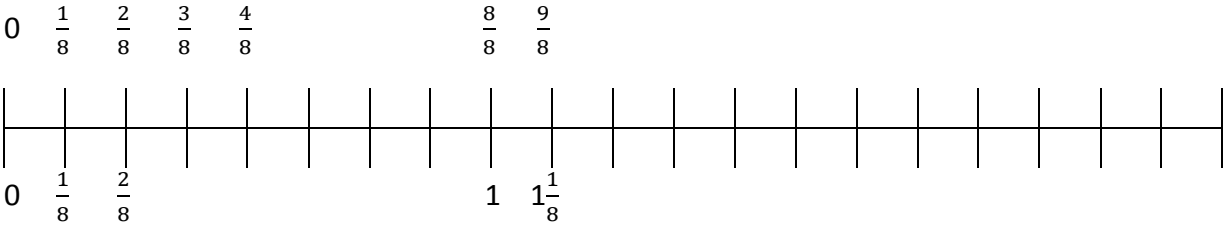
Count in steps of **one half**:



Count in steps of **one quarter**:



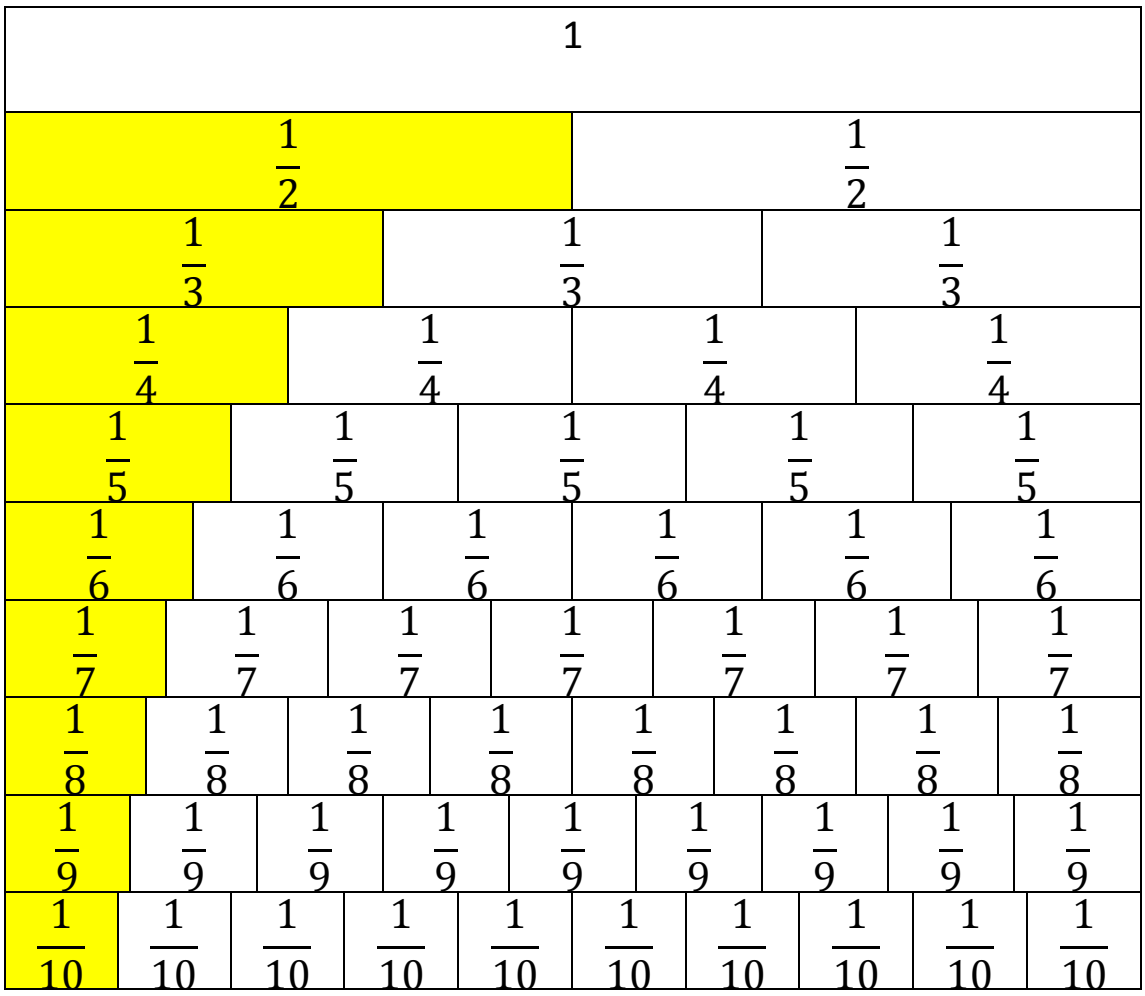
Count in steps of **one eight**



Write each of these numbers in another way:

$\frac{9}{4}$ =	$\frac{13}{8}$ =	$3\frac{1}{4}$ =	$=2\frac{5}{8}$	$\frac{7}{2}$ =	= 3

Task 2 ACTIVITY 2



1. Circle the greater fraction. Use the fraction wall to help.

$\frac{1}{9}$ or $\frac{1}{7}$	$\frac{7}{10}$ or $\frac{7}{9}$	$\frac{3}{4}$ or $\frac{7}{8}$	$\frac{7}{8}$ or $\frac{5}{6}$	$\frac{2}{3}$ or $\frac{5}{7}$

2. Write each group of fractions in order from smallest to largest.

$\frac{1}{5}$ $\frac{1}{9}$ $\frac{1}{8}$ $\frac{1}{9}; \frac{1}{8}; \frac{1}{5}$	$\frac{2}{5}$ $\frac{2}{9}$ $\frac{2}{7}$ $\frac{2}{9}; \frac{2}{7}; \frac{2}{5}$	$\frac{5}{6}$ $\frac{9}{10}$ $\frac{7}{8}$ $\frac{5}{6}; \frac{7}{8}; \frac{9}{10}$
$\frac{3}{4}$ $\frac{2}{3}$ $\frac{1}{2}$ $\frac{1}{2}; \frac{2}{3}; \frac{1}{2}$	$\frac{3}{8}$ $\frac{1}{3}$ $\frac{3}{10}$ $\frac{1}{3}; \frac{3}{10}; \frac{1}{3}$	$\frac{3}{5}$ $\frac{3}{4}$ $\frac{5}{9}$ $\frac{5}{9}; \frac{3}{5}; \frac{3}{4}$

Task 2: ACTIVITY 3

Work out how many packages of chocolate you would need to buy for each weight in the table.

500 g

200 g

100 g

1 kg	2		
$1\frac{1}{2}$ kg			
$2\frac{1}{2}$ kg			

List what you would buy to get the exact amount of chocolate in the Rocky Road recipe

.....

.....

ROCKY ROAD

800g chocolate, melted

600g raspberry jellies

100g peanuts (unsalted)

50 g marshmallows, chopped

Answer these questions to double the Rocky Road recipe

List the packages of chocolate you would buy.	How many 150g packets of raspberry jellies would you need?
How many grams of peanuts would be left over from a $\frac{1}{4}$ kg packet?	What fraction of a kilogram, more or less than $1\frac{1}{2}$ kg, is the amount of chocolate you need?

Task 2: ACTIVITY 4

Work out how many packages of chocolate you would need to buy for each weight in the table.

	500 g	250 g	100g
1 kg	2	4	10
$1\frac{1}{2}$ kg	3	6	15
$2\frac{1}{2}$ kg	5	10	25

List what you would buy to get the exact amount of chocolate in the Rocky Road recipe

1 × 500 g + 3 × 100 g

ROCKY ROAD

800g chocolate, melted

600g raspberry jellies

100g peanuts (unsalted)

50 g marshmallows, chopped

Answer these questions to double the Rocky Road recipe

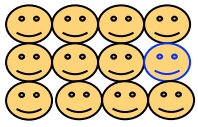
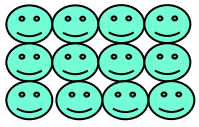
List the packages of chocolate you would buy.	How many 150g packets of raspberry jellies would you need?
Double: 1600 g Packages: 3 × 500 g + 1 × 100 g	Double: 1200 g Packages: 8
How many grams of peanuts would be left over	What fraction of a kilogram, more or less than

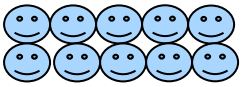
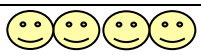
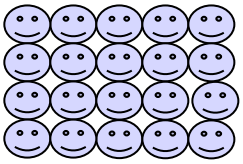
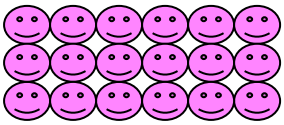
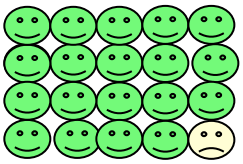
from a $\frac{1}{4}$ kg packet? *Double: 200 g* *Left over: 250 g – 200 g = 50 g*	$1\frac{1}{2}$ kg, is the amount of chocolate you need? *Double: 1600 g* *More chocolate are needed: 1,6 kg – 1,5 kg* *= 0,1 kg* *= 100g*

Task 3 (FRACTIONS)

Worksheet Activity 1

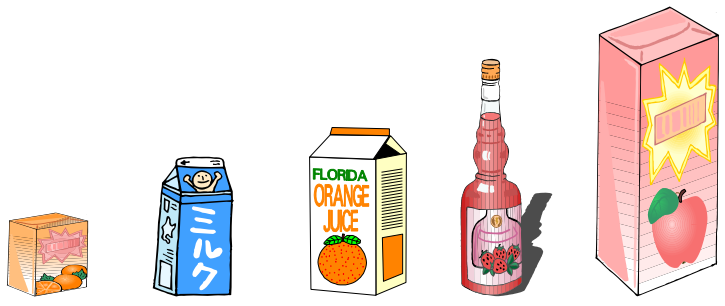
Cross cubes on the tray to show the fraction.
Complete the fraction sentence.
Write the division sentence that helps you to find the answer.

