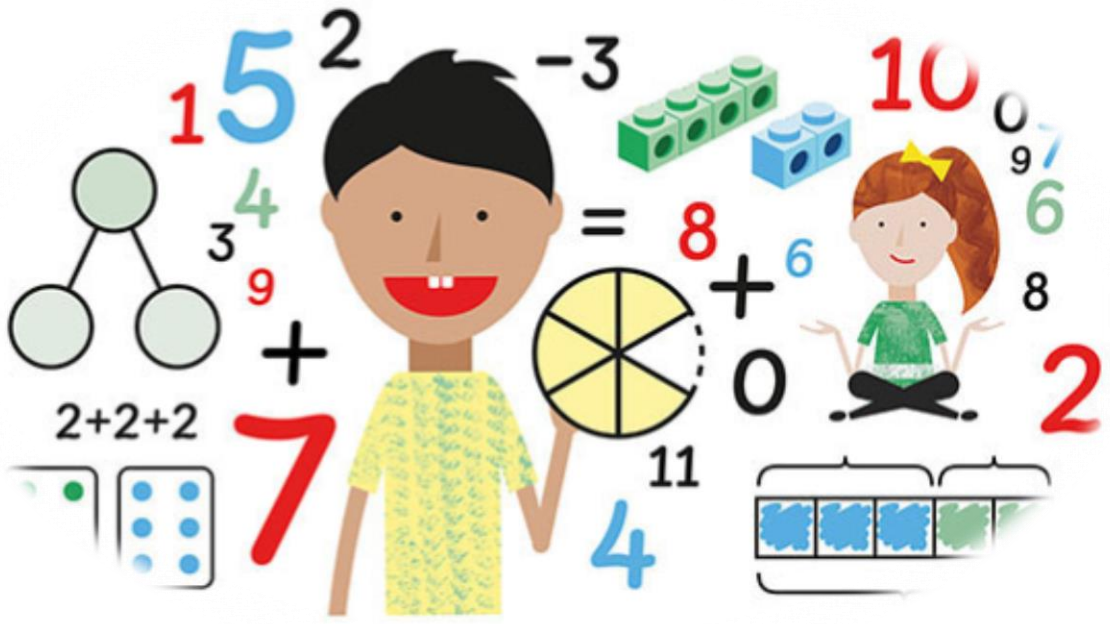
MY MATHEMATICS EXERCISE BOOK

GRADE 7



Practice and Learn Mathematics

Compiled by Marié Nell

◆ Work Sheet 1 Total = 75

Terminology

Question 1

What type of operation you will perform if the words below appear in a word sum?

a) Sum of: _____
b) Difference: _____
c) Product: _____
d) Quotient: _____
e) Factor: _____
f) divisor: _____
g) Square: _____ (7)

Question 2

Provide a definition for the following: Also show an example to show your definition. 1 mark for definition, 1 mark for example. (28)

a) prime number.
b) Prime factor:
c) multiple:
d) Factor:
e) coefficient:
f) Cubic number:
g) Square number:
h) Square root:
i) GCF
j) LCM
k) exponent
l) power
m) $\sqrt[3]{\ }$ (Cube Root)
’n) whole number

Question 3

Explain the following properties of equations **using variables and or numbers.**

a) Commutative property: 1

b) Distributive property: 1

c) Associative property: 1

Question 4

4.1 Complete:

a) 10^0 =_____

b) 7^1 = _____

c) 8x 0 = ____

d) 6÷ 0 = ____

e) 0 ÷ 9 =_____ (5)

4.2 Fill in the missing word.

a) By multiplying powers with the same base, the exponents are _____.

b) When powers with the same base are divided, the exponents are _____.

c) Name the order in which operations should be performed.

_____

d) The additive identity is _____.

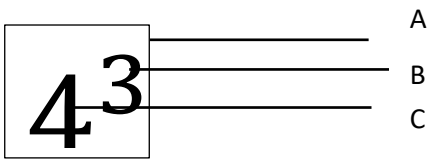
e) The multiplicative identity is _____. (5)

4.3 Label the following: (3)

a) _____

b) _____

c) _____



Question 5

Complete:

a. An_____ is an angle smaller than 90 °

b. An _____ is an angle greater than 90 ° but smaller than _____.

c. An _____ is 360°

d. A Straight Angle = _____°

e. A _____ is greater than 180 ° but smaller than 360 °

f. A triangle whose two legs are equal is called a _____triangle.

g. A triangle of which all sides are unequal is called a _____ triangle.

h. A triangle with all sides equal is called an_____ triangle.

i. A triangle that has a 90 ° angle is called a _____ triangle.

j. A triangle that has an angle of 100 ° is called an _____ triangle.

k. Explain the difference between a ray and line segment.

_____

_____

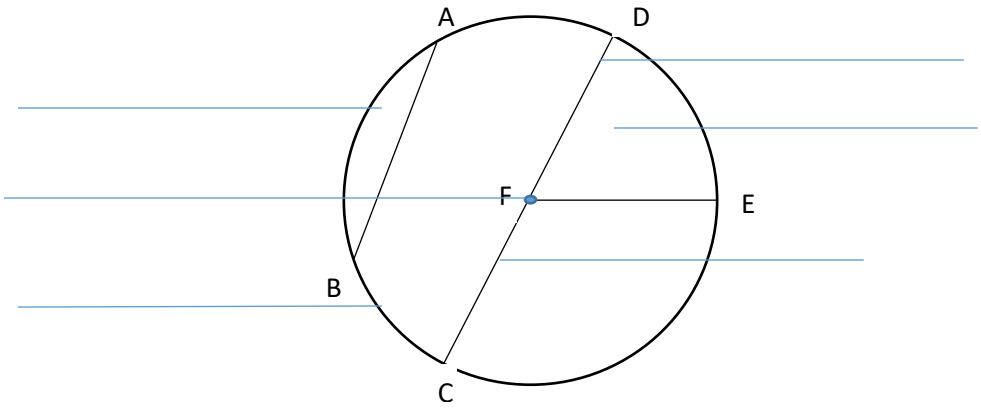
l. The sum of the three angles of a triangle = _____.

m. The sum of the 4 angles of a quadrilateral = _____.

n. A_____ is a quadrilateral with only 1 pair of opposite sides parallel. (14)

Question 6

Name the different parts of the circle: (6)



Question 7

a. Complete the Distance, Speed Time Triangle. (3)

b. Give the formula from the triangle to work out speed. _____ (1)

Total = 75

◆ Work Sheet 2 Total = 45

Factors, Prime Numbers, GCD and GCF

1. List the factors for the following numbers:

   a) 24_____

   b) 36_____

   c) 54_____

   d) 16 _____ (4)

2. a) Provide the first 10 prime numbers. _____

   b) Provide the prime numbers between 50 and 100._____

   _____

   c) Name the smallest positive prime number. _____ (5)

3. 1 Write the following numbers as the product of their prime factors:

   a) 42 _____ (3)

   b) 108 _____ (3)

3.2 Determine the GCD and LCM of the following numbers using their prime factors:

a) 72 en 108 _____ (5)

LCM = _____

GCM = _____

b) 132 en 180 _____ (5)

LCM = _____

GCM = _____

c) 36 en 42. _____ (5)

LCM = _____

GCM = _____

d) 160 en 192. _____ (5)

LCM = _____

GCM = _____

4. If two of the factors of a number are 12 and 5 and the product is 360 which is the third factor? _____ (2)

5. Write 2 + 2 + 2 + 2 + 3 + 3 + 3 + 3 + 3 + 3 in the simplest form without working out the sum. _____. (2)

6. Provide the multiples of the following numbers as requested.

a) First 4 multiples of 14: _____ (2)

b) Multiples of 7 between 40 and 80: _____ (2)

c) Multiples of 12 smaller than 50: _____ (2)

Total = 45

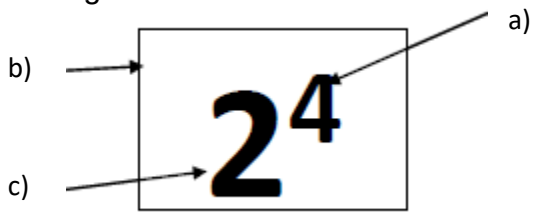
◆ Work Sheet 3 — Total = 55

Exponents, Powers, and Roots

1. a) Write 2x2x2x2x2x2x2x3x3x3x3x3 in exponential form. _____(1)

   b) Write $4^3 + 3^4$ in expanded form. _____ (1)

2. Label the following.



   a) _____

   b) _____

   c) _____ (3)

3. Explain what a square number is. _____

   _____ (2)

4. Calculate the following:

   a) $10^2 + 1^2 - 8^2 =$ _____ (2)

   b) $4^2 \div 2^2$ = _____ (2)

   c) $\sqrt{100} - \sqrt{36}$ = _____ (2)

   d) $\sqrt{100 - 64}$ = _____ (2)

e) $(\sqrt{25})^2$ = _____ (2)

f) $(\sqrt[3]{7})^3$ = _____ (2)

5 Explain the following exponent laws.

a. $2^3 \times 2^2 = 2^{3+2}$ (1)

_____

_____

b. $\frac{4^3}{4^2} = 4^{3-2}$ (1)

_____

_____

6. Determine the answer of the following numbers using their prime factors.

a) $\sqrt{1024}$ = _____ (2)

b) $\sqrt{1296} =$ _____ (2)

c) $\sqrt[3]{2744} =$ _____ (2)

d) $\sqrt[3]{5832} =$ _____ (2)

7. How many integers are there between $\sqrt{8}$ and $\sqrt{80}$? (2)

_____

8. Between which 2 integers will the following lie

a) $\sqrt{12}$ _____

b) $\sqrt{43}$ _____ (2)

9. Write the following answers in exponential form.

a) $4 \times 4^1 \times 4^3$ (1)

_____

b) $3^4 \times 3^4 \times 3^4$ (1)

_____

c) $6^3 \div 6^2$ (1)

_____

d) $10^2 \div 10$ (1)

_____

e) $2^5 \div 2^3$ (1)

_____

f) $9^4 \times 9^2 \times 9^1$ (1)

_____

g) 4×4 (1)

_____

h) $5^4 \times 5^2$ (1)

_____

i) $0 \times 0 \times 0 \times 0$ (1)

_____

j) $6^2 \div 6^2$ (1)

_____

k) 5^0 (1)

_____

l) $12^7 \div 12^5 \times 12^4$ (1)

_____

10. Calculate the following.

a) $\sqrt{90-9} \div 9$ (1)

_____

b) $\sqrt[3]{5^3} + \sqrt[3]{1^3}$ (1)

_____

c) $\sqrt[3]{64} \times \sqrt[3]{27}$ (1)

_____

d) $\sqrt[3]{250-34} - 214$ (1)

_____

e) $(\sqrt[3]{8})^2$+6 (1)

_____

f) $\sqrt[3]{1000000}$ (1)

_____

g) $\sqrt[3]{8} + \sqrt{16}$ (1)

_____

h) $\sqrt[3]{25+2}$ (1)

_____

i) $\sqrt[3]{a \times a \times a}$ (1)

_____

j) $\sqrt[3]{x^3 \times x^6}$ (1)

_____

Total = 55

◆ Work Sheet 4 Total = 30

Integers (Positive and Negative)

1. **In each case, provide the rule for the following operations with negative and positive integers**.

a) When 2 negative numbers are added together:

_____

b) When different signs (positive and negative) are added together.:

_____

c) Subtraction of different signs (negative minus positive):

_____

d) negative x / ÷ negative = _____

e) negative x / ÷ positive = _____ (5)

2. **Answered by applying order of operation**. (20)

a) 3 x (-5) + 2 x 7 = _____

b) 3 + 5 x (-2) + 7 = _____

c) 3 x (-5 + 2) – (-7) = _____

d) 3 x 3 – (-2) x (-2) x (-2) = _____

e) -7 + (-3) x (-2) = _____

f) 14 – (-12) = _____

g) 3 – 7 + 5 = _____

h) 3 – (-7) + (-5)= _____

i) 64 ÷ (-8) = _____

j) 10 + (-28) ÷ (-4) _____

k) -10 – 14 = _____

l) 16 + (-4) x 4 = _____

m) 12 x 0 + (-5) = _____

n) -5 + (-7) + 3 = _____

o) (4 + (-6)) x 3 = _____

p) -3 x (-3) x (-3) = _____

q) 3 x (-3) x (-3) = _____

r) 7 + 12 + 5 = _____

s) -5 + (-8) – (-3) = _____

t) 28 ÷ (-2) x (2) = _____

3. Calculate

a) $\sqrt[3]{-27}$ _____ (1)

b) $\sqrt[2]{16} + -2^3 =$ _____ (2)

c) $-5^2 \times -10^3 =$ _____ (2)

Total = 30

◆ Work Sheet 5 Total = 65

Fractions

1. *Match the correct answer from Column B with the word in Column A. Write only your choice from Column B with the question number of Column A.* (6)

Column A	Answer	Column B
1.1 Improper Fraction	1.1	A $4\frac{5}{6}$
1.2 Proper Fraction	1.2	B 7
1.3 Mixed Number	1.3	C $\frac{}{9}$
1.4 Denominator	1.4	D $\frac{7}{12}$
1.5 Numerator	1.5	E $\frac{18}{11}$
1.6 Whole Number	1.6	F $\frac{7}{}$