 $\frac{1}{4}$ of 12 is ..... 12 ÷ 4 = ...	 $\frac{1}{3}$ of 12 is ....
	

 $\frac{1}{3}$ of 15 is	 $\frac{1}{4}$ of 8 is ....
 $\frac{1}{2}$ of 18 is	 $\frac{1}{4}$ of 20 is ....
 $\frac{1}{3}$ of 18 is	 $\frac{1}{5}$ of 20 is ....

Task 3: ACTIVITY 2

Make ticks (√) in the table to show each combination.



	200ml	250 ml	300 ml	500 ml	750 ml
2 different juices that make $\frac{1}{2}$ litre altogether	√		√		

2 different juices that make 1 litre altogether					
2 different juices that make $\frac{3}{4}$ litre altogether					
3 different juices that make 1 litre altogether					
3 different juices that make $1\frac{1}{2}$ litre altogether					
4 different juices that make $1\frac{1}{4}$ litre altogether					
3 different juices that make $1\frac{3}{4}$ litre altogether					

For these problems, write an answer for each juice.

How much less than 1 litre in the container?	800 ml				
How many times could the container fill a 50 ml measure?	4				
How many containers make $1\frac{1}{2}$ litres?	$7\frac{1}{2}$				

Task 3: ACTIVITY 3

Make ticks (√) in the table to show each combination.

	200 ml	250 ml	300 ml	500 ml	750 ml
2 different juices that make $\frac{1}{2}$ litre altogether	√		√		
2 different juices that make 1 litre altogether		√			√
2 different juices that make $\frac{3}{4}$ litre altogether		√		√	
3 different juices that make 1 litre altogether	√		√	√	
3 different juices that make $1\frac{1}{2}$ litre altogether		√		√	√
4 different juices that make $1\frac{1}{4}$	√	√	√	√	

litre altogether					
3 different juices that make $1\frac{3}{4}$ litre altogether	√		√		√

For these problems, write an answer for each juice.

How much less than 1 litre in the container?	800 ml	750 ml	700 ml	500 ml	250ml
How many times could the container fill a 50 ml measure?	4	15	14	10	5
How many containers make $1\frac{1}{2}$ litres?	$7\frac{1}{2}$	2	2	3	6

Task 3: ACTIVITY 4

Addition of Fractions:

1. Add the following and write the answers in the simplest form:

(a) $\frac{2}{3}+\frac{5}{6}$

(b) $\frac{4}{7}+\frac{10}{14}$

(c) $\frac{9}{15}+\frac{7}{30}$

(d) $2\frac{1}{3}+\frac{5}{6}$

(e) $1\frac{1}{2}+3\frac{1}{4}$

(f) $4\frac{1}{8}+1\frac{3}{4}$

(g) $12\frac{1}{4}+6\frac{1}{2}$

(h) $3\frac{4}{7}+2\frac{3}{14}$

2. Determine the sum of the following numbers in the simplest form:

(a) $2\frac{1}{6}+3\frac{5}{24}+5$

(b) $16\frac{1}{2}+3\frac{3}{4}$

(c) $5\frac{2}{3}+13\frac{5}{6}$

(d) $15\frac{2}{3}+4\frac{7}{12}$

(e) $28\frac{1}{4}+7\frac{3}{8}$

(Work in groups of three)

3. Why don't we add the denominators when adding the fractions? Discuss this in your groups and explain to one another. Write down the reason(s).

(Work in pairs)

4. Write the following as improper fractions and determine the sum.

(a) $1\frac{2}{3}+3\frac{1}{3}$

(b) $4\frac{1}{5}+7\frac{3}{5}$

(c) $8\frac{1}{2}+4\frac{1}{2}$

(d) $9\frac{2}{3} + 2\frac{1}{3}$

5. As the demand for the special cards is so great, Petra and John have to work on the cards every day. On Thursday they work $2\frac{3}{4}$ hours, on Friday $3\frac{5}{8}$ hours and Saturday $2\frac{7}{8}$ hours. How long did they work in total?

6. Complete the following activity:

(a) Add the following fractions and write the answer in the simplest form:

(i) $\frac{2}{7} + \frac{6}{7} + \frac{5}{7} + \frac{1}{7}$

(ii) $\frac{1}{3} + \frac{2}{3} + \frac{4}{3} + \frac{10}{3}$

(iii) $2\frac{1}{3} + 1\frac{2}{3} + 4\frac{2}{3}$

(iv) $2\frac{5}{12} + 3\frac{7}{12} + \frac{11}{12}$

(v) $\frac{4}{5} + 2\frac{3}{5} + 12\frac{1}{5} + \frac{8}{10}$

(vi) $5\frac{1}{5} + 3\frac{4}{10}$

(vii) $15\frac{2}{5} + 4\frac{1}{20}$

(viii) $12\frac{1}{4} + 9\frac{1}{3}$

Subtraction of Common Fractions:

1. Calculate:

(a) $12\frac{4}{5} - 6\frac{2}{5}$

(b) $8\frac{1}{2} - 6\frac{1}{2}$

(c) $6\frac{2}{5} - 4\frac{1}{5}$

(d) $2\frac{3}{5} - \frac{4}{5}$

(e) $8\frac{1}{4} - \frac{3}{4}$

(f) $6\frac{2}{5} - 4\frac{3}{5}$

(g) $5\frac{3}{5} + 2\frac{1}{5} - \frac{4}{5}$

(h) $2\frac{4}{7} + 3\frac{5}{7} - 3\frac{2}{7}$

(i) $6\frac{2}{3} + 5\frac{2}{3} - 4\frac{1}{3}$

2. Calculate the following. First do the operations in brackets.

(a) $\left(\frac{7}{8}-\frac{3}{8}\right)-\frac{1}{8}$

(b) $\left(\frac{7}{12}-\frac{5}{12}\right)-\frac{1}{12}$

(c) $\left(\frac{10}{12}-\frac{3}{12}\right)-\frac{1}{6}$

(d) $\frac{4}{7}-\left(\frac{13}{14}-\frac{10}{14}\right)$

(e) $\frac{9}{15}-\left(\frac{6}{15}-\frac{2}{15}\right)$

(f) $\frac{8}{10}+\left(\frac{6}{10}-\frac{3}{20}\right)$

3. From a piece of cardboard that is $29\frac{3}{4}$ cm long, John cuts two pieces to make cards. The one piece is $12\frac{1}{8}$ cm long and the other piece is $9\frac{1}{4}$ cm long. How long is the piece of cardboard that remains? Give your answer in the simplest form.

4. John makes a triangular card. Determine the circumference of the triangular card of which the sides are $12\frac{1}{5}$ cm, $13\frac{1}{2}$ cm and $14\frac{3}{10}$ cm.

5. John bought yellow cardboard of which he only needs $\frac{5}{8}$. What part of the cardboard should he cut off? Later John realises that he only used one third of the cardboard. Which part of the original cardboard remained?

Task 3: ACTIVITY 5

1. Calculate the following and write the answer in the simplest form:

(a) $3 \times \frac{1}{2}$ (b) $3 \times \frac{3}{4}$ (c) $4 \times \frac{3}{5}$

(d) $\frac{5}{6} \times 8$ (e) $\frac{7}{8} \times 6$ (f) $7 \times 1\frac{1}{2}$

(g) $4 \times 3\frac{1}{3}$ (h) $3 \times 5\frac{3}{5}$ (i) $2\frac{4}{5} \times 3$

(j) $6\frac{2}{3} \times 1\frac{1}{5}$ (k) $3\frac{1}{8} \times 2\frac{2}{5}$ (l) $4\frac{1}{4} \times 4\frac{2}{5}$

(m) $3\frac{3}{4} \times 1\frac{3}{7} \times 5\frac{5}{6}$ (n) $3\frac{1}{3} \times 4\frac{2}{5} \times 1\frac{1}{4}$ (o) $2\frac{1}{3} \times \frac{4}{3} \times 3\frac{3}{4}$

2. John can make $12\frac{1}{2}$ cards in one day. How many cards can he make in one week?

3. John owns 12 books on card design. Two thirds of the books were gifts.

(a) How many of the books were gifts?