2. Simplify $\frac{18}{24}$. _____ (1)

3. Write $4\frac{5}{9}$ as an Improper Fraction. _____

(1)

4. $\frac{2}{3}$ of 33= _____ (1)

5. Calculate

1. $7\frac{13}{20} - 4\frac{2}{5} =$ (3)	6. $3\frac{3}{5} - 1\frac{2}{9} =$ (3)
2. $3\frac{3}{4} + 1\frac{2}{5} =$ (3)	7. $3\frac{2}{3} + 1\frac{3}{9} =$ (3)
3. $3\frac{3}{5} \times 4\frac{1}{6} =$ (3)	8. $\frac{12}{21} \times \frac{35}{48} =$ (3)
4. $\frac{3}{4} \div \frac{3}{12} =$ (3)	9. $1\frac{2}{16} \div 2\frac{3}{12} =$ (3)

5. $\left(\frac{1}{4}+\frac{2}{3}\right)\div\left(\frac{3}{4}-\frac{1}{2}\right)=$ (3)	10. $\left(\frac{2}{3}+\frac{3}{4}\right)\ van\ 1\frac{1}{17}=$ (3)
11. $\left(2\frac{3}{4}-2\frac{2}{3}\right)\times\left(1\frac{1}{4}+1\frac{1}{4}\right)=$ (6)	12 $\frac{3}{4}$ x $\frac{8}{9}=$ (2)

6.. Nicola spends $\frac{1}{2}$ hour on her English homework, $\frac{2}{3}$ hours on Math homework and 1 $\frac{1}{6}$ hours on an Afrikaans essay.

a) How many minutes does she spend on Mathematics? _____ (2)

b) How long does it take her to write her essay? _____ (1)

c) How long does she do homework altogether? _____
(3)

7. How much is $3\frac{4}{5}$ greater than the product of $\frac{3}{5}\times 1\frac{3}{4}$. Show ALL your operations
(5)

_____

8. Henry goes to town and spends $\frac{5}{8}$ of his money on a new pair of 20% off sneakers. The original price of the sneakers was R675.

a) Calculate the sale price. _____ (3)

b) How much money did Henry have before he bought the sneakers? (3)

c) How much money does he have left?
(1)

◆ Work Sheet 6 Total = 65

Decimals and Percentages

1 Write the numbers in extended notation.

a $56{,}49\mathbf{3} =$ _____ (1)

b $\mathbf{7}{,}124 =$ _____ (1)

c $0{,}\mathbf{6}84 =$ _____ (1)

d $\mathbf{2}4{,}83 =$ _____ (1)

e $9{,}\mathbf{1}6 =$ _____ (1)

2. Study the following numbers and then answer the questions.

0; 0,75; 3; $\frac{1}{3}$; 37%; 0,173; $\frac{4}{5}$; 20%; 5

2.1.1 Arrange the numbers above in ascending order.
(each wrong Answer will be marked negative ½) (2)

_____

2.1.2 Write down all the integers. _____ (1)

2.1.3 Convert $\frac{1}{3}$ to a decimal. _____ (2)

_____

2.1.4 Write 20% as a Proper Fraction. Simplify your answer. (1)

_____

2.1.5 Write 0.75 as a Proper Fraction. (Simplify your Answer). (2)

_____

2.2 Calculate and Simplify the following. Show how you go about it.

2.2.1 a) $18 - 3 \times 5 \div 5 =$ _____ (2)

_____

_____

b) $35 \div 5 + (18 - 6) =$ _____ (2)

_____

_____

_____

2.2.2 a) $\frac{3}{5} + 30\% - 0{,}16 =$ _____ (2)

_____

b) Write your Answer in 2.2.2a as a percentage. _____ (1)

c) Write your Answer in 2.2.2a as a Proper Fraction. _____ (1)

2.3 Write only the answer in decimal form.

a) $23{,}45 \div 100 =$ _____

b) $3{,}507 \times 1000 =$ _____

c) $\frac{1}{3} \times \frac{1}{3} =$ _____

d) $\frac{1}{3} + \frac{1}{3} =$ _____

e) $\frac{3}{10} + 0{,}5 =$ _____ (5)

2.4 Round the following numbers according to the table. (6)

Number	To the closest whole number	To the closest tenth	To the closest hundredth
1,475			
19, 642			

3. Calculate. Provide your answer in decimal form.

a. 0,375 + $\frac{5}{5}$ + 1,5 = _____ (2)

b. $\frac{4}{5}$ + 0,16 + 0,75 = _____ (2)

c. 0,125 + $\frac{1}{8}$ + $\frac{4}{5}$ = _____ (2)

4. Do the following calculations. Show all your work and simplify your Answer whenever possible. All answers must be in decimal form.

4.1 $345{,}05 \div 0{,}05 = x$ (2)

4.2 $0{,}25 \times 1\frac{3}{5} = x$ (3)

4.3 $1{,}543 + \frac{2}{3} = b$ (2)

4.4 $2\frac{1}{4} \times \frac{4}{8} = a$ (3)

4.5 $2,4 \times 0,12 = a$

4.6 $5,472 \div 0,8 = a$

(3)	(3)

5. Determine the percentage increase or decrease in the following cases.

a) 80 to 108 = _____ b) 250 to 100 = _____ (4)

6. The sunglasses store has a 25% sale on sunglasses. Calculate the following.

a) If sunglasses cost R200, what is the new selling price? (3)

_____

_____

b) How much Rand discount was given?

(2)

_____

_____

7. A 17m garden hose must be cut into 4 equal parts. Calculate the length of each piece. (2)

_____

_____

_____

◆ Work Sheet 7 Total = 50

Ratio and Rate

1 **Write the ratios of red to blue beads as fractions**:

a) $2:5$ (2)

Red: _____

Blue: _____

b) $3:4$ (2)

Red: _____

Blue: _____

c) $3:8$ (2)

Red: _____

Blue: _____

d) $5:7$ (2)

Red: _____

Blue: _____

2 **Calculate the % Boys and % Girls in each of the following ratios**.

a) $2:4$ (2)

Boys: _____

Girls: _____

b) $3:7$ (2)

Boys: _____

Girls: _____

c) $4:5$ (2)

Boys: _____

Girls: _____

d) $1:3$ (2)

Boys: _____

Girls: _____

3. Rewrite the relationships in the simplest form:

a) $14l:42l$ (1)

_____

b) $15ml:25ml$ (1)

_____

c) $150\ cm:3m$ (1)

_____

d) $\frac{2}{5}:4$ (2)

_____

4. Mrs. Barnard gathered the following information about the learners in her class:

	Right-Handed	Left-Handed
Girls	12	3
Boys	16	4

a) Write down the ratio of right-handed Boys to right-handed girls. (1)

_____

b) Write down the ratio of left-handed Boys to left-handed girls. (1)

_____

c) Write down the ratio of right-handed Boys to left-handed Boys. (1)

_____

d) Write down the ratio of right-handed girls to left-handed girls. (1)

_____

e) Write down the ratio of left-handed learners to right-handed learners. (1)

_____

5. a) Increase R330 by the ratio 2:3 _____ (2)

b) Decrease R90 by the ratio 3:2 _____ (2)

6. Calculate:

a) Cost of 1 kg of apples if 5 kg costs R52. (2)

_____

b) 260km / 2½ hour = _____km / hour (2)

c) My heart beats 56 beats per minute = _____ beats / hour
(2)

7. Last year a pancake was sold at the cake sale at R3 for a pancake. Increase the price for this year in the 6: 7 ratios. (3)

_____

8. Divide R 112 in the ratio 5: 9. (2)

_____

9. A concrete mix is loaded at a building site. The specifications for the foundations are 1-part cement, 2½ parts river sand and 4 parts stone. If 6m^3 of the dry mixture is discharged, what are the volumes of the cement, sand and stone in the mixture respectively? _____ (3)

10. Calculate the rate in m^3 / sec, if the pipe that fills a pool delivers 12m^3 of water in 10min. (3)

_____

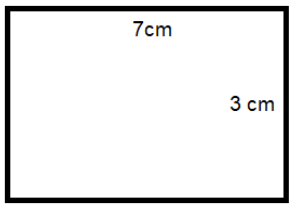
11. Calculate the distance traveled if a car was traveling at an average speed of 120km / hour after 7 hours 15 min. _____ (3)

◆ Work Sheet 8 Total = 30

Functions and relationships

1. Use the given formulas and then calculate the perimeter and or area of the different shapes.

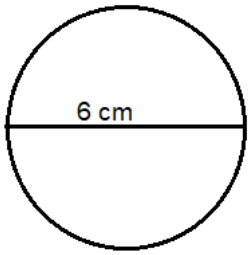
Shape	Perimeter	Surface Area
Square	4*S	**$S^2 = a^2$**
Rectangle	**2l + 2b**	**l x b = a^2**
Triangle	**Sum of 3 sides**	**½ b x h⊨ a^2**
Circle	$2\pi r$ π= 3,14	πr^2= **a^2** π= 3,14

a) 

(2)

Perimeter: _____ (2)

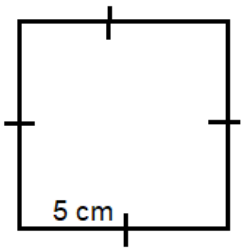
Surface Area: _____

b) 

(2)

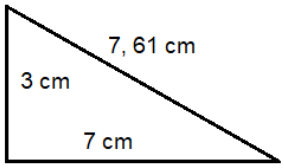
Perimeter: _____ (2)

Surface Area: _____

c) 

Perimeter: _____ (2)

Surface Area: _____ (2)

d) 

Perimeter: _____ (2)

Surface Area: _____

(2)

2 The linear equation is given as $y = 5x + 40$.

a) $Calculate\ y\ if\ x = 6.$ (1)

_____

_____

b) $Calculate\ x\ if\ y = 105.$ (2)

_____

_____

c) $Calculate\ x\ if\ y = 85.$ (2)

_____

_____

3. The following values are given:

$a = 5; \quad b = -3\ and \quad c = 9.$

Calculate the values of the expressions:

a) $a + \frac{1}{2}(c) - b$ (3) b $4c(a - b)$ (3)

_____ _____

c) $\frac{-4ac}{2b}$ (3)

_____

◆ Work Sheet 9 Total = 45

Patterns

1. Explain:

   a) What is meant when it is said that a pattern has a constant difference?

   _____ (2)

   b) What is meant when a pattern is said to have a constant ratio?

   _____ (2)

2. Calculate the following two terms in each number pattern.

   a) 6; 14; 22; 30; ……..;……..

   b) 1; 2; 4; 8; 16; ……..;……..

   c) 1; 2; 4; 8; ……..;……..

   d) 1; 3; 9; 27; ……..;…….. (8 x ½)

3. Use the rule to find the first four terms in each number pattern.

   a) Start at 3 and add 2 each time. (2)

   _____; _____; _____; _____

   b) Start at 1 and double every time.

   _____; _____; _____; _____ (2)

   b) Start at 1000 and multiply by 1/2 each time.

   _____; _____; _____; _____ (2)

4. Study the following sequences. describe the rule of each in your own words and then use the rule to determine the 10th term of that row

   a) 4; 8; 12; 16; ...

   Rule_____

   10th term_____ (3)

b) 1; 4; 9; 16; ...

Rule_____

10th term_____ (3)

c) 5; 8; 11; 14

Rule_____

10th term_____ (3)

5. a) Use the rule **m = 2n + 3** to complete the following table. (4)

n	5	6	a)	b)
m	c)	d)	27	39

b) Calculate the value of m if n = 201 _____ (1)

6. Study the following pattern and then answer the questions.

Input (a)	1	2	3	4	**12**	**20**	***z***
output (b)	5	9	13	17	x	***y***	**121**

b.1) Describe the pattern in words. (1)

_____

b.2) Write the rule of the pattern as an expression. (1)

_____

b.3) Find the values of:

i. x = _____ (1)

ii. y = _____ (1)

iii. z = _____ (1)

7. Study this dots design

a) Draw the fourth design. (2)

b) Write down the rule you used to expand the patterns.

1) Black dots _____ (2)

_____

2) Light/Red Dots: _____ (2)

_____

c) Complete the given table to compare the number of dark spots with the light spots. (12 x½)

Pattern	1	2	3	4	5	10
Light/ Red Dots						
Black dots						

◆ Work Sheet 10 Total = 50

Algebraic Expressions and Equations

1. Study the expression and answer the questions. (3)

2a + 7

a) _____ is the variable.

b) _____ is the coefficient.

c) _____ is the constant.