(b) How many books did John buy?

4. The flour for Petra's biscuits is finished. She buys another $3\frac{3}{4}$ kg flour. She needs half of the flour for the mixture she is making. Which fraction of the flour should she use? Write $\frac{1}{2}$ kg as a fraction of $3\frac{3}{4}$ kg.

Task 3: ACTIVITY 6

Division of Fractions:

1. Calculate the following and write the answer in the simplest form.

(a) $\frac{3}{5} \div 3$ (b) $\frac{3}{5} \div 6$ (c) $\frac{9}{10} \div 6$

(d) $\frac{12}{5} \div 8$ (e) $2\frac{2}{5} \div 8$ (f) $3\frac{3}{4} \div 10$

(g) $3\frac{1}{7} \div \frac{11}{2}$ (h) $\frac{25}{6} \div \frac{5}{2}$ (i) $\frac{35}{12} \div \frac{14}{3}$

(j) $\frac{45}{8} \div \frac{14}{4}$ (k) $4\frac{1}{5} \div \frac{9}{10}$ (l) $2\frac{2}{5} \div 2\frac{1}{4}$

(m) $5\frac{1}{3} \div 4\frac{4}{5}$ (n) $7\frac{1}{5} \div 2\frac{7}{10} \times 5\frac{1}{3}$ (o) $6\frac{2}{9} \div 8\frac{1}{6} \div 2\frac{2}{7}$

(p) $3\frac{3}{4} \times 4\frac{2}{3} \div 2\frac{2}{7}$

2. John has 1,5 m ribbon that he has to divide equally between 9 cards. How much will he have for each card?

3. John has 24 different colour gummed paper in his cupboard. He calculates that he needs $2\frac{2}{3}$ papers to make one card. How many cards can he make?

4. John also uses paint. Petra helps him paint. John paints a fifth and Petra paints a quarter of each card. Which section of each card have they painted? Which section still remain.

Task 4 Learner Worksheet Activity 1

DECIMALS

Introduction: Place value, ordering and comparing decimals

Introduce the lesson by asking what a decimal fraction is. Write 4,236 on the **board**.

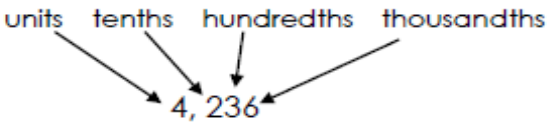
Tell learners that in South Africa we make use of a decimal comma.

Note that we can also say decimal **number**

Concept development

Revise place value of decimal fractions with your learners.

Use your example on the **board** and label the decimal fraction.



Ask learners to write the decimal fraction in expanded notation:

4, 236 = 4 + 0,2 + 0,03 + 0,006

1. Write the following in expanded notation:

Example: 3,785

= 3 + 0,7 + 0,08 + 0,005

a. 4,378 b. 5,213 c. 14,678

d. 5,036 e. 8,305 f. 9,006

g. 14,002 h. 18,060 i. 29,002

j. 100,001

k. Show this using your calculator, e.g. 4 + 0,3 + 0,07 + 0,008

2. Write the following in words:

Example: 4,326

= 4 units + 3 tenths + 2 hundredths + 6 thousandths

a. 5,376 b. 8,291 c. 3,589

d. 7,036 e. 8,005 f. 19,060

g. 28,001 h. 200,202 i. 3,999

j. 35,024 k. Use a calculator to check your answers.

3. Write the following in the correct column:

		thousands	hundreds	tens	units		tenths	hundredths	thousandths
a.	4,765				4	,	7	6	5
b.	18,346					,			
c.	19,005					,			
d.	231, 04					,			
e.	7685,2					,			
f.	3676,289					,			
g.	234,002					,			
h.	200,05					,			
i.	1000,101					,			

4. Write down the value of the underlined digit:

Example: 3,7<u>8</u>4

= 0,08 or 8 hundredths

a. 6,<u>3</u>57 b. 4,3<u>2</u> c. <u>5</u>,809

d. 8,9<u>9</u>9 e. 8<u>8</u>,080 f. 34,00<u>2</u>

5. Write the following in ascending order:

a. 0,04; 0,4; 0,004
b. 0,1; 0,11; 0,011
c. 0,99; 0,9; 0,999
d. 0,753; 0,8; 0,82
e. 0,67; 0,007; 0,06
f. 0,899; 0,98; 0,99
g. 0,202; 0,2; 0,22
h. 0,345; 0,45; 0,5
i. 0,003; 0,033; 0,030
j. 0,702; 0,72; 0,072

6. Fill in <, >, =

a. 0,4 ___ 0,04
b. 0,05 ___ 0,005
c. 0,1 ___ 0,10
d. 0,62 ___ 0,26
e. 0,58 ___ 0,85
f. 0,37 ___ 0,73
g. 0,123 ___ 0,321
h. 0,2 ___ 0,20
i. 0,4 ___ 0,40
j. 0,05 ___ 0,050

Task 4 Learner Worksheet Activity 2

1. Draw place value columns in order to place the following numbers in correct columns:
   a) 2, 9
   b) 82, 747
   c) 200, 4
   d) 841, 6

2. Write these numbers in ascending order:
   a) 0,7 ; 0,6 ; 0,8 ; 0,9 ; 0,2
   b) 1,7 ; 2,7; 0,7 ; 4,9 ; 5

3. Write these numbers in descending order:
   a) 76,391 ; 76,396 ; 76,390 ; 76,298; 76,392

   b) 4,999; 0,999; 2,999; 3,999; 8,999

4. Fill in > or < :
   a) 0,006 ___ 0,004
   b) 0,033 ___ 0,093
   c) 2,4 ___ 2,399
   d) 2,7 ___ 7,2

Task 4 Learner Worksheet Activity 3

A. Round off the following decimals to the nearest 100^{th} :

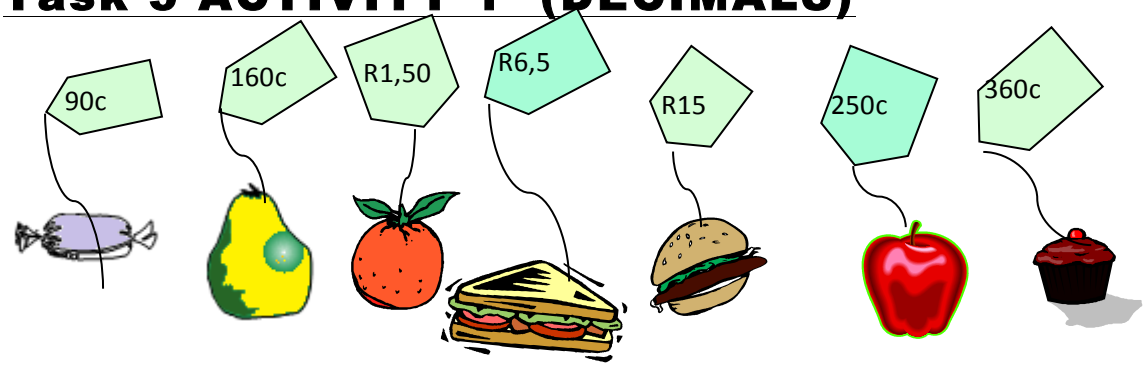
a) 45
b) 50
c) 70

B. Round off the following numbers to the nearest whole number:
a) 4, 38
b) 9,915
c) 0,3012
d) 123,56
e) 35,47
f) 30,06
g) 451,14
h) 7,698
i) 12,545
j) 0,123
C. Round off the numbers in B to one decimal place:

D. Which numbers are halfway between:

1. 3,9 and 4,0
2. 4,63 and 4,64
3. 0,6 and 0,61
4. 7,6 and 7,7
5. 5,85 and 5,89

Task 5 ACTIVITY 1 (DECIMALS)



Solve these problems:

Determine the cost of 3  and 3 	What is the cost of  3 and 2  ?
How much change will you get from R10 if you buy  and  ?	Calculate the cost of 2  and 2 
How many  can you buy with R2?	If you had R25, how much would you have left after paying for the following:   

Draw the lunch you would buy for a family of 2 adults and 2 children with R100 to spend.

What is the total cost? ..... How much change would you get? .....

Task 5 ACTIVITY 2

Calculate the cost of one CD in each of these packs.