2. Write the following expressions in **words.**

a) 2(a + b) (1)

_____

_____

b) 6y – 1 (1)

_____

_____

c) 10 - (y + 3) (1)

_____

_____

3. Resolve the unknown if $a = 3, b = 5 \; and \; c = -4$:

a) $a + b \times c$ (2) b) $a - 3b$ (2)

_____ _____

_____ _____

c) $c^2 - ac + 12$ (2)

d) $3a + 3b - 2c$ (2)

4. Solve for x:

a) $x + 9 = 14$ (2)

b) $48 = 39 - x$ (2)

c) $135 = 5x + 10$ (2)

d) $\frac{4x}{9} = 8$ (2)

e) $\frac{y}{4} + 12 = 17$ (3)

f) $x^2 - 23 = -7$ (2)

5. Resolve the unknown if $c = 4; d = -5$ and $e = 2$:

a) $-d + (e^2 \times d)$ (2)

b) $c - 5c + e \times d$ (3)

c) $4e^2 \times e + cd - e$ (3)

_____

_____

_____

d) $2d + \frac{c}{e}$ (2)

_____

_____

_____

6. Write the following as expressions. (5)

a) A number is reduced by 4 to power 2. _____

b) 12 is divided by an unknown number and added to 14. _____

c) Twelve less than a Number. _____

d) 9 is added to the Square of a variable. _____

e) 7 less than the sum of 2 unknown numbers. _____

7. Determine the value of the following expressions:

a) $4mno - 2mn + o, as\ m = 5, n = 8\ en\ o = 2.$

_____

_____

_____ (4)

b) $3(a - c) - 4(2a + b - 4c), as\ a = 2, b = 7\ en\ c = 3.$

_____

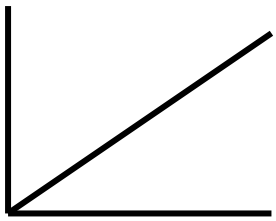
_____

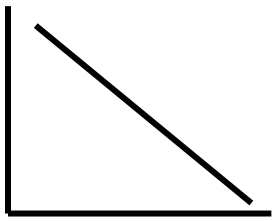
_____ (4)

◆ Work Sheet 11 Total = 35

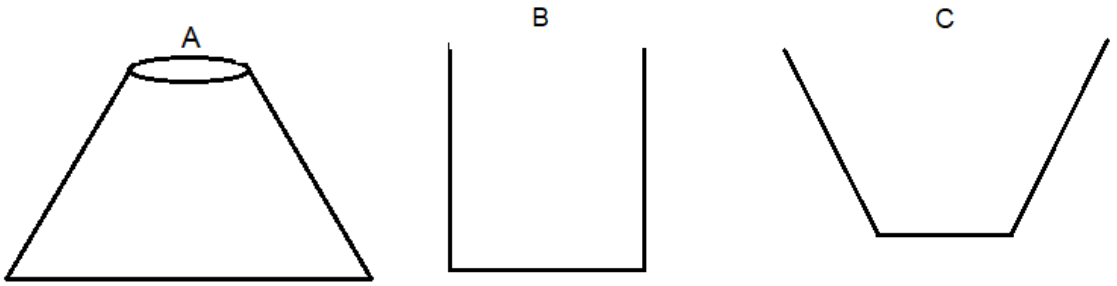
Graphs

Line graphs consist of an X and Y axis

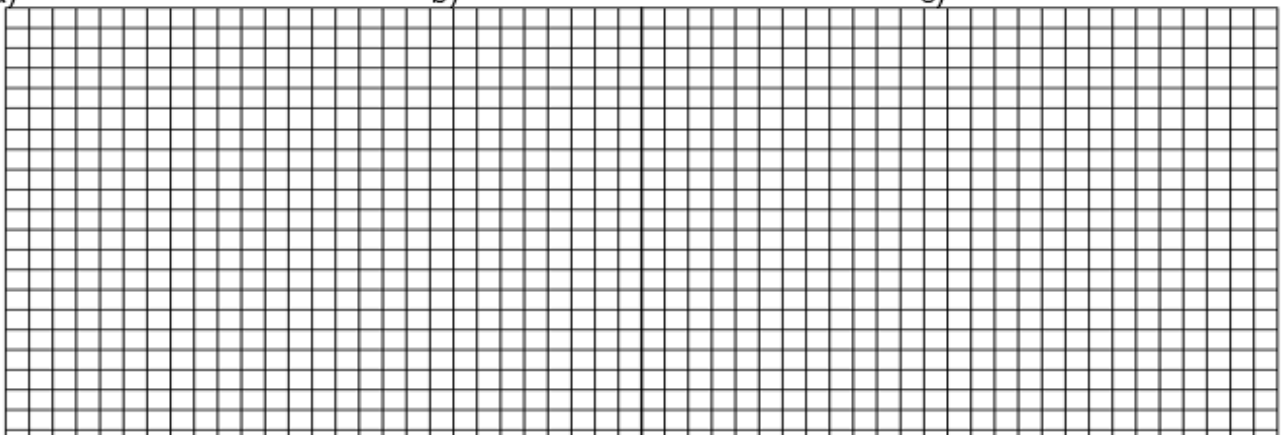
1. The y-axis is the _____line. (1)
2. The x-axis is the _____line. (1)
3. The variable shown on the y-axis is known as the _____ variable. (1)
4. The variable shown on the x-axis is known as the _____ variable. (1)
5. Linear graphs are a) _____ graphs where the relationship between the dependent and independent variable is a b) **constant / different** increase or decrease. (2) (2)
6. 
Linear Graph that a) _____ in value


Linear Graph that b) _____ in value (2)
7. A constant value graph is indicated by an a) _____ running b) _____ to the x-axis. (2)

8. Water drips into three containers, A, B and C, at a constant rate. The containers are shown below. Draw a graph to show how the water level in the containers will differ over time.
(6)



a) b) c)

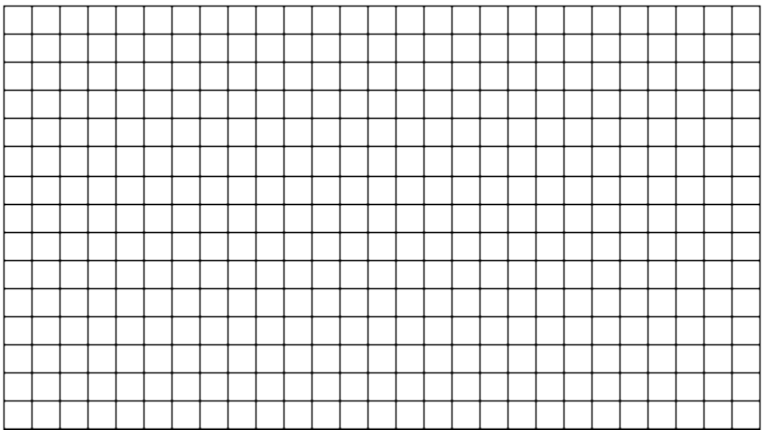


9. The distance (km) traveled by a car is calculated by the following formula:

Distance (D) = Speed (S) × Time (T)
Time is measured in hours.

Speed (S):	60	60
Time (T):	2	3
Distance (D):	120	180

(a) Present the information on a graph. (3)



(b) Is the car's speed constant? Motivate your answer. (2)

_____

_____

(c) In which unit is the speed measured? _____ (1)

(d) Use your graph and answer the following questions.

Indicate on the graph where you made the readings.

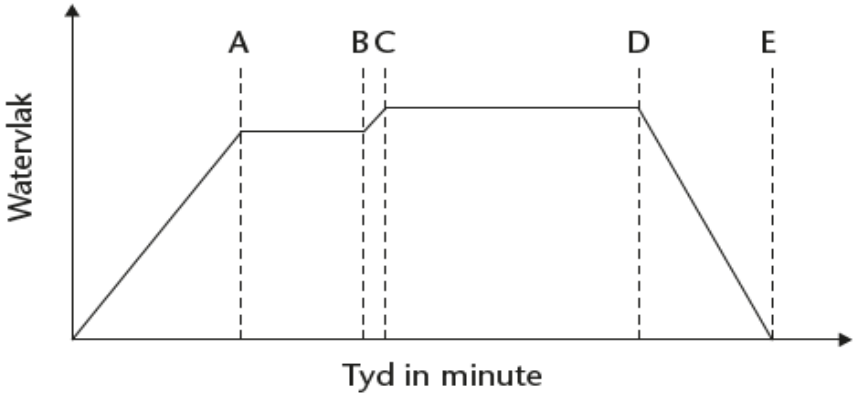
(i) What distance will be covered after 6 hours? _____ (1)

(ii) How long will it take the car to cover 330 km? _____ (1)

10. After a difficult training session, Petru ran herself a nice full bath. While the water was running in, she brushed her teeth so she could get in bed straight after.

This graph shows how the level of water in the bath changes.

Take a close look at the graph and describe what you think happened using the different Alphabet letters. (5)



Begin tot A _____

A-B _____

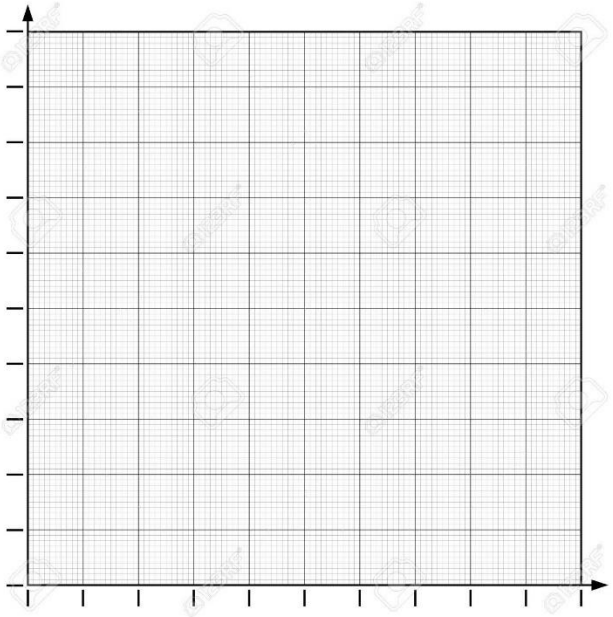
B-C _____

C-D _____

D-E _____

11. a) Draw a graph to illustrate the following events:

During a rainstorm, Riëtte put a measuring cup outside to measure how much it was raining. After 10 minutes of heavy rain, there was 200 mℓ in the cup. It started to rain softer, and after another 20 minutes there was 250 mℓ in the cup. When Riëtte went to look 20 minutes later there was 280ml in the measuring cup. 30 minutes later she went to look again, but there was no change. (5)



b) Is it a linear or a non-linear graph? _____ (1)

◆ Work Sheet 12 Total = 60

Geometry

1. Complete the following by writing down the missing words:

a) An angle of 215 ° is called a _____ angle.

b) The sum of the interior angles of a Triangle is equal to ____.

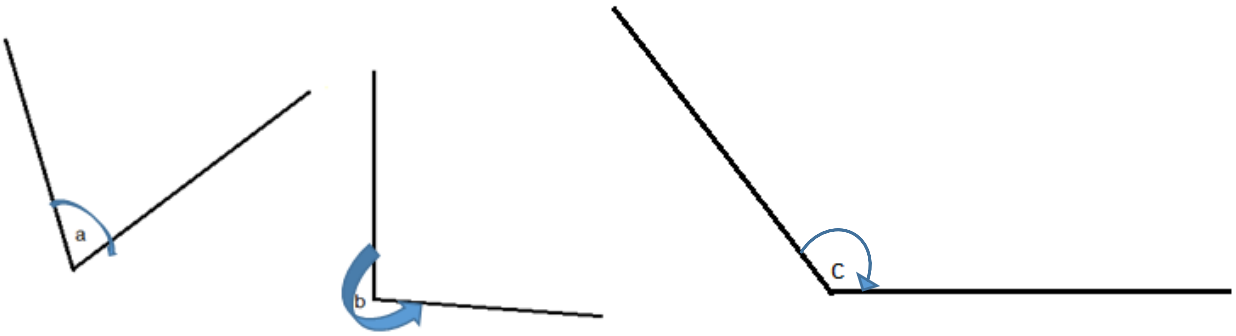
c) A triangle whose one angle is 90 ° is called a _____.

d) A triangle whose two sides are the same length is called an _____ triangle.

e) A quadrilateral of which all sides are equal, but the angles are not equal is called a _____. (5)

2. Measure and label the following angles:

a) _____ b) _____ c) _____ (3)



3. Draw:

a) Draw line segment AB 30 mm long. (1)

b) Draw KL || OP. (1)

c) Use your compass and ruler and construct PQ ⊥ AB (2)

4. Give the name of each angle as well as a description in degrees.

Angle	Name of Angle	Degrees
	a).....	b).....
	c).....	d) .....
	e).....	f).....
	g).....	g).....
	i).....	h).....

(10)

5. Use your compass and ruler to draw an equilateral triangle with lengths of 7cm. (2)

6. What shape properties are described here?

(Square, Rectangle, Parallelogram or Kite)

a) Four angles of 90 ° each.

Two pairs of opposite sides are equally long and parallel. (1)

_____

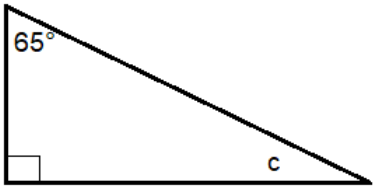
b) Two pairs of opposite angles are equal. The angles are not 90 °. (1)

Two pairs of opposite sides are equally long and parallel.

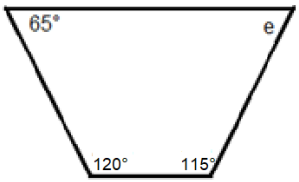
_____

7. The Triangle below is not drawn to scale. Calculate the size of angle c.

_____ (1)

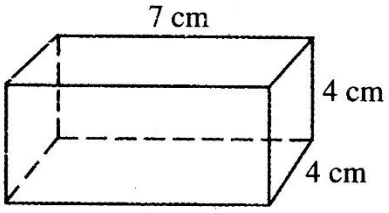


8. The quadrilateral below is not drawn to scale. Calculate the magnitude of angle e.



_____ (1)

9. a) Name the 3-D Shape.



_____ (1)

b) Calculate the volume of the Shape. (2)

_____

_____

c) Determine the outer surface area of the Shape. (4)

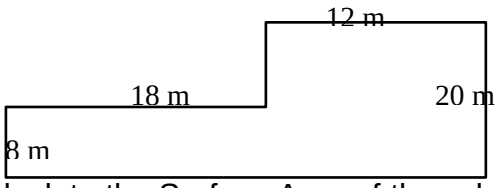
_____

_____

_____

_____

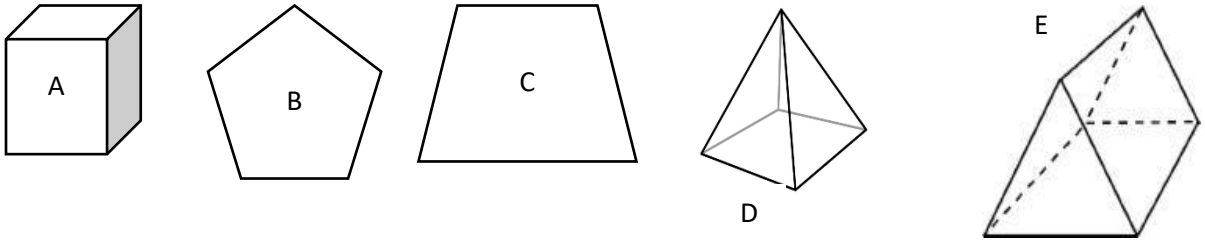
10. Study the following figure of the school yard and then answer the questions that follow.



a) Calculate the Surface Area of the school grounds. _____
(3)

b) Calculate the Perimeter of the school grounds. _____
(2)

11. Name the following figures: (5)



A:_____

B:_____

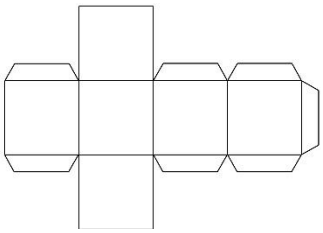
C:_____

D:_____

E:_____

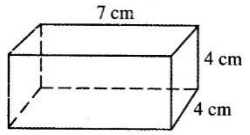
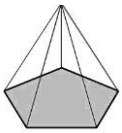
12. Which 3D shapes can be folded from the following template?

(2)

a)  _____

b)  _____

13. Complete the table on the given shapes (8)

13.1.	Name	Total Faces	Total Corners	Total Edges
	a.	b.	c.	d.
13.2 	a.	b.	c.	d.

14. Draw a Circle with a diameter of 5cm and indicate the following.. (6)

a) Diameter

b) radius

c) Cord

d) Circumference

15. Calculate the Perimeter of the Circle in Question 14 _____

(2)

16. Calculate the area of the Circle in Question 14. _____ (3)

◆ Work Sheet 13 Total = 60

Data Handling

1. The following is a presentation of Pieter's Mathematics results (%) for the year.

67; 45; 65; 69; 56; 65; 76; 65; 70; 54; 65; 67; 70; 72; 75;

a) Organize the data using a stem and leaf graph. (4)

b) What is the highest% he has achieved? _____ (1)

c) What is the lowest% he has achieved? _____ (1)

d) Name and explain the median of the data? _____

_____ (2)

e) Name and explain the mode of the data? _____

_____ (2)

f) What is the average of the data? (You may use your calculator) (2)

_____

_____

g) Calculate and explain the scope / distribution of the data? _____

_____ (2)

2. Jasper made the following survey about the color of the children in his grade's eyes.

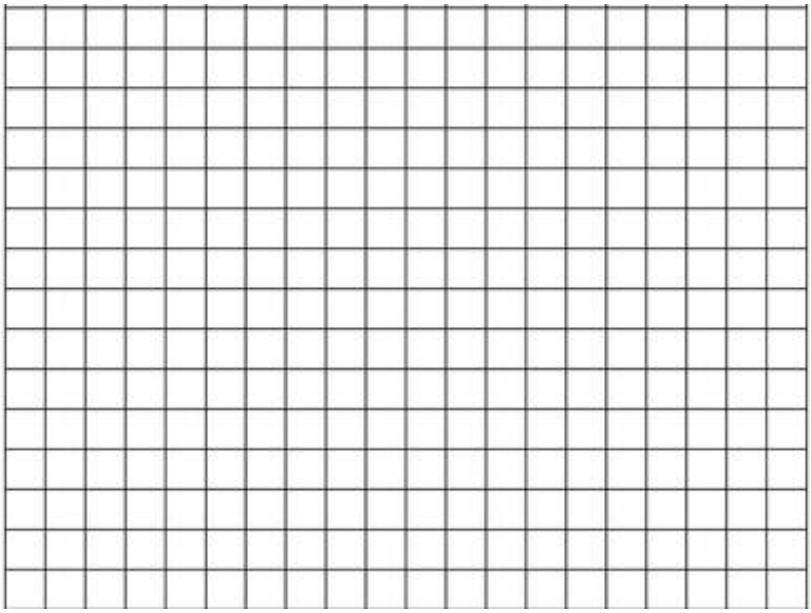
a) Complete the table. (5)

Eye Color	Frequency	Total
BLUE	𝍸 𝍸 𝍸 |	
GREEN	𝍸 𝍸 𝍸 𝍸 ||	
BROWN	𝍸 𝍸 𝍸 𝍸 𝍸 ||	
GREY	𝍸 𝍸 𝍸 𝍸 |	
	Total	

b) What fraction of the class has brown eyes? (Simplify)

_____ (2)

c) Represent the information on a bar graph,



3. Aneske and Heleen had to do research to find out which fast food restaurants in town are most popular with the learners.

Voltooi die tabel hieronder (24)

Favorite restaurant with learners from Vorentoe Primary School						
Restaurant	Boys			Girls		
		Fraction of Total	° sector on pie chart		Fraction of Total	° sector on pie chart
Steers	18			27		
McDonalds	42			18		
Kentucky	30			18		
Wimpy	24			18		
Spur	6			9		
Total			360°			360°

b. Use a compass and protractor to draw a pie chart for the Boys (7)

◆ MEMORANDUM 1 Total = 75

Terminology

Question 1

What type of operation would you perform if the words below appear in a word sum?

a) Sum of: ADD_____
b) Difference: SUBTRACT_____
c) Product: MULTIPLY_____
d) Quotient: DIVIDE_____
e) Factor: MULTIPLY OR DIVIDE (DEPENDS ON THE INFORMATION)_____
f) divisor: DIVISIOR_____
g) Square: MULTIPLY_ (7)

Question 2

Provide a definition for the following: Also show an example to show your definition. 1 mark for definition, 1 mark for example. (28)

a)	prime number	A number that has only 2 factors. 1 and himself e.g. 3
b)	Prime factor:	A number that has only 2 factors and the factor of a compound number (2 and 3 are prime factors of 6)
c)	multiple:	Numbers are divisible into their multiples 12 is a multiple of 3 because 12 can be divided by 3 V3 = {3; 6; 9; 12; 15; 18; ...}
d)	Factor:	A number is a factor of another number if it is divisible into it: 3 is a factor of 12 because I can make a multiplication of 3 to get to 12.
e)	Coefficient:	The number in front of a variable. E.g. 2a 2 is the coefficient
f)	Cubic number:	When a number is multiplied by itself 3 times, the answer is a power of 3 E.g. 3x3x3= 27 27 = power of 3
g)	Square number:	When a number is multiplied by itself, the answer is a square number 4 x 4 = 16 16 is a square number
h)	Square root:	The number that must be multiplied by itself to produce a square number E.g. 4 is the square root of 16 because 4 x 4 = 16

i)	GCF	When looking at 2 or more numbers, the GCF is the largest divider that can be divided into both without a remainder. GCF of 24 and 36 is 12
j)	LCM	When looking at 2 or more numbers, the LCM is the smallest number in which both are divisible LCM of 4 and 6 is 12
k)	exponent	The number indicating how many times a base has to be multiplied by itself E.g. 5^2 2 is the exponent
l)	power	A base and its exponent e.g. 4^3
m)	$\sqrt[3]{\ }$ (Cube Root)	Opposite of Cubic number. The number that must be multiplied three times by itself to get to the answer under the root sign. 3x3x3 = 27 so $\sqrt[3]{27} = 3$
n)	whole number	All positive numbers from 0 to 0; 1; 2; 3; 4; 5; 6; 7; .....

Question 3

Explain the following properties of equations **using variables and or numbers.**

a)	Commutative property:	3 x 5 = 5 x 3 of 2 + 5 = 5 + 2	1
b)	Distributive property:	2(3 +4) = 2 x 3 + 2 x 4	1
c)	Associative property:	(2 + 8) + 7 = 2 + (8 + 7)	1

Question 4

4.1 Complete:

a) 10^0 =___1___

b) 7^1 = ____7__

c) 8x 0 = __0__

d) 6÷ 0 = __E__

e) 0 ÷ 9 =___0__ (5)

4.2 Fill in the missing word.

a) By multiplying powers with the same base, the exponents are added.

b) When powers with the same base are divided, the exponents are subtracted.

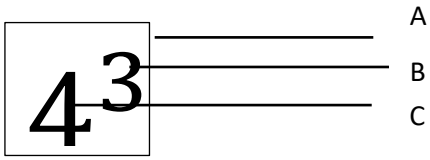
c) Name the order in which operations should be performed.

Bracket, Of, Division, Multiplication, Addition and Subtraction

d) The additive identity is ____0_____.

e) The multiplicative identity is _____1_____. (5)

4.3 Label the following:



(3)

a) Power_____

b) Exponent_____

c) Base_____

Question 5

Complete:

a. An Acute Angle is an angle smaller than 90 °

b. An Obtuse Angle is an angle greater than 90 ° but smaller than 180°.

c. A Revolution is 360°

d. A Straight Angle = 180°

e. A Reflex is greater than 180 ° but smaller than 360 °

f. A triangle whose two legs are equal is called an isosceles triangle.

g. A triangle of which all sides are unequal is called a scalene triangle.

h. A triangle with all sides equal is called an equilateral triangle.

i. A triangle that has a 90 ° angle is called a right-angled triangle.

j. A triangle that has an angle of 100 ° is called an obtuse triangle.

k. Explain the difference between a ray and line segment. Line segment has a definite beginning and end point. Ray has a definite starting point, but not an end point

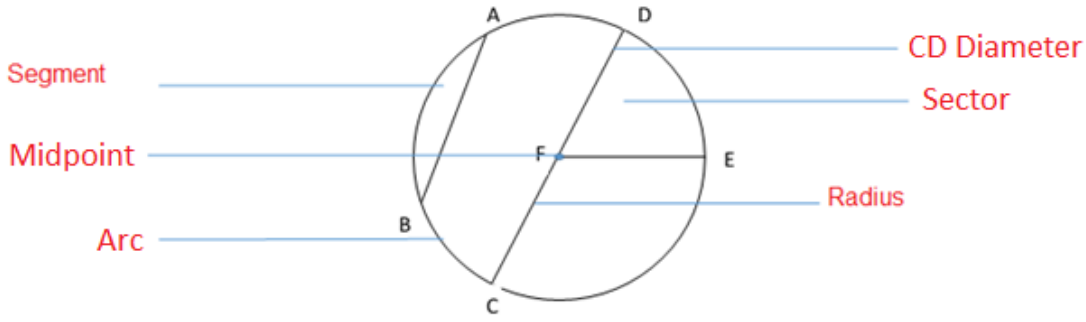
l. The sum of the three angles of a triangle = 180°

m. The sum of the 4 angles of a quadrilateral = 360°.

n. ‘n Trapezium is a quadrilateral with only 1 pair of opposite sides parallel. (14)

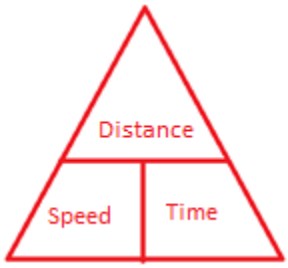
Question 6

Name the different parts of the circle: (6)



Question 7

a. Complete the Distance, Speed Time Triangle. (3)



b. Give the formula from the triangle to work out speed. $S = \frac{D}{T}$ (1)

Total = 75

◆ MEMORANDUM 2 Total = 45

Factors, Prime Numbers, GCD and GCF

1. List the factors for the following numbers:

   a) F_{24} = { 1; 2; 3; 4; 6; 8; 12; 24}

   b) F_{36} = { 1; 2; 3; 4; 6; 9; 12; 18; 36}

   c) F_{54} = { 1; 2; 3; 6; 9; 18; 27; 54}

   d) F_{16} = { 1; 2; 4; 8; 16} (4)

2. a) Provide the first 10 prime numbers. 2; 3; 5; 7; 11; 13; 17; 19; 23; 29

   b) Provide the prime numbers between 50 and 100. 53; 59; 61; 67; 71; 73; 79; 83; 89; 97

   c) Name the smallest positive prime number. 2 (5)

3. 1 Write the following numbers as the product of their prime factors:

   a) (3)