5 CD's R375	5 CD's R 520
4 CD's R325	2 CD's R 155
10 CD's R745	5 CD's R445
4 CD's R435	4 CD's R 280

Task 5 Learner Worksheet Activity 3

1. **Simplify**

a. 7,463 x 10

b. 0,279 x 10

c. 0,029 x 10

d. 0,006 x 10

e. 4,267 x 100

f. 0,285 x 100

g 0,063 x 100

h. 0,08 x 100

2. Calculate the following and show all your workings.

a. 4 x 0,3
b. 0,6 x 4
c. 5 x 0,3
d. 8 x 0,6
e. 0,7 x 7
f. 0,7 x 2
g. 5 x 0,07
h. 7 x 0,03
i. 8 x 0,02

Task 5 Learner Worksheet Activity 4

Use a calculator to find the answers:

1.

a. 1,7 x 4,3
b. 2,9 x 8,4
c. 7,6 x 9,3
d. 8,4 x 0,7
e. 1,9 x 2,6
f. 0,9 x 3,8

2. Simplify without using the calculator

a. 0,2 x 0,7
b. 0,2 x 0,4
c. 0,3 x 0,3
d. 0,6 x 0,6
e. 0,5 x 0,3
f. 0,9 x 0,4
g. 0,2 x 0,8
h. 0,7 x 0,7

3. Calculate the following:

a. 46,9 ÷ 10

b. 729,6 ÷ 10

c. 274,3 ÷100

d. 12,4 ÷ 100

e. 9,275 ÷ 5

f. 16,38 ÷ 7

4 . Fill in the missing numbers

a. 0,4 x 20 = 0,4 x……x 10=…….

b. 0,5 x 30 = 0,5 x 3 x…….=……

c. 0,5 x 500 = 0,5 x……..x 100 =…….

d. 3,796 ÷ 20 = 3,796 ÷……..÷ 2 = 0,198

a. 42,658 ÷ 10 = ……

e. 72,75 ÷ 50 = 72,75 ÷ 10 =…….÷ 5 =……

TASK 5 ACTIVITY 5

Highlight the correct answer:

QUESTIONS		A	B	C	D
1	0,3 × 0,2	0,6	0,06	0,006	0,0006
2	0,3 × 0,4	0,0012	0,012	0,12	1,2
3	0,5 × 0,01	0,005	0,05	0,5	0,0005
4	0,06 × 0,03	0,18	0,018	0,0018	0,00018
5	0,05 × 0,04	0,2	0,02	0,0002	0,002
6	1,01 × 0,03	3,03	0,303	0,03	0,3
7	0,005 × 0,06	0,0003	0,003	0,0303	0,33
8	$0,04^2$	0,16	0,08	0,0016	0,0008
9	0,0028 ÷ 4	0,7	0,07	0,007	0,0007
10	0,00054 ÷ 6	0,00009	0,0009	0,009	0,09
11	0,24 ÷ 2	0,3	0,003	3	0,03
12	0,0015 ÷ 3	0,0005	0,05	0,5	0,005
13	0,004 ÷ 8	0,2	0,02	0,0002	0,002
14	0,2 × 0,6 ÷ 4	3	0,3	0,03	0,003
15	0,05 × 0,4 ÷ 2	0,001	0,1	0,01	10

TASK 6 Learner Worksheet Activity 1 :

PERCENTAGE

1. Write the following as percentages:

(a) $\frac{4}{100}$ (b) $\frac{25}{100}$

(c) $\frac{30}{100}$ (d) $\frac{40}{100}$

(e) $\frac{1}{100}$ (f) $\frac{90}{100}$

(g) $\frac{9}{100}$ (h) $\frac{50}{100}$

2. Write the following percentages as common fractions:

(a) 5% (b) 25% (c) 1% (d) 50%

(e) 80% (f) 100%

3. How much is sold if 100% is sold?

4. Your teacher will hand out Worksheet 2.5. The following is an example of the worksheet:

(a) Write the following as percentages:

(i) $\frac{30}{100}$ (ii) $\frac{57}{100}$

(iii) $\frac{108}{100}$ (iv) $\frac{5}{100}$

(v) $\frac{15}{100}$ (vi) $\frac{128}{100}$

(b) Write the following as percentages:

(i) $\frac{17}{50}$ (ii) $\frac{4}{20}$

(iii) $\frac{18}{25}$ (iv) $\frac{5}{2}$

(v) $1\frac{1}{2}$ (vi) $\frac{2}{5}$

(vii) $\frac{1}{100}$ (viii) $\frac{1}{10}$

(ix) $\frac{6}{12}$ (x) $\frac{1}{12}$

(xi) $\frac{12}{15}$ (xii) $\frac{13}{15}$

(c) Convert the following percentages to common fractions (remember to simplify the answer):

(i) 36% (ii) 6%

(iii) 65% (iv) 97%

(v) 1% (vi) 10,5%

(**Individual**)

(d) Write the following percentages as fractions in their simplest form:

(i) $5\frac{1}{2}\%$ (ii) $6\frac{1}{4}\%$

(iii) $87\frac{1}{2}\%$ (iv) $27\frac{1}{3}\%$

(v) $\frac{1}{2}\%$ (vi) $5\frac{3}{4}\%$

5. Write the following common fractions as percentages:

(a) $\frac{4}{50}$ (b) $\frac{25}{50}$

(c) $\frac{30}{50}$ (d) $\frac{40}{50}$

(e) $\frac{1}{25}$ (f) $\frac{18}{50}$

(g) $\frac{9}{25}$ (h) $\frac{50}{50}$

6. Write the following as percentages:

(a) $\frac{4}{10}$ (b) $\frac{2}{5}$

(c) $\frac{3}{4}$ (d) $\frac{4}{20}$

(e) $\frac{1}{2}$ (f) $\frac{3}{5}$

(g) $\frac{9}{20}$ (h) $\frac{40}{40}$

7. Complete the following activity:

(a) Convert the following percentages to common fractions in the simplest form.

(i) 10%

(ii) 40%

(iii) 5%

(iv) 60%

(v) $2\frac{1}{2}\%$

(vi) $3\frac{3}{4}\%$

(vii) $\frac{1}{2}\%$

(viii) $\frac{1}{4}\%$

(ix) $\frac{3}{8}\%$

(x) 95%

(b) Convert the following to decimal fractions:

(i) 10%

(ii) 15%

(iii) 85%

(iv) 12%

(v) $62\frac{1}{2}\%$

(vi) $8\frac{1}{3}\%$

(vii) $4\frac{1}{4}\%$

(c) In newspapers and magazines the word “percentage” is often used as well as the “%” sign.

(i) Collect these articles and cut them out for discussion in your groups.

(ii) Explain what the concept percentage means in each of the pieces you have cut out, e.g. increasing, decreasing.

(iii) Make a poster out of your cut-outs.

8. Complete the following activity:

(Individual)

(a) What percentage is:

(i) 20 of 100?
(ii) 5 of 60?

(iii) 8 of 40?

(iv) 15 of 15?

(v) 9 of 27?

(vi) 20 of 300?

(vii) 90 of 150?

(viii) 51 of 75?

(b) What percentage is:

(i) 15c of R6,00?

(ii) 15c of R1,25?

(iii) R1,10 of R4,40?

(iv) 15 minutes of $1\frac{1}{2}$ hours?

(v) $\frac{3}{4}$ of an hour of $6\frac{1}{4}$ hours?

(c) The ASB cellphone company advertises in the following manner in the daily pages: A Mampodi III cellphone @ R60,00 per month for 24 months. 85 minutes in off-peak time and 15 minutes in peak time are included in the price. Additional costs:

- R20,00 per month for specified billing.
- Sim-card: R114,00 (once-off)

(i) What percentage of the free minutes can be used during peak time?

(ii) What percentage of the free minutes can be used during off-peak time?

(iii) What percentage of each month's compulsory payment is spent on additional costs?

(iv) What will the total expense be during a 2 year period?

(d) Harry has 56 pigeons. He sells 14 of them. What percentage of his pigeons did he sell?

(e) A chicken farmer orders 2 500 chicks. He only receives 2 100. What percentage of his order did he receive?

(f) The book that Lucy is reading has 120 pages. She has already read 72 pages. What percentage of the pages has she already read?

(g) Sandra achieved the following marks in her tests:

English:	150 out of 200
Afrikaans:	90 out of 150
Mathematics:	105 out of 150
Geography:	45 out of 60
Business Studies:	42 out of 60
Biology:	34 out of 40
Natural Sciences:	32 out of 40

(i) Calculate the percentage that she achieved in each learning area.

(ii) How many marks did she get out of 700?

(iii) Calculate her percentage out of 700.

(h) What percentage does your Grade 7 group represent out of the total number of learners in your school?