2	42
3	21
7	7
	1

2 x 3 x 7 = 42

   b) 108 __ 2x2x3x3x3= 108 (3)

2	108
2	54
3	27
3	9
3	3
	1

3.2 Determine the GCD and LCM of the following numbers using their prime factors:

a) 72 and 108 _____
(5)

2	72		2	108
2	36		2	54
2	18		3	27
3	9		3	9
3	3		3	3
	1			1

LCM = 2 X 2 X 2 X 3 X 3 X 3 = 216

GCD = 2 X 2 X 3 X 3 = 36

b) 132 and 180 _____ (5)

2	132		2	180
2	66		2	90
3	33		3	45
11	11		3	15
	1		5	5
				1

LCM = 2X2X3X3X5X11 = 1980

GCM = 2X2X3 = 12

c) 36 and 42. _____ (5)

2	36		2	42
2	18		3	21
3	9		7	7
3	3			1
	1			

LCM = 2X2X3X3X7 = 252

GCM = 2X3 =6

d) 160 and 192. _____ (5)

2	160		2	192
2	80		2	96
2	40		2	48
2	20		2	24
2	10		2	12
5	5		2	6
	1		3	3
				1

LCM = 2X2X2X2X2X3X5=960

GCM = 2X2X2X2X2 = 32

4. If two of the factors of a number are 12 and 5 and the product is 360 which is the third factor? _____ (2)

360 ÷ (12 X 5) = 360 ÷ 60 = 6 The other factor is 6

5. Write 2 + 2 + 2 + 2 + 3 + 3 + 3 + 3 + 3 + 3 in the simplest form without working out the sum. 2x4 + 3 x 6 (2)

6. Provide the multiples of the following numbers as requested.

a) First 4 multiples of 14: _ M_{14} = {14; 28; 42; 56; ...} (2)

b) Multiples of 7 between 40 and 80: M_7 = {...; 42; 49; 56; 63; 70; 77...} (2)

c) Multiples of 12 smaller than 50: M_{12} = {12; 24; 36; 48} (2)

Total = 45

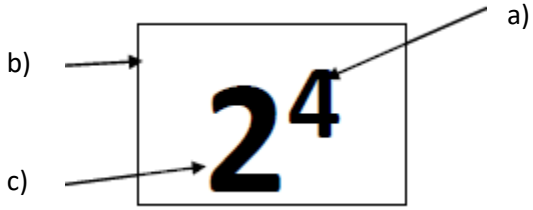
◆ MEMORANDUM 3 Total = 55

Exponents, Powers, and Roots

1. a) Write 2x2x2x2x2x2x2x3x3x3x3x3 in exponential form. 2^7 X 3^5 (1)

   b) Write $4^3 + 3^4$ in expanded form. 4X4X4X3X3X3X3 (1)

2. Label the following.



   a) Exponent

   b) Power

   c) Base (3)

3. Explain what a square number is. When a number is multiplied by itself, the answer is a square number. (2)

4. Calculate the following:

   a) $10^2 + 1^2 - 8^2 =$ 100 + 1 – 64 = 101 – 64 = 37 (2)

   b) $4^2 \div 2^2 = \div$ 16 ÷ 4 = 4 (2)

   c) $\sqrt{100} - \sqrt{36} =$ 10 – 6 = 4 (2)

   d) $\sqrt{100 - 64} =$ $\sqrt{36} = 6$ (2)

   e) $(\sqrt{25})^2 =$ 25 (2)

   f) $(\sqrt[3]{7})3 =$ 7 (2)

5 Explain the following exponent laws.

a. $2^3 \times 2^2 = 2^{3+2}$ (1)

When powers with the same base are multiplied, the exponents are only added together

b. $\frac{4^3}{4^2} = 4^{3-2}$ (1)

When powers with the same base are divided, the exponents are subtracted.

6. Determine the answer of the following numbers using their prime factors.

a) $\sqrt{1024}$ = _____ (2)

2	1024
2	512
2	256
2	128
2	64
2	32
2	16
2	8
2	4
2	2
	1

$$\sqrt{1024} = \sqrt{2^{10}} = \sqrt{2^5 \times 2^5} = 2^5 = 32$$

b) $\sqrt{1296} =$ _____ (2)

2	1296
2	648
2	324
2	162
3	81
3	27
3	9
3	3
	1

$$\sqrt{1296} =$$

$$\sqrt{2^4 \times 3^4} = \sqrt{2^2 \times 2^2 \times 3^2 \times 3^2} = 2^2 \times 3^2 = 36$$

c) $\sqrt[3]{2744} =$ _____ (2)

2	2744
2	1372
2	686

7	343
7	49
7	7
	1

$\sqrt[3]{2^3 \times 7^3} = \sqrt[3]{2 \times 2 \times 2 \times 7 \times 7 \times 7} = 2 \times 7 = 14$

d) $\sqrt[3]{5832} =$ _____ (2)

2	5832
2	2916
2	1458
3	729
3	243
3	81
3	27
3	9
3	3
	1

$\sqrt[3]{2^3 \times 3^6} =$

$\sqrt[3]{2 \times 2 \times 2 \times 3^2 \times 3^2 \times 3^2} = 2 \times 3^2 = 18$

7. How many integers are there between $\sqrt{8}$ and $\sqrt{80}$? (2)

$\sqrt{8} < 3$ $\sqrt{80} < 9$ thus 3, 4, 5, 6, 7 en 8 (6 integers)

8. Between which 2 integers will the following lie:

a) $\sqrt{12}$ Between 3 and 4

b) $\sqrt{43}$ Between 6 and 7 (2)

9. Write the following answers in exponential form.

a) $4 \times 4^1 \times 4^3$ (1) b) $3^4 \times 3^4 \times 3^4$ (1)

4^5_____ _____3^{12}_____

c) $6^3 \div 6^2$ (1) d) $10^2 \div 10$ (1)

_____6^1_____ _____10^1_____

e) $2^5 \div 2^3$ (1) f) $9^4 \times 9^2 \times 9^1$ (1)

_____2^2_____ _____9^7_____

g) 4×4 (1) h) $5^4 \times 5^2$ (1)

_____4^2_____ _____5^6_____

i) $0 \times 0 \times 0 \times 0$ (1) j) $6^2 \div 6^2$ (1)

_____0_____ _____6^0_____

k) 5^0 (1) l) $12^7 \div 12^5 \times 12^4$ (1)

_____1_____ _____12^6_____

10. Calculate the following.

a) $\sqrt{90-9} \div 9$ (1) b) $\sqrt[3]{5^3} + \sqrt[3]{1^3}$ (1)

9 ÷ 9 = 1 5 + 1 = 6

c) $\sqrt[3]{64} \times \sqrt[3]{27}$ (1) d) $\sqrt[3]{250-34} - 214$ (1)

4 x 3 = 12 6 – 214 = -208

e) $(\sqrt[3]{8})^2$+6 (1) f) $\sqrt[3]{1000000}$ (1)

4 + 6 = 10 100

g) $\sqrt[3]{8} + \sqrt{16}$ (1) h) $\sqrt[3]{25+2}$ (1)

2 + 4 = 6 3

i) $\sqrt[3]{a \times a \times a}$ (1) j) $\sqrt[3]{x^2 \times x^6}$ (1)

a x^3

Total = 55

◆ MEMORANDUM 4 Total = 30

Integers (Positive and Negative)

1. **In each case, provide the rule for the following operations with negative and positive integers**.

a) When 2 negative numbers are added together:

add up and keep the negative sign

b) When different signs (positive and negative) are added together.:

subtract and give the sign of the larger number

c) Subtraction of different signs (negative minus positive):

Change to an addition sum and change the subtractor to its opposite sign, Negative becomes positive and positive becomes negative.

d) negative x / ÷ negative = positive

e) negative x / ÷ positive = negative (5)

2. **Answered by applying order of operation**. (20)

a) 3 x (-5) + 2 x 7 = -15 + 14 = -1

b) 3 + 5 x (-2) + 7 = 3 + -10 + 7 = 0

c) 3 x (-5 + 2) – (-7) = 3 x -3 + 7 = -9 + 7 = -2

d) 3 x 3 – (-2) x (-2) x (-2) = 9- (-8) = 9 + 8 = 17

e) -7 + (-3) x (-2) = -7 + 6 = -1

f) 14 – (-12) = 14 + 12 = 26

g) 3 – 7 + 5 = -4+ 5 = 1

h) 3 – (-7) + (-5)= 3+7+(-5) = 10 +(-5) = 5

i) 64 ÷ (-8) = -8

j) 10 + (-28) ÷ (-4) 10 + 7 = 17

k) -10 – 14 = -10 + -14 = -24

l) 16 + (-4) x 4 = 16 + (-16) = 0

m) 12 x 0 + (-5) = -5

n) -5 + (-7) + 3 = -12 + 3 = -9

o) (4 + (-6)) x 3 = -2 x 3 = -6

p) -3 x (-3) x (-3) = -27

q) 3 x (-3) x (-3) = 27

r) 7 + 12 + 5 = 24

s) -5 + (-8) – (-3) = -13 + 3 = -10

t) 28 ÷ (-2) x (2) = -28

3. Calculate

a) $\sqrt[3]{-27}$ _____-3_____ (1) b) $\sqrt[2]{16} + -2^3 = -4$ (2)

c) -5^2 x -10^3 = __25 x -1000 = -25000_____ (2)

Total = 30

◆ MEMORANDUM 5 Total = 65

Fractions

1. *Match the correct answer from Column B with the word in Column A. Write only your choice from Column B with the question number of Column A.* (6)

Column A	Answer	Column B
1.1 Improper Fraction	E	A $4\frac{5}{6}$
1.2 Proper Fraction	D	B 7
1.3 Mixed Number	A	C $\frac{}{9}$
1.4 Denominator	C	D $\frac{7}{12}$
1.5 Numerator	F	E $\frac{18}{11}$
1.6 Whole Number	B	F $\frac{7}{}$

2. Simplify $\frac{18}{24}$.= $\frac{3}{4}$ (1)

3. Write $4\frac{5}{9}$ as an Improper Fraction. $\frac{41}{9}$ (1)

4. $\frac{2}{3}$ of 33= 22 (1)

5. Calculate

1. $7\frac{13}{20} - 4\frac{2}{5} =$

$= 7\frac{13}{20} - 4\frac{8}{20}$

$= 3\frac{5}{20} = 3\frac{1}{4}$

(3)

6. $3\frac{3}{5} - 1\frac{2}{9} =$

$= 3\frac{27}{45} - 1\frac{10}{45}$

$= 2\frac{17}{45}$

(3)

2. $3\frac{3}{4} + 1\frac{2}{5} =$

$= 4\frac{15}{20} + \frac{8}{20}$

$= 4\frac{23}{20} = 5\frac{3}{20}$

(3)

7. $3\frac{2}{3} + 1\frac{3}{9} =$

$= 3\frac{2}{3} + 1\frac{1}{3} =$

$= 5$

(3)

3. $3\frac{3}{5} \times 4\frac{1}{6} =$

$= \frac{18}{5} \times \frac{25}{6}$

$= \frac{3}{1} \times \frac{5}{1} = 15$

(3)

8. $\frac{12}{21} \times \frac{35}{48} =$

$\frac{1}{3} \times \frac{5}{4} = \frac{5}{12}$

(3)

4. $\frac{3}{4} \div \frac{3}{12} =$

$= \frac{3}{4} \times \frac{12}{3} = 3$

(3)

9. $1\frac{2}{16} \div 2\frac{3}{12} =$

$= \frac{18}{16} \times \frac{12}{27}$

$= \frac{2}{4} \times \frac{3}{3} = \frac{1}{2}$

(3)

5. $\left(\frac{1}{4} + \frac{2}{3}\right) \div \left(\frac{3}{4} - \frac{1}{2}\right) =$

$= \left(\frac{3}{12} + \frac{8}{12}\right) \div \frac{1}{4}$

$= \frac{11}{12} \times \frac{4}{1} = \frac{11}{3} = 3\frac{2}{3}$

(3)

10. $\left(\frac{2}{3} + \frac{3}{4}\right)$ van $1\frac{1}{17} =$

$= \left(\frac{8}{12} + \frac{9}{12}\right) \times \frac{18}{17}$

$= \frac{17}{12} \times \frac{18}{17} = \frac{3}{2} = 1\frac{1}{2}$

(3)

11. $\left(2\frac{3}{4}-2\frac{2}{3}\right)\times\left(1\frac{1}{4}+1\frac{1}{4}\right)=$ $=\left(2\frac{9}{12}-2\frac{8}{12}\right)\times\left(2\frac{2}{4}\right)$ $=\frac{1}{12}\times\frac{10}{4}=\frac{5}{24}$ (6)	12 $\frac{3}{4}$ x $\frac{8}{9}=$ — $=\frac{1}{1}\times\frac{2}{3}=\frac{2}{3}$ (2)

6.. Nicola spends $\frac{1}{2}$ hour on her English homework, $\frac{2}{3}$ hours on Math homework and 1 $\frac{1}{6}$ hours on an Afrikaans essay.

a) How many minutes does she spend on Mathematics? _____ (2)

$\frac{2}{3}\ of\ 60 = 60\ \div 3 = 40\ minutes$

b) How long does it take her to write her essay? 70 minutes (1)

c) How long does she do homework altogether? 40 + 30 + 70 = 140 min = 2-hour 20 min (3)