9. Complete the following activity:

(a) Calculate:

(i) 25% of 60 (ii) 80% of 70

(iii) 60% of 810 (iv) 40% of 350

(v) $3\frac{1}{3}$% of 120 (vi) $6\frac{2}{3}$% of R400

(vii) $2\frac{1}{2}$% of 50 (viii) 90% of R800

(b) Calculate (a calculator is permitted):

(i) 6% of 1 200 cars (ii) 12% of 820 kg

(iii) 100% of 560 men (iv) 65% of R725,00

(v) 10% of R1,00 (vi) 72% of R118,00

(c) Write down the answer:

(i) 15% of R1,00

(ii) 12% of R1,00

(iii) 18% of R10,00

(iv) 25% of R10,00

(v) 1% of R100,00

(vi) 10% of R100,00

(vii) 100% of R10,00

(viii) 35% of R1 000,00

(d) Dave sells 10% of his pigeons. How many pigeons does he sell?

(e) William got 75% of his 20 math problems correct. How many were correct?

(f) Billy sees an advertisement for a remote control car that he really wants. It costs R450. He only has 90% of the amount. How much money does he have? What amount does he need?

TASK 7 ACTIVITY 1 (EXPONENTS)

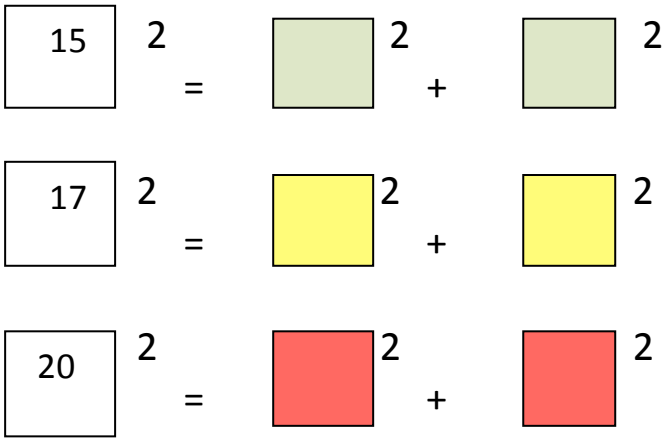
The squares of certain numbers are the sum of two other squares.
The best such example known, is:

$$5^2 = 4^2 + 3^2$$

These five numbers have the same property.
Complete these patterns.

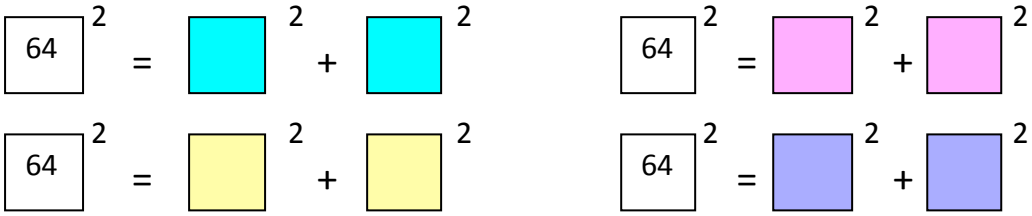
$$10^2 = \square^2 + \square^2$$

$$13^2 = \square^2 + \square^2$$



The number 25 can be reached in two different ways. Find both.

The number 64 can be reached in four different ways. Find all four



Introduction: Square roots

Draw the diagram on the **board**. Introduce the topic by showing the diagram. Ask them: What do you think this diagram represents?

Write down the square root and ask the learners how this links to the square number.

1	2	3
4	5	6
7	8	9

$\sqrt{9}$ Introduce the square root symbol.

3 x 3 = 9, so the square root of 9 is 3.

Concept development

Write the following on the **board**.

Solve the sum step by step with your learners on the board.

$\sqrt{9}$

$= \sqrt{3 \times 3}$

$= 3$

Can we replace "3 x 3" with 3^2 under the square root? Why?

Do a few more examples like this on the **board**.

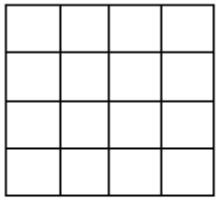
1. What square number and root does the diagram represent?

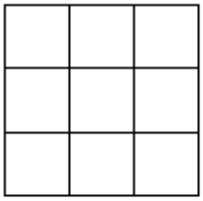
Use the example to guide you.

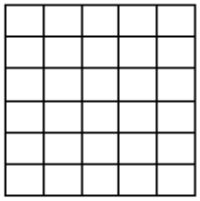
1	2	3
4	5	6
7	8	9

Example: 3 x 3 = 9, so the square root of 9 is 3.

$\sqrt{9}$

a 

b 

c 

2. Write the following in symbols:

a. The square root of 9

b. The square root of 25

c. The square root of 81

d. The square root of 100

e. The square root of 36

3. Calculate the square root:

Example: $\sqrt{9}$

$= \sqrt{3 \times 3}$

= 3

a. $\sqrt{9}$ b. $\sqrt{1}$ c. $\sqrt{121}$

d. $\sqrt{81}$ e. $\sqrt{36}$ f. $\sqrt{169}$

g. $\sqrt{64}$ h. $\sqrt{100}$ i. $\sqrt{49}$

j. $\sqrt{144}$

1. Write the following in ascending order.

a. $\sqrt{16}, \sqrt{4}, \sqrt{25}, \sqrt{9}, \sqrt{36}$
b. $\sqrt{100}, \sqrt{144}, \sqrt{81}, \sqrt{121}, \sqrt{64}$
c. $\sqrt{25}, \sqrt{49}, \sqrt{4}, \sqrt{64}, \sqrt{36}$
d. $\sqrt{9}, \sqrt{25}, \sqrt{64}, \sqrt{81}, \sqrt{36}$
e. $\sqrt{49}, \sqrt{1}, \sqrt{9}, \sqrt{144}, \sqrt{121}$

2. Write the following in ascending order.

a. $\sqrt{4.4}, \sqrt{3.3}, \sqrt{2.2}$
b. $\sqrt{5.5}, \sqrt{4.4}, \sqrt{6.6}$
c. $\sqrt{2.2}, \sqrt{5.5}, \sqrt{7.7}$
d. $\sqrt{10.10}, \sqrt{6.6}, \sqrt{8.8}$
e. $\sqrt{9.9}, \sqrt{11.11}, \sqrt{4.4}$

3. Write the following in descending order.

a. $\sqrt{25}, 2^2, \sqrt{16}, \sqrt{100}, 9^2$
b. $\sqrt{36}, 11^2, \sqrt{100}, 3^2, \sqrt{16}$
c. $4^2, \sqrt{131}, \sqrt{9}, 7^2, \sqrt{81}$
d. $12^2, \sqrt{49}, 5^2, \sqrt{144}, 8^2$
e. $6^2, \sqrt{64}, \sqrt{16}, \sqrt{81}, 10^2$

4. Fill in <, > or = .

a. $\sqrt{36}$ ___ $\sqrt{25}$
b. $\sqrt{81}$ ___ $\sqrt{27}$
c. $\sqrt{9}$ ___ $\sqrt{16}$
d. $\sqrt{2.2}$ ___ $\sqrt{3.3}$
e. $\sqrt{4.4}$ ___ $\sqrt{16}$
f. $\sqrt{9}$ ___ $\sqrt{3.3}$

5. Fill in <, > or =

a. $\sqrt{81}$ ___ 3^2

b. 3^2 ___ $\sqrt{36}$

c. 4^2 ___ $\sqrt{25}$

d. $\sqrt{81}$ ___ 9^2

e. $\sqrt{16}$ ___ 2^2

f. 4^2 ___ $\sqrt{4}$

g. 3^2 ___ $\sqrt{9}$

h. $\sqrt{121}$ ___ 12^2

i. $\sqrt{100}$ ___ 10

j. $\sqrt{144}$ ___ 11^2

TASK 7 Learner Worksheet Activity 2

(a) Complete the following (use a calculator to confirm your answers):

(i) 1^3 =

(ii) 11^2 =

(iii) 11^3 =

(iv) 28^3 =

(v) 100^3 =

(b) Seeing the square of 5 can be written as 5^2 = 25, we say that the square root of 25 = 5. We write it as $\sqrt{25}$ = 5.

(i) 4^2 = 16 and therefore the $\sqrt{16}$ =

(ii) 9^2 = 81 and therefore the $\sqrt{81}$ =

(iii) 1^2 = 1 and therefore the $\sqrt{1}$ =

(iv) 7^2 = 49 and therefore the $\sqrt{49}$ =

(v) 11^2 = 121 and therefore the $\sqrt{121}$ =

(c) Seeing the cube of 5 can be written as 5^3 = 125, we say that the cube root of 125 = 5. We write it as $\sqrt[3]{125}$ = 5.