7. How much is $3\frac{4}{5}$ greater than the product of $\frac{3}{5}\times 1\frac{3}{4}$. Show ALL your operations (5)

$3\frac{4}{5}-\left(\frac{3}{5}\times\frac{7}{4}\right)=3\frac{16}{20}-1\frac{1}{20}=2\frac{15}{20}=2\frac{3}{4}$

8. Henry goes to town and spends $\frac{5}{8}$ of his money on a new pair of 20% off sneakers. The original price of the sneakers was R675.

a) Calculate the sale price. $\frac{8}{10}\times 675=\frac{4}{5}\times\frac{675}{1}=\frac{4}{1}\times\frac{135}{1}=R540$ (3)

b) How much money did Henry have before he bought the sneakers? (3)

$\frac{5}{8}=R540\ \ thus\ \frac{1}{8}=108\ \ thus\ \frac{8}{8}=108\times 8=R864$

c) How much money does he have left? R864 – 540 = R324 left over (1)

◆ MEMORANDUM 6 Total = 65

Decimals and Percentages

1 Write the numbers in extended notation.

a $56{,}49\mathbf{3} =$ $50 + 6 + \frac{4}{10} + \frac{9}{100} + \frac{3}{1000}$ (1)

b $\mathbf{7}{,}124 =$ $7 + \frac{1}{10} + \frac{2}{100} + \frac{4}{1000}$ (1)

c $0{,}\mathbf{6}84 =$ $\frac{6}{10} + \frac{8}{100} + \frac{4}{1000}$ (1)

d $\mathbf{2}4{,}83 =$ $20 + 4 + \frac{8}{10} + \frac{3}{100}$ (1)

e $9{,}\mathbf{1}6 =$ $9 + \frac{1}{10} + \frac{6}{100}$ (1)

2. Study the following numbers and then answer the questions.

0; 0,75; 3; $\frac{1}{3}$; 37%; 0,173; $\frac{4}{5}$; 20%; 5

2.1.1 Arrange the numbers above in ascending order.
(each wrong Answer will be marked negative ½) (2)

0,173; 20%; $\frac{1}{3}$; 37%; 0,75; $\frac{4}{5}$; 0; 3; 5

2.1.2 Write down all the integers. 0; 3; 5 (1)

2.1.3 Convert $\frac{1}{3}$ to a decimal. $0{,}\dot{3}$ (2)

2.1.4 Write 20% as a Proper Fraction. Simplify your answer. $\frac{1}{5}$ (1)

2.1.5 Write 0.75 as a Proper Fraction. (Simplify your Answer). $\frac{3}{4}$ (2)

2.2 Calculate and Simplify the following. Show how you go about it.

2.2.1 a) 18 – 3 x 5 ÷ 5 = 18 – 15 ÷ 5 = 18 – 3 = 15 (2)

b) $35 \div 5 + (18 - 6) =$ (2)

$= 7 + 12$

$= 19$

2.2.2 a) $\frac{3}{5} + 30\% - 0{,}16 =$ (2)

$= 0{,}6 + 0{,}3 - 0{,}16$

$= 0{,}9 - 0{,}16$

$= 0{,}74$

b) Write your Answer in 2.2.2a as a percentage. 74% (1)

c) Write your Answer in 2.2.2a as a Proper Fraction. $\frac{74}{100} = \frac{37}{50}$ (1)

2.3 Write only the answer in decimal form.

a) $23{,}45 \div 100 = 0{,}2345$

b) $3{,}507 \times 1000 = 3507$

c) $\frac{1}{3} \times \frac{1}{3} = 0{,}111$

d) $\frac{1}{3} + \frac{1}{3} = \approx 0{,}67$

e) $\frac{3}{10} + 0{,}5 = 0{,}8$ (5)

2.4 Round the following numbers according to the table. (6)

Number	To the closest whole number	To the closest tenth	To the closest hundredth
1,475	**1**	**1,5**	**1,48**
19, 642	**20**	**19,6**	**19,64**

3. Calculate. Provide your answer in decimal form.

a. $0{,}375 + \frac{5}{5} + 1{,}5 = 0{,}375 + 1 + 1{,}5 = 2{,}875$ (2)

b. $\frac{4}{5} + 0{,}16 + 0{,}75 = 0{,}8 + 0{,}16 + 0{,}75 = 1{,}71$ (2)

c. $0{,}125 + \frac{1}{8} + \frac{4}{5} = 0{,}125 + 0{,}125 + 0{,}8 = 1{,}05$ (2)

4. Do the following calculations. Show all your work and simplify your Answer whenever possible. All answers must be in decimal form

4.1 $345{,}05 \div 0{,}05 = x$

= 34505 ÷ 5

= 6901

(2)

4.2 $0{,}25 \times 1\frac{3}{5} = x$

$= \frac{1}{4} \times \frac{8}{5}$

$= \frac{2}{5}$

= 0,4

(3)

4.3 $1{,}543 + \frac{2}{3} = b$

1,543 + 0,67 = 2,213

(2)

4.4 $2\frac{1}{4} \times \frac{4}{8} = a$

$= \frac{9}{4} \times \frac{1}{2}$

$= \frac{9}{8}$

= 1,125

(3)

4.5 2,4 X 0,12 = a

2,4

x1,2

48 + 240 = 0,288

(3)

4.6 $5{,}472 \div 0{,}8 = a$

$54{,}72 \div 8 = 6{,}84$

(3)

5. Determine the percentage increase or decrease in the following cases.

5.1 80 to 108 = _____

$\frac{108}{80} \times \frac{100}{1} = \frac{54}{4} \; x \; \frac{10}{1} = \frac{27}{1} \; x \; \frac{5}{1} = \frac{135}{1}$

135 – 100 = 35% increase

5.2 250 to 100 = _____ (4)

$\frac{100}{250} \times \frac{100}{1} = \frac{4}{1} \times \frac{10}{1} = 40\% =$

100 – 40 is a 60% decrease

6. The sunglasses store has a 25% sale on sunglasses. Calculate the following.

a) If sunglasses cost R200, what is the new selling price?? (3)

$\frac{3}{4} \times \frac{200}{1} = \text{R}150$ new price

b) How much Rand discount was given?

(2)

R 50

7. A 17m garden hose must be cut into 4 equal parts. Calculate the length of each piece.

17 ÷ 4 = 4,25 m (2)

◆ MEMORANDUM 7 Total = 50

Ratio and Rate

1 **Write the ratios of red to blue beads as fractions**:

a) $2:5$ (2)

Red: $\frac{2}{7}$

Blue: $\frac{5}{7}$

b) $3:4$ (2)

Red: $\frac{3}{7}$

Blue: $\frac{4}{7}$

c) $3:8$ (2)

Red: $\frac{3}{11}$

Blue: $\frac{8}{11}$

d) $5:7$ (2)

Red: $\frac{5}{12}$

Blue: $\frac{7}{12}$

2 **Calculate the % Boys and % Girls in each of the following ratios**.

a) $2:4$ (2)

Boys: 33%

Girls: 67%

b) $3:7$ (2)

Boys: 30%

Girls: 70%

c) $4:5$ (2)

Boys: 44,4%

Girls: 55,6%

d) $1:3$ (2)

Boys: 25%

Girls: 75%

3. Rewrite the relationships in the simplest form:

a) $14\ l:42\ l$ = 1: 3 ℓ (1)

b) $15ml:25ml$ = 3:5 mℓ (1)

c) $150\ cm:3m$ = 1:2 cm (1)

d) $\frac{2}{5}:4 = \frac{2}{5}:\frac{20}{5}$ =1:10 (2)

4. Mrs. Barnard gathered the following information about the learners in her class:

	Right-Handed	Left-Handed
Girls	12	3
Boys	16	4

a) Write down the ratio of right-handed Boys to right-handed girls. (1)

16 : 12 = 4 : 3

b) Write down the ratio of left-handed Boys to left-handed girls. (1)

4 : 3

c) Write down the ratio of right-handed Boys to left-handed Boys. (1)

16 : 4 = 4 : 1

d) Write down the ratio of right-handed girls to left-handed girls. (1)

12 : 4 = 3 : 1

e) Write down the ratio of left-handed learners to right-handed learners. (1)

7 : 28 = 1 : 4

5. a) Increase R330 by the ratio 2:3 = 330 ÷ 2 x 3 = 495 (2)

b) Decrease R90 by the ratio 3:2 3 : 2 = 90 ÷ 3 x 2 = 60 (2)

6. Calculate:

a) Cost of 1 kg of apples if 5 kg costs R52. 52 ÷ 5 = R 10,40 (2)

b) 250km / 2½ hour = _____km / hour (2)

= 250 km in 150 min

= 25 km in 15 min

= 100 km in 60min 100km / h

c) My heart beats 56 beats per minute = _____ beats / hour (2)

56 x 60 = 560 x 6 = 3360 beats / hour

7. Last year a pancake was sold at the cake sale at R3 for a pancake. Increase the price for this year in the 6: 7 ratios. (3)

300 ÷ 6 x 7 = 50 x 7 = 350 = R3,50

8. Divide R 112 in the ratio 5: 9. 112 ÷14 = 8

5 x 8 = R 40 : 9 x 8 = R 72 (2)

9. A concrete mix is loaded at a building site. The specifications for the foundations are 1-part cement, 2½ parts river sand and 4 parts stone. If 6m^3 of the dry mixture is discharged, what are the volumes of the cement, sand and stone in the mixture respectively? (3)

1 + 2,5 + 4 = 7,5 parts

6 ÷ 7,5 = 60 ÷ 75 = 0,8

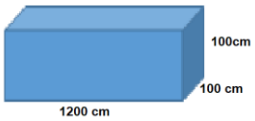
0,8 x 1 : 0,8 x 2,5 : 0,8 x 4

0,8 m^3 cement : 2 m^3 river sand : 3,2 m^3 stone

10. Calculate the rate in m^3 / sec, if the pipe that fills a pool delivers 12m^3 of water in 10min. 12: 600 = 12000000 : 600 = 120000 : 6 = 20000 cm : 1 (3)

= 20000 cm^3 in 1 sec

= 0,02 m^3 / sec



11. Calculate the distance traveled if a car was traveling at an average speed of 120km / hour after 7 hours 15 min. (3)

In 7 hour = 120 x 7 = 840 km

In 15 min 120 ÷ 4 = 30 km

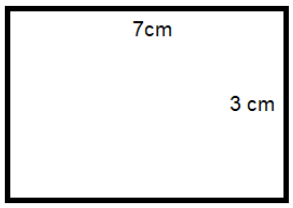
870 km in 7-hour 15 min

◆ MEMORANDUM 8 Total = 30

Functions and relationships

1 Use the given formulas and then calculate the perimeter and or area of the different shapes.

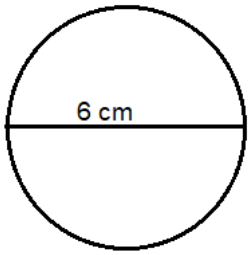
Shape	Perimeter	Surface Area
Square	4S	$S^2 = a^2$
Rectangle	**2l + 2b**	**l x b = a^2**
Triangle	**Sum of 3 sides**	**½b x h ∓ a^2**
Circle	$2\pi r$ π= 3,14	πr^2= **a^2** π= 3,14

a) 

(2)

Perimeter: 7 x 2 + 3 x 2 = 20 cm (2)

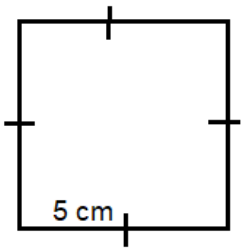
Surface Area: 7 x 3 = 21 cm^2

b) 

(2)

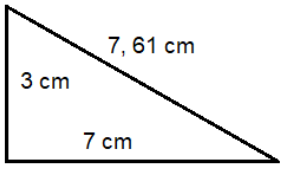
Perimeter: 2 x 3,14 x 3 = 37,68 cm (2)

Surface Area: 3,14 x 3^2 = 3,14 x 9 =28,26 cm^2

c) 

Perimeter: 5 x 4 = 20 cm (2)

Surface Area: 5 x 5 = 25 cm^2 (2)

d) 

Perimeter: 17,61 cm (2)

Surface Area: $\frac{1}{2}$ x 7 x 3 = 10,5 cm^2 (2)

2 The linear equation is given as $y = 5x + 40$.

a) $Calculate\ y\ if\ x = 6.$ y = 5 x 6 + 40 = 70 (1)

b) $Calculate\ x\ if\ y = 105.$ (2)

$105 = 5x + 40$

$5x = 105 - 40$

$x = \frac{65}{5} = 13$

c) $Calculate\ x\ if\ y = 85.$ (2)

$85 = 5x + 40$

$5x = 85 - 40$

$x = \frac{45}{5} = 9$

3. The following values are given:

$a = 5; \quad b = -3\ and \quad c = 9.$

Calculate the values of the expressions:

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

$=5 + \frac{1}{2}(9) - (-3)$

$=5 + 4{,}5 + 3$

$=12{,}5$

b $4c(a - b)$ (3)

$= 4 \times 9(5 - (-3)$

$= 36(8)$

$= 288$

c) $\frac{-4ac}{2b}$ (3)

$= \frac{-4x5x9}{2(-3)}$

$= \frac{-180}{-6}$

$= 30$

◆ MEMORANDUM 9 Total = 45

Patterns

1. Explain:

   a) What is meant when it is said that a pattern has a constant difference? The same Number is added to or subtracted from a term each time to find the next term. (2)

   b) What is meant when a pattern is said to have a constant ratio? Each time the same Number is multiplied or divided to find the next term. (2)

2. Calculate the following two terms in each number pattern.

   a) 6; 14; 22; 30; 38; 46;...

   b) 1; 2; 4; 8; 16; 32; 64; ...

   c) 1; 2; 4; 8; 14; 22;...

   d) 1; 3; 9; 27; 81; 243 (8 x ½)

3. Use the rule to find the first four terms in each number pattern.

   a) Start at 3 and add 2 each time. (2)
   3; 5; 7; 9;...

   b) Start at 1 and double every time.
   1; 2; 4; 8; .... (2)

   c) Start at 1000 and multiply by 1/2 each time.
   1000; 500; 250; 125; ... (2)

4. Study the following sequences. describe the rule of each in your own words and then use the rule to determine the 10th term of that row.

   a) 4; 8; 12; 16; ...