(i) 4^3 = 64 and therefore the $\sqrt[3]{64}$ =

(ii) 9^3 = 729 and therefore the $\sqrt[3]{729}$ =

(iii) 1^3 = 1 and therefore the $\sqrt[3]{1}$ =

(iv) 7^3 = 343 and therefore the $\sqrt[3]{343}$ =

(v) 6^3 = 216 and therefore the $\sqrt[3]{216}$ =

(d) Fill in the missing numbers:

(i) 1; 4; 9; 16; _____; _____; _____

(ii) 8; 27; 64; _____; _____; _____;

(iii) $\sqrt{10\,000}$ =

TASK 7 Learner Worksheet Activity 3

(a) Complete the following :

(i) $\sqrt{-81}$ =

(ii) $\sqrt{-121}$ =

(iii) $\sqrt[3]{-343}$ =

Fill in the missing numbers:

(i) -1; - 4; - 9; -16; _____; _____; _____

(ii) -8; -27; -64; _____; _____; _____;

3. Calculate:

Example: $\sqrt[3]{125} + \sqrt{16}$

$= 5 + 4$

$= 9$

a. $\sqrt[3]{81} - \sqrt{25} =$

b. $\sqrt{16} + \sqrt[3]{8} =$

c. $\sqrt{25} + \sqrt[3]{8} =$

d. $\sqrt{25} - \sqrt[3]{27} =$

e. $\sqrt[3]{27} - \sqrt{4} =$

f. $\sqrt[3]{81} + \sqrt{81} =$

g. $\sqrt[3]{125} + \sqrt{25} =$

h. $\sqrt{144} - \sqrt[3]{125} =$

i. $\sqrt[3]{64} - \sqrt{64} =$

j. $\sqrt[3]{64} + \sqrt{64} =$

4. Calculate:

Example: $\sqrt[3]{27} + \sqrt[3]{3} - \sqrt{25}$

$= 3 + 9 - 5$

$= 7$

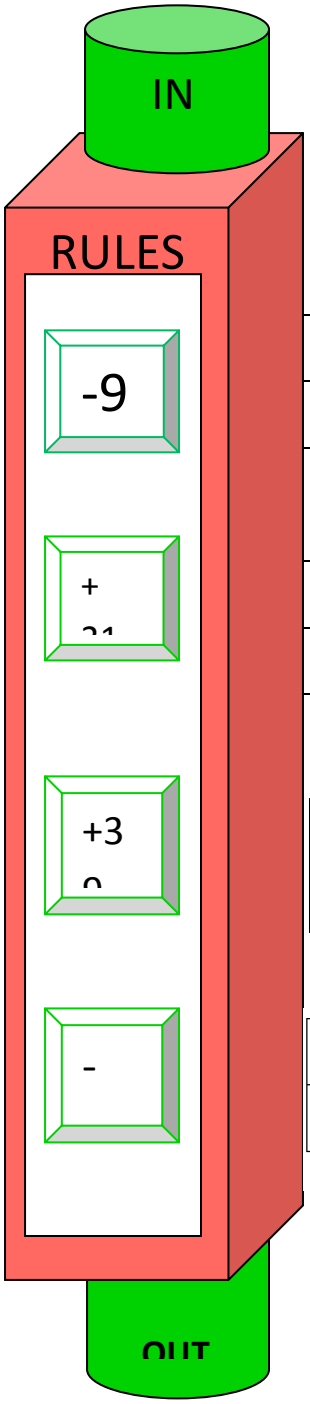
a. $\sqrt[3]{216} + 4^2 - \sqrt{16} =$

b. $9^2 - \sqrt[3]{27} + \sqrt{4} =$

c. $3^3 + 4^3 + \sqrt{25} =$

d. $\sqrt{144} - 2^2 + \sqrt[3]{8} =$

TASK 8 ACTIVITY 1



IN	24	31	19			
OUT				49	70	83

IN	37	53	70			
OUT				45	38	89

IN	15	27	41			
OUT				53	86	72

IN	39	53	72			
OUT				19	53	37

IN	38	59	23	54	62	18	59
OUT	59	88	51	33	43	50	78
RULE							

TASK 8 ACTIVITY 2

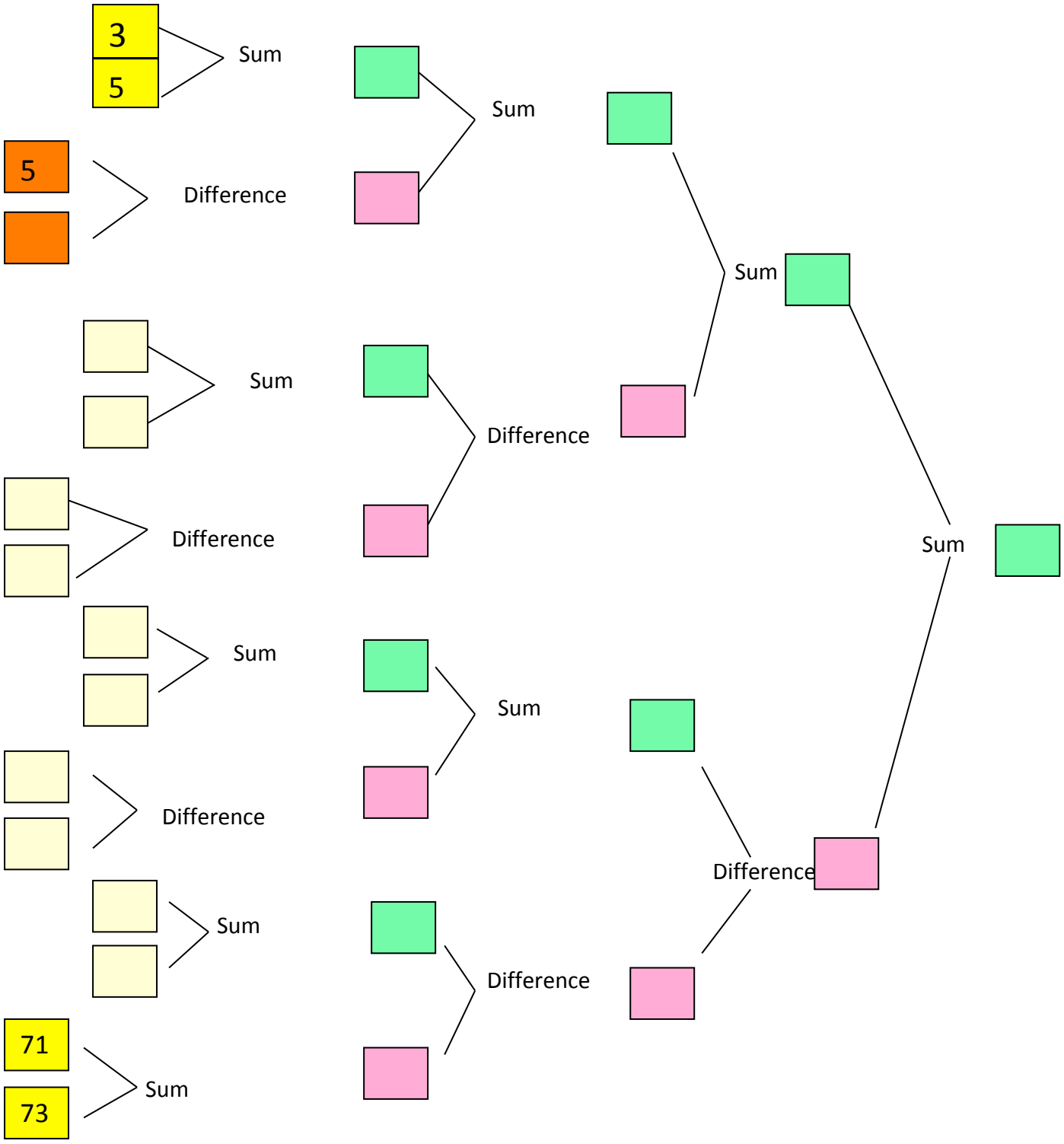
SUBSTITUTION

If p = 3, q = - 4, r = 5 and s = - 6, find the value of the following algebraic expressions and circle the correct answers.

QUESTIONS		A	B	C	D
1	$p - q + r + s$	-2	10	6	18
2	$4p + 2q + 3r$	35	19	5	11
3	$pr - qs$	-3	9	-5	-9
4	$p^2 + s^2$	45	-27	18	-6
5	$p^2 + q^2 - r^2$	-32	0	50	4
6	$2p^2 + 2q^2$	-14	100	-28	50
7	$3(q + r)^2$	54	243	3	6
8	$(5p + 3q)^2$	4	-9	38	9
9	qrs	-90	-120	90	120
10	$6p - qr$	38	70	110	93
11	$rs \div p$	10	8	-10	-8
12	$p^2q - pq^2$	48	12	-12	0
13	$r^2 + s^2 \div p^2$	$6\frac{7}{9}$	$-1\frac{2}{9}$	12	29
14	$(2s)^2 - 2s^2$	72	0	-48	216
15	$8r^2 - (5q)^2$	200	1200	-200	120

TASK 8 ACTIVITY 3

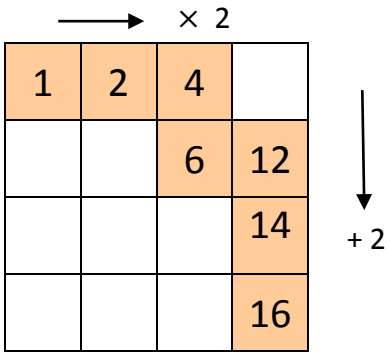
A *prime number pair* is two consecutive prime numbers which differ by 2. There are eight such number pairs less than 100. Complete the diagram:



TASK 8 ACTIVITY 4

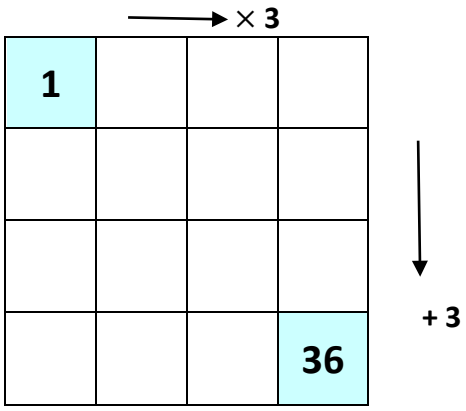
The puzzle here is to find a route through each of these grids from top left to bottom right.

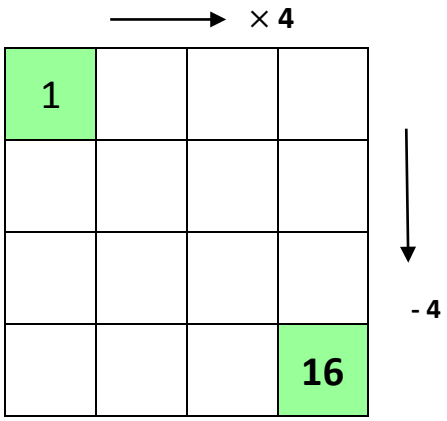
Whenever there is a shift to their right there is a multiplication.
Whenever there is a shift downwards There is an addition or subtraction.

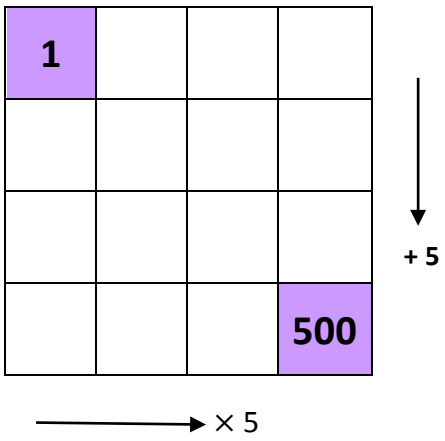


The example above shows a rout from 1 to 16

Now find the route for these three grids.



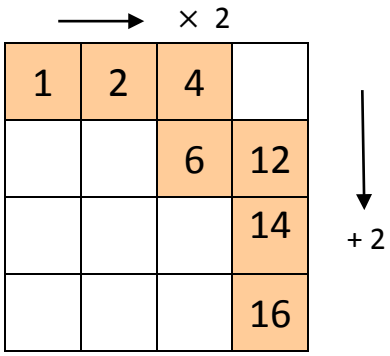




TASK 8 ACTIVITY 5

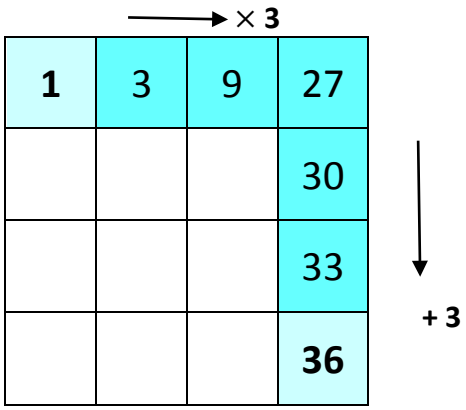
The puzzle here is to find a route through each of these grids from top left to bottom right.

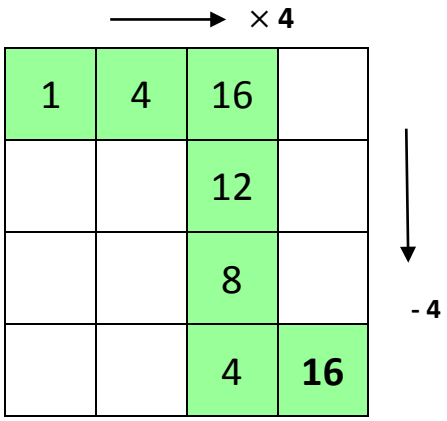
Whenever there is a shift to their right there is a multiplication.
Whenever there is a shift downwards There is an addition or subtraction.

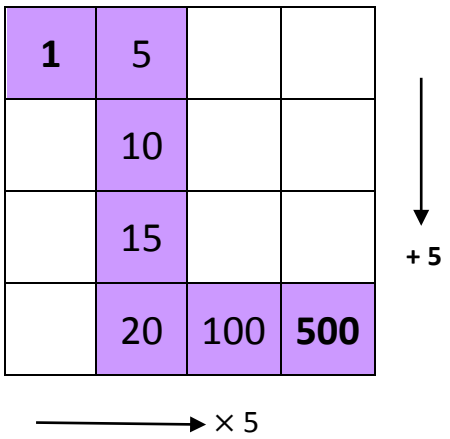


The example above shows a rout from 1 to 16

Now find the route for these three grids.





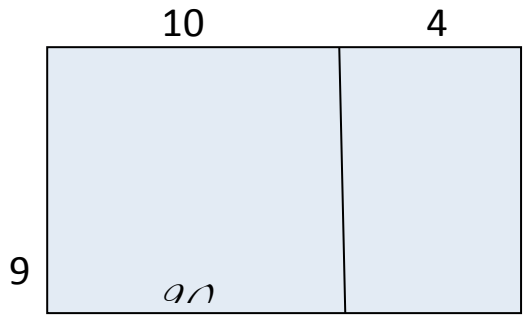


TASK 9 ACTIVITY 1

(Communicative, Associative Distributive Properties)

Use the pictures to help multiply.
Write the missing numbers to show each step.

9 × 14

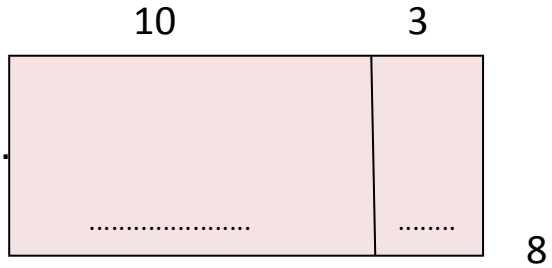


= (9 × 10) + (4 × 9)

= 90 + ...

= . . . . . .

8 × 13



= (8 × . . . . .)(8 × … … .

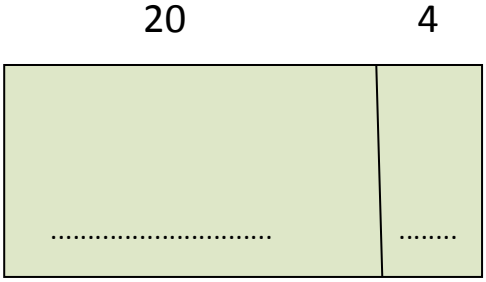
= . . . . . + ...

= .....

9 ×24

= (..... × .....) + (… … .× … … .)

= ..... + ...



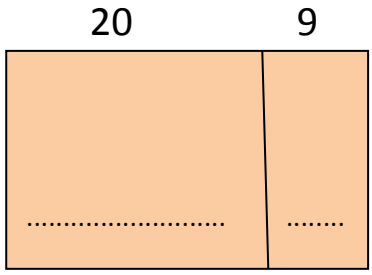
= .....

7×29

= (.....× ... ...) + (.....× .....)

= .....+ .....

= .....



TASK 9 Learner Worksheet Activity 2

Example exercises:

1. Use the commutative property to calculate:
   a) 167 + 12 = …… b) 12 + 167 = ….
   b) 7 x 6 = ….. d) 6 x 7 = ……
   c) 12 ÷ 3 = …. f) 3 ÷ 1 2 = ……
   d) 100 – 50 = ….. h) 50 - 100 = ….

2. Use the distributive property to calculate:

   a) 3 x (7 + 2) = …….=……..
   b) 5 x (3 + 7) = …….=……
   c) (3 x 7) + (3 x 2) = …….=…….
   d) (7 x 6) – (7 x 2) = …….= ……..