   Rule: Start at 4 and add 4 each time / Multiply place in the row by 4

   10th term 40 (3)

   b) 1; 4; 9; 16; ...

   Rule: Start at 1 and multiply place in the row by himself / squared place in the row

   10th term: 100 (3)

c) 5; 8; 11; 14

Rule: Start at 5 and add 3 each time

10th term = 32 (3)

5. a) Use the rule **m = 2n + 3** to complete the following table. (4)

n	5	6	a) 12	b) 18
M	c) 13	d) 15	27	39

b) Calculate the value of m if n = 201 m = 405 (1)

6. Study the following pattern and then answer the questions.

Input (a)	1	2	3	4	**12**	**20**	***Z***
output (b)	5	9	13	17	x	***y***	**121**

a) Describe the pattern in words. (1)

Start at 5 and add 4 each time

b) Write the rule of the pattern as an expression. 4n + 1 (1)

c) Find the values of:

i. x = 4 x 12 + 1 = 49 (1)

ii. y = 20 x 12 + 1 = 241 (1)

iii. z = (121- 1) ÷ 4 = 30 (1)

7. Study this dots design

a) Draw the fourth design.

b) Write down the rule you used to expand the

1) Black dots Squares the place in the row / n^2 (2)

2) Light/Red Dots: Start at 3 and add 2 / 2n + 1 each time (2)

c) Complete the given table to compare the number of dark spots with the light spots. (12 x½)

Pattern	1	2	3	4	5	10
Light/Red Dots	3	5	7	9	11	21
Black dots	1	4	9	16	25	100

◆ MEMORANDUM 10 Total = 50

Algebraic Expressions and Equations

1. Study the expression and answer the questions. (3)

2a + 7

a) a is the variable.

b) 2 is the coefficient.

c) 7 is the constant.

2. Write the following expressions in **words.**

a) 2(a + b) Add 2 variables and multiply by 2. (1)

b) 6y – 1 Multiply a variable by 6 and subtract 1. (1)

c) 10 - (y + 3) The difference between 10 and the sum of a variable and 3. (1)

3. Resolve the unknown if $a = 3, b = 5$ *and* $c = -4$:

a) $a + b \times c$ (2)

=3 + 5 x -4

=3 + -20

= -17

b) $a - 3b$ (2)

=-4 – 3x5

= -4 -15

= -19

c) $c^2 - ac + 12$ (2)

$=(-4)^2 - 3(-4) + 12$

=16 – (-12) + 12

= 28 + 12

= 40

d) $3a + 3b - 2c$ (2)

= 3x3 + 3x5 – 2(-4)

= 9 + 15 + 8

= 32

4. Solve for x:

a) $x + 9 = 14$ (2)

$x = 14 - 9 = 5$

b) $48 = 39 - x$ (2)

$48 - 39 = -x$

$x = -9$

c) $135 = 5x + 10$ (2)

$5x = 135 - 10$

$x = \frac{125}{5} = 25$

d) $\frac{4x}{9} = 8$ (2)

$4x = 8 \times 9$

$x = \frac{72}{4} = 18$

e) $\frac{y}{4} + 12 = 17$ (3)

$y = 4(17 - 12)$

$y = 20$

f) $x^2 - 23 = -7$ (2)

$x^2 = -7 + 23$

$x = \sqrt{16} = 4$

5. Resolve the unknown if $c = 4; d = -5$ *and* $e = 2$:

a) $-d + (e^2 \times d)$ (2)

= -(-5) + 4(-5)

= 5 + -20

= -15

b) $c - 5c + e \times d$ (3)

= 4 - 5(4) + 2(-5)

= 4- 20 + -10

= -26

c) $4e^2 \times e + cd - e$ (3)

= 4(8) + 4(-5) – 2

= 32 + (-20) – 2

= 10

d) $2d + \frac{c}{e}$ (2)

= 2(-5) + $\frac{4}{2}$

= -10 + 2

= -8

6. Write the following as expressions. (5)

a) A number is reduced by 4 to power 2. $x - 4^2$

b) 12 is divided by an unknown number and added to 14. $14 + \frac{12}{x}$

c) Twelve less than a Number. $x - 12$

d) 9 is added to the Square of a variable. $9 + x^2$

e) 7 less than the sum of 2 unknown numbers. (a + b) - 7

7. Determine the value of the following expressions:

a) $4mno - 2mn + o, as\ m = 5, n = 8\ en\ o = 2.$

= 4x5x8x2 – 2x5x8 + 2

= 320 – 80 + 2

= 240 + 2 = 242 (4)

b) $3(a-c)-4(2a+b-4c), as\ a=2, b=7\ en\ c=3.$ (4)

= 3(-1) – 4(4+ 7 – 12)

= -3 – 4(-1)

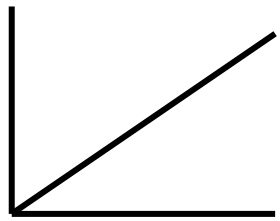
= -3 + 4

= 1

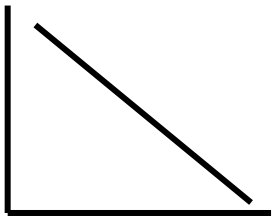
◆ MEMORANDUM 11 Total = 35

Graphs

Line graphs consist of an X and Y axis

1. The y-axis is the Vertical line. (1)
2. The x-axis is the Horizontal line. (1)
3. The variable shown on the y-axis is known as the dependent variable. (1)
4. The variable shown on the x-axis is known as the independent variable. (1)
5. Linear graphs are a) straight line graphs where the relationship between the dependent and independent variable is a b) constant / different increase or decrease. (2)
6. 

   Linear Graph that a)
   Increases in value

   Linear Graph that b)
   Decreases in value

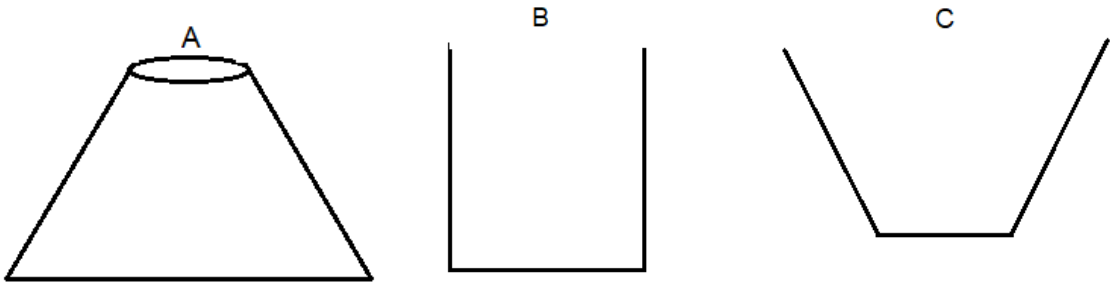
   (2)

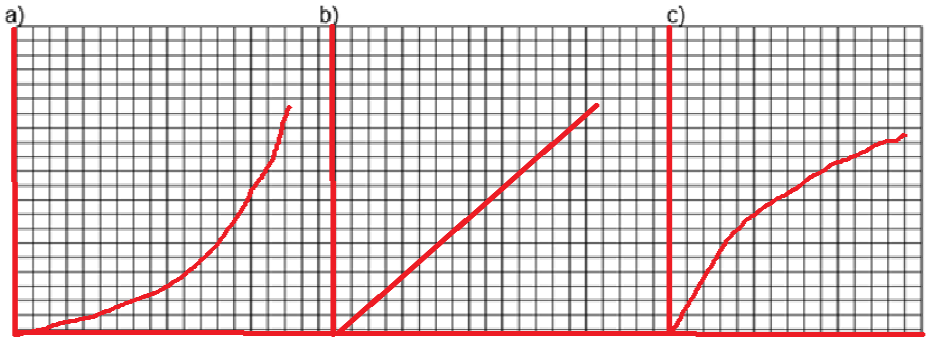
7. A constant value graph is indicated by an a) straight line running b) horizontally to the x-axis.

(2)

8. Water drips into three containers, A, B and C, at a constant rate. The containers are shown below. Draw a graph to show how the water level in the containers will differ over time.

(6)



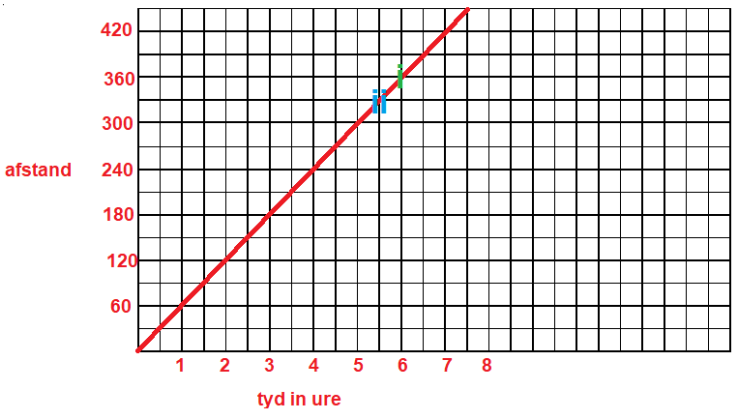


Speed (S):	60	60
Time (T):	2	3
Distance (D):	120	180

9. The distance (km) traveled by a car is calculated by the following formula:

Distance (D) = Speed (S) × Time (T)
Time is measured in hours..

(a) Present the information on a graph. (3)



(b) Is the car's speed constant? Motivate your answer. (2)

Yes, moving at a constant speed of 60km / h Straight line graph (c) In which unit is the speed measured? km/h (1)

(d) Use your graph and answer the following questions.

Indicate on the graph where you made the readings.

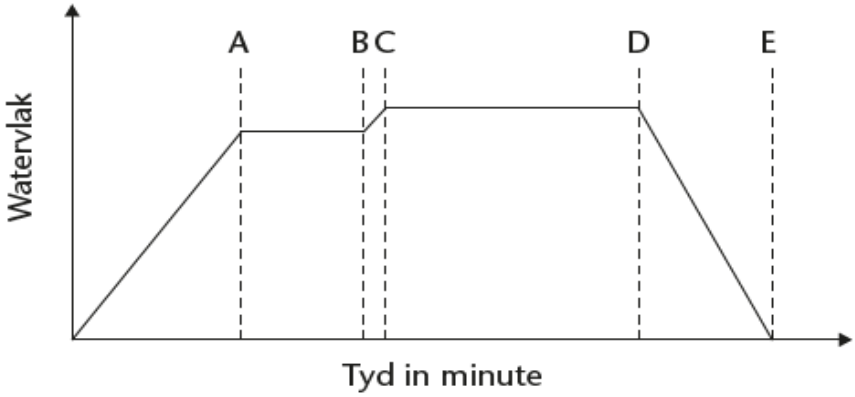
(i) What distance will be covered after 6 hours? 360 km (1)

(ii) How long will it take the car to cover 330 km? 5 h 30 min (1)

10. After a difficult training session, Petru ran herself a nice full bath. While the water was running in, she brushed her teeth so she could get in bed straight after.

This graph shows how the level of water in the bath changes.

Take a close look at the graph and describe what you think happened using the different Alphabet letters. (5)



Beginning until A Water running in

A-B Water had already run in, but she had not yet entered

B-C She climbs in and the water level rises

C-D She lies and relaxes in the bath

D-E Get out and let the water run out

11. a) Draw a graph to illustrate the following events:

During a rainstorm, Riëtte put a measuring cup outside to measure how much it was raining. After 10 minutes of heavy rain, there was 200 mℓ in the cup. It started to rain softer, and after another 20 minutes there was 250 mℓ in the cup. When Riëtte went to look 20 minutes later there was 280ml in the measuring cup. 30 minutes later she went to look again, but there was no change. (5)

b) Is it a linear or a non-linear graph? Non-linear (1)

◆ MEMORANDUM 12 Total = 60

Geometry

1. Complete the following by writing down the missing words:

a) An angle of 215 ° is called a reflex angle.

b) The sum of the interior angles of a Triangle is equal to 180 °.

c) A triangle whose one angle is 90 ° is called a right-angled Triangle.

d) A triangle whose two sides are the same length is called an isosceles triangle.