3. Use the associative property to calculate:
   a) 43 + (7 + 55)
   b) (43 + 7) + 55
   c) 25 x (4 x 8)
   d) (25 x 4) x 8

TASK 9 Learner Worksheet Activity 3

(a) Calculate the following by using two different methods:

i) $6 \times (2 + 5)$

(ii) $(8 + 4) \times 3$

(iii) $(7 + 4) \times 11$

(b) Use the distributive property to complete the following:

(i) $6 \times (2 + 5) = (6 \times \_\_) + (6 \times \_\_)$

ii) $\_\_ \times (8 + 13) = (5 \times 8) + (5 \times 13)$

(iii) $(8 \times 103) + (8 \times 78) = 8 \times (\_\_\_ + \_\_\_)$

(iv) $(42 \times 5) + (65 \times 5) = (42 + 65) \times \_\_\_$

(c) Place a = or ≠ symbol in each of the spaces to make the following true:

(i) $3 \times (16 – 4) \_\_\_ (3 \times 16) – (3 \times 4)$

(ii) $(12 – 5) \times 4 \_\_\_ (12 \times 4) – (5 \times 4)$

(iii) $8 \times (20 – 6) \_\_\_ (8 \times 20) – (8 \times 6)$

(d) Use the distributive property to calculate the following:

(i) $8 \times (7 – 4)$

(ii) $10 \times (12 – 5)$

(iii) $(8 – 2) \times 9$

(iv) $(14 – 9) \times 12$

(v) $(7 + 2 + 3) \times 8$

TASK 9 Learner Worksheet Activity 4

Learner do the following Classwork exercise:

1.

a) 14×0

(b) 0×28

(c) -6×0

(d) any number $\times 0$

(e) $25 \times \frac{0}{25}$

(f) $25 + 0$

(g) $25 \times \frac{16}{16}$

(h) $\frac{99}{99} + 99$

(i) $\frac{99}{99} + 98$

(j) $-16 + 0$

(k) $0 - 27$

(l) -27×1

(m) $0 \div 6$

(n) $15 \div 0$

(o) $\frac{0 \times 18}{6}$

2. What are the possible values of A?

(a) $0 \times A = 0$

(b) $0 + A = A$

(c) $1 \times A = A$

(d) $0 \times A = 5$

(e) $10 \times A = 1$

(f) $3 \times A = A \times 3$

(g) $\frac{1}{4} \times A = 1$

(h) $A + A = 0$

TASK 9 ACTIVITY 5

Simplify the expression and circle the correct answer.

QUESTION		A	B	C	D
1	$2 + 3 \times 4 - 5$	15	-5	9	-36
2	$24 \div 3 + 10^2$	108	1,1	28	8
3	$\sqrt{16 + 9}$	7	25	12	5
4	$(2)^3 \times 2$	12	16	4^3	8
5	$3 \times 12 + 2 \times 5$	22	210	46	190
6	$6 - 18 \div 3$	-4	0	4	undinfined
7	$2^0 + 15 \times 2$	31	34	32	30
8	$(4 + 9)^2$	25	13	169	26
9	$2 \times 3 - 24 \div 3$	-6	6	2	-2
10	$7^2 + 4 \times 3$	54	62	159	61

TASK 9 ACTIVITY 6

Simplify the expression and write the letter that matches the answer that differs from the other three in the last column.

	A	B	C	D	Answer
1	4×6	3×8	$\frac{1}{2}$ of 48	$15 + 8$	
2	3×12	16×2	9×4	6^2	
3	$8 + 8$	$20 - 4$	2×9	$80 \div 5$	
4	5^2	$\frac{1}{4}$ of 100	$32 - 7$	$19 + 7$	
5	8×8	15×4	3×20	$8^2 - 2^2$	
6	7×8	9×6	$\frac{1}{2}$ of 112	14×4	
7	10×5	$7^2 + 1^2$	25×3	$\frac{1}{5}$ of 250	
8	12×7	2×42	$100 - 26$	6×14	
9	12×8	$88 + 6$	$10^2 - 2^2$	6×16	
10	8×18	35×4	9×16	3×48	

TASK 10 Learner Worksheet Activity 1

INTEGERS

A. Inequalities

I. Compare +10 and +6:

10 is the greater of the two numbers and is further to the right on the number axis.

thus: 10 is greater than 6

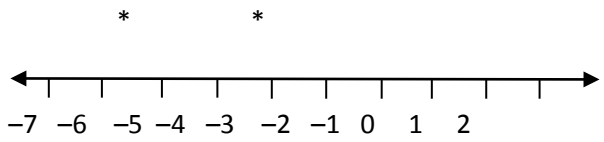
thus: 10 > 6

or 6 is smaller than 10

thus: 6 < 10

II. Compare –2 and –5:

If we compare –2 and –5, –2 lies to the right of –5 on the number axis:



thus: –2 is greater than –5 thus: –2 > –5

or –5 is smaller than –2 thus: –5 < –2

> Greater than

< Smaller than

III. Compare –4 and 2:

2 lies to the right of –4 on the number axis

thus: 2 is greater than –4 thus: 2 > –4

or –4 is smaller than 2 thus: –4 < 2

6.8

(a) Arrange from great to small:

(i) 2; –7; 0; –1

(ii) –3; –2; 2; 3

(iii) 2; –4; 1; 0; 9; 3

(iv) –30; –6; 4; 28; –10

(Individually)

(b) Arrange from small to great:

(i) 4; –5; 7; –12; –4

(ii) –4; –8; –6; –10; 14

(iii) 2; –18; 0; –13; 1; –20

(iv) 35; –112; –12; 21; –6

(Individually)

(c) Use the symbols <, > or = to make the following sentences true:

(i) 3 … –3

(ii) –5 … –2

(iii) 0 … –6

(iv) –100 … 9

(v) 3 … –5

(vi) 5 × 9 … 46

(vii) 1,45 + 1,45 … 2,80

(viii) 270 ÷ 3 … 90

(ix) 3 908 … 3 098

(x) $2^2 + 3^3 \ldots 5^2$

(Individually)

(d) Which one indicates a warmer temperature?

(i) 2 °C or –2 °C

(ii) –16 °C or 18 °C

(iii) +12 °C or –14 °C

(Individually)

(e) What is the temperature if it:

(i) rises with 1 °C from 3 °C ?

(ii) falls with 2 °C from 2 °C?

(iii) rises with 15 °C from –12 °C?

(iv) falls with 10 °C from 8 °C?

(v) rises with 12 °C from –16 °C?

6.9 Your teacher will hand out Worksheet 6.9. The following is an example of the worksheet:

(Work in pairs)

(a) Use a number axis to calculate:

(i) (+4) + (+1)

(ii) (–5) + (+2)

(iii) (–5) + (–3)

(iv) (–2) + (+8)

(Individually)

(b) Calculate the sum of the following without using a number axis:

(i) (+4) + (+8) =

(ii) (–4) + (–8) =

(iii) (–6) + (+2) =

(iv) (–3) + (+6)=

(v) (+8) + (+10) =

(vi) (+8) + (–10) =

(vii) (–6) + (–6) =

(viii) (–6) + (+6) =

(ix) (+6) + (–6) =

(x) (+2) + (–8) =

(Individually)

(c) Use the rearrangement concept to determine the following:

(i) (–4) + (+6) + (–2) + (+8)
(ii) (+6) + (–1) + (+5) + (+1)
(iii) (–16) + (+18) + (–2) + (+1)
(iv) (+20) + (–10) + (–15) + (+30)
(v) (–3) + (–12) + (+8) + (–5) + (–3)

(Individually)

(d) Calculate the sum of:

(i) +9 and –4

(ii) +3 and +9

(iii) –7 and –8

(iv) 27 and –20

(Individually)

(e) Calculate the number which has to be written inside the frame in order for the number sentences to be true:

(i) +2 + = +10

(ii) +2 + = 0

(iii) + (–7) = 5

(iv) (+8) + = –2

(v) (–4) + (–6) + = –15

(vi) (–12) + (–18) + = –22

(vii) + (28) + (–14) = –26

GAUTENG PROVINCE
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ACKNOWLEDGEMENTS:

TO THE GDE MATHEMATICS PROVINCIAL TEAM FOR THEIR INVALUABLE INPUTS SHARED THROUGHOUT THE DEVELOPMENT PROCESS OF THIS RESOURCE.

TEACHERS NEEDING FURTHER SUPPORT ARE ENCOURAGED TO COMMUNICATE WITH THEIR RESPECTIVE DISTRICT MATHEMATICS OFFICIAL.

District	Name	Phase	Tel Number
Head Office	Dumisani Maphanga	INTERSEN	011 355 0815
Ekurhuleni N	Prinivin Moodley	Senior	011 746 8090
Ekurhuleni N	Busi Sekobane	Intermediate	011 746 8674
Ekurhuleni S	Themba Tshabalala	Intermediate	011 389 6202
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Published in 2014

111 Commissioner Street
Johannesburg, 2001
Tel: 011 355 0000
www.education.gpg.gov.za