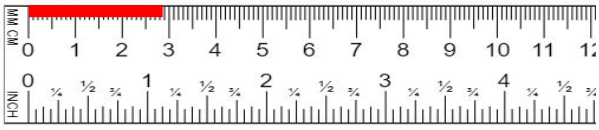
e) A quadrilateral of which all sides are equal, but the angles are not equal is called a rhombus. (5)

2. Measure and label the following angles:

a) 70° b) 266° c) 126° (3)

3. Draw:

a) Draw line segment AB 30 mm long. (1)

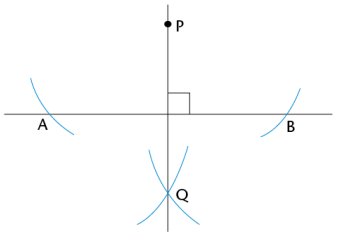


K L

b) Draw KL || OP. (1)

O P

c) Use your compass and ruler and construct PQ ⊥ AB (2)

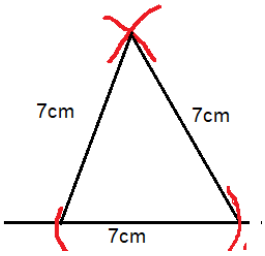


4. Give the name of each angle as well as a description in degrees.

Angle	Name of Angle	Degrees
	a) Acute Angle	b) between 0 and 90°
	c) Right Angle	d) Equal to 90°
	e) Obtuse Angle	f) Between 90° and 180°
	g) Straight Angle	h) 180°
	i) Reflex Angle	j) Between 180° and 360°

(10)

5. Use your compass and ruler to draw an equilateral triangle with lengths of 7cm. (2)



6. What shape properties are described here?

(Square, Rectangle, Parallelogram or Kite)

a) Four angles of 90 ° each.

Two pairs of opposite sides are equally long and parallel. (1)

Square, Rectangle and parallelogram

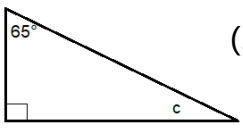
b) Two pairs of opposite angles are equal. The angles are not 90 °. (1)

Two pairs of opposite sides are equally long and parallel.

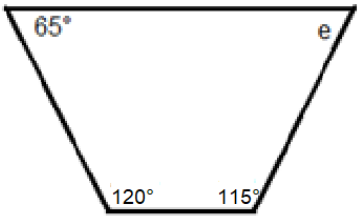
Parallelogram

7. The Triangle below is not drawn to scale. Calculate the size of angle c

180 – 90 – 65 = 25° (1)



8. The quadrilateral below is not drawn to scale. Calculate the magnitude of angle e.



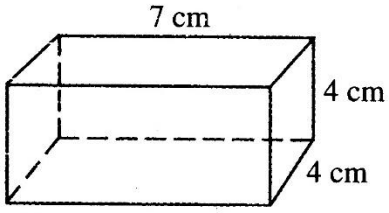
360 – 65 – 120 – 115 = 60°

Angel e = 60°

(1)

9.

a) Name the 3-D Shape.



Rectangular prism

b) Calculate the volume of the Shape. (2)

$7 \times 4 \times 4 = 112\ cm^3$

c) Determine the outer surface area of the Shape.

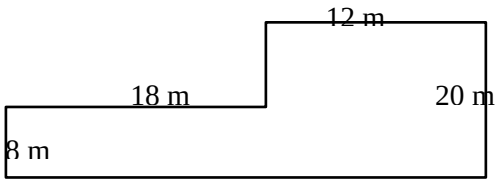
(4)

$= 4 \times 7 \times 4 + 2 \times 4^2$

$= 112 + 32$

$= 144\ cm^2$

10. Study the following figure of the school yard and then answer the questions that follow.



a) Calculate the Surface Area of the school grounds. _____ (3)

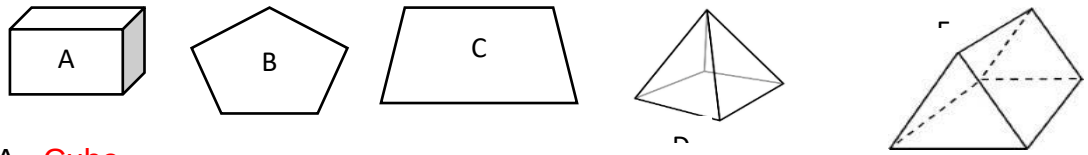
=18 x 8 + 12 x 20

= 144 + 240 = 384m^2

b) Calculate the Perimeter of the school grounds. _____ (2)

= 8 + 18 + 12 + 20 + 30 = 88m

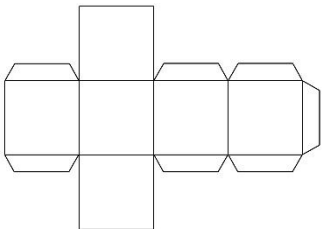
11. Name the following figures: (5)



A. Cube
B. Pentagon
C. Trapezium
D. Square based pyramid
E. Triangular Prism

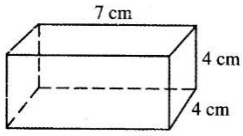
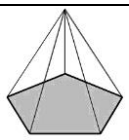
12. Which 3D shapes can be folded from the following template?

(2)

a)  Cube

b) pentagonal pyramid / pentagon-based pyramid 

13. Complete the table on the given shapes (8)

13.1.	Name	Total Faces	Total Corners	Total Edges
	a. rectangular prism	b. 6	c. 8	d. 12
13.2 	a. Pentagonal pyramid	b. 6	c. 6	d. 10

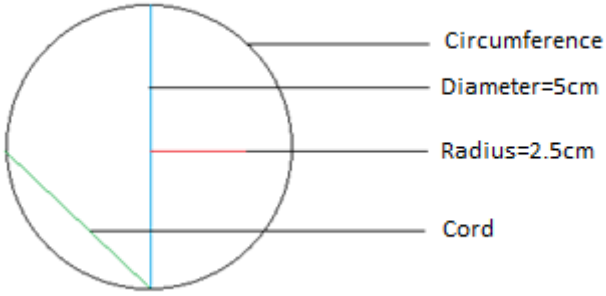
14. Draw a Circle with a diameter of 5cm and indicate the following. (6)

a) Diameter

b) radius

c) Cord

d) Circumference



15. Calculate the Perimeter of the Circle in Question 14.

(2)

$2\pi r = 2 \times 3,14 \times 2,5 = 5 \times 3,14 = 15,7$ cm

16. Calculate the area of the Circle in Question 14. _____ (3)

$\pi r^2 = 3,14 \times 2,5^2 = 3,14 \times 6,25 = 19,625$ cm^2

◆ MEMORANDUM 13 Total = 60

Data Handling

1. The following is a presentation of Pieter's Mathematics results (%) for the year.

67; 45; 65; 69; 56; 65; 76; 65; 70; 54; 65; 67; 70; 72; 75;

a) Organize the data using a stem and leaf graph. (4)

stem	leaf
4	5;
5	4;6
6	5;5;5;5;7;7;9
7	0;0;2;6;5

b) What is the highest% he has achieved? 75% (1)

c) What is the lowest% he has achieved? 45% (1)

d) Name and explain the median of the data? 67% The middle value. There are just as many tests with a lower performance than with a higher performance than that of the median. (2)

e) Name and explain the mode of the data? 65% the results that are most prevalent (2)

f) What is the average of the data? (2)

$\frac{67+45+65+69+56+65+76+65+70+54+65+67+70+72+75}{15}$ = 65,4 %

g) Calculate and explain the scope / distribution of the data? Difference between the best and worst results = 75 – 45 = 30% (2)

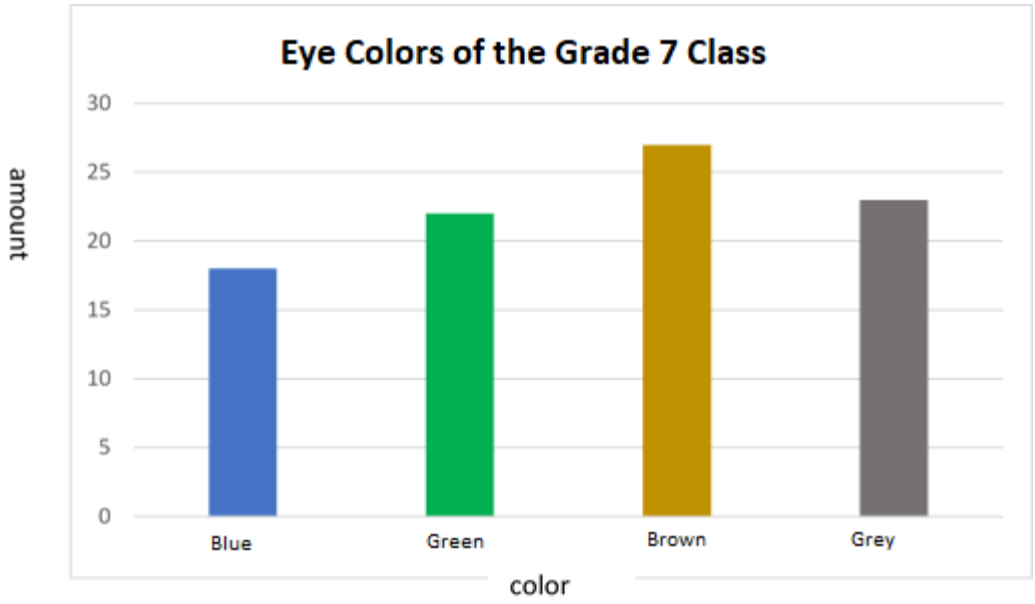
2. Jasper made the following survey about the color of the children in his grade's eyes. a) Complete the table. (5)

Eye Color	Frequency	Total
BLUE	𝍸 𝍸 𝍸 | | |	18
GREEN	𝍸 𝍸 𝍸 𝍸 | |	22
BROWN	𝍸 𝍸 𝍸 𝍸 𝍸 | |	27
GREY	𝍸 𝍸 𝍸 𝍸 | | |	23
	Total	90

b) What fraction of the class has brown eyes? (Simplify) $\frac{27}{90} = \frac{3}{10}$

of the class have brown eyes (2)

c) Represent the information on a bar graph, (8)

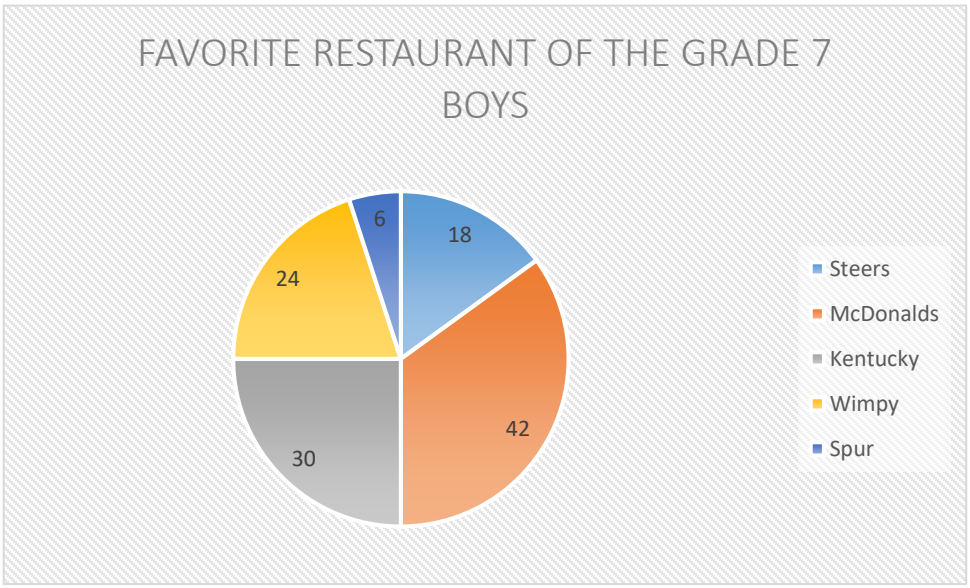


3. Aneske and Heleen had to do research to find out which fast food restaurants in town are most popular with the learners.

Complete the table below (24)

Favorite restaurant with learners from Vorentoe Primary School						
Restaurant	Boys			Girls		
		Fraction of Total	° sector on pie chart		Fraction of Total	° sector on pie chart
Steers	18	$\frac{3}{20}$	18 x (360÷120) = 54°	27	$\frac{3}{10}$	27 x 4 = 108
McDonalds	42	$\frac{7}{20}$	42 x 3 = 126°	18	$\frac{2}{10} = \frac{1}{5}$	18 x 4 = 72
Kentucky	30	$\frac{5}{20} = \frac{1}{4}$	30 x 3 = 90°	18	$\frac{2}{10} = \frac{1}{5}$	72
Wimpy	24	$\frac{4}{20} = \frac{1}{5}$	24 x 3 = 72°	18	$\frac{2}{10} = \frac{1}{5}$	72
Spur	6	$\frac{1}{20}$	6 x 3 = 18°	9	$\frac{1}{10}$	36
Total	120	$\frac{20}{20}$	360°	90	$\frac{10}{10}$	360°

b. Use a compass and protractor to draw a pie chart for the Boys (7)



GOOD LUCK WITH YOUR EXAM!