

Exam exemplar (June)

Paper 1: Algebra

Marks: 75

Instructions

- Answer all the questions.
- Show all your workings.
- Work neatly and write legibly.

Question 1

Classify each of the following numbers according to all the sets to which they belong. Place a tick in the relevant boxes.

Number	$\mathbb{N}$ Natural	$\mathbb{Z}$ Integer	$\mathbb{Q}$ Rational	$\mathbb{Q}'$ Irrational
$-\frac{3}{7}$				
$\sqrt{5}$				
$\frac{3}{7}$				
$-\sqrt{16}$				

[6]

Question 2

2.1 Write each of the following in scientific notation:

2.1.1 4 620 000

(1)

2.1.2 0,000237.

(1)

2.2 The total area of Africa is $\pm 29\,820\,000\text{ km}^2$.

Write this area in scientific notation.

(1)

2.3 The distance from Earth to the Sun is approximately 149 600 000 km.

Express this in scientific notation correct to two decimal places.

(2)

2.4 Use a calculator to determine the value of the following: $\frac{99\,999 \times 88\,888}{431}$

Give the answer in scientific notation correct to 3 decimal places.

(2)

[7]

Question 3

Examine the following rows:

$$1 + 2 = 3$$

$$4 + 5 + 6 = 7 + 8$$

$$9 + 10 + 11 + 12 = 13 + 14 + 15$$

$$16 + 17 + 18 + 19 + 20 = 21 + 22 + 23 + 24$$

$$25 + 26 + 27 + 28 + 29 + 30 = 31 + 32 + 33 + 34 + 35$$

- 3.1 Give the first term in the 7th row. (3)
 3.2 Give the first term in the n th row. (3)
 3.3 Determine the term that appears right after the equals sign in the 25th row. (4)
 [10]

Question 4

Simplify the following without the use of a calculator. Write your answers with positive exponents where necessary. Show all your workings.

- 4.1 $(3^0 \cdot 7)^2 + (7 \cdot 3^2)^0$ (2)
 4.2 $5^6 \div 5^2$ (2)
 4.3 $(2x^2)^2$ (2)
 4.4 $-3a \times 3a \times 3a$ (2)
 4.5 $\frac{(pr^2)^2}{p^2r^7}$ (2)
 4.6 $\frac{8a^3b^{-2}c^7}{12a^5b^{-4}c^7}$ (3)
 [13]

Question 5

Solve for x in each of the following equations.

- 5.1 $2x + 7 = 6x - 9$ (2)
 5.2 $2(x - 3) - 3(2x - 1) = 17$ (3)
 5.3 $\frac{2x+1}{2} - 3 = \frac{x-1}{4}$ (5)
 [10]

Question 6

6.1 Arrange the following in order from smallest to largest.

$0,60; -0,300; \frac{-1}{4}; \frac{2}{3}; \frac{31}{20}; 1\frac{1}{2}$ (3)

6.2 Express each fraction as either a recurring or terminating decimal number.

6.2.1 $\frac{4}{7}$

6.2.2 $\frac{6}{20}$

6.2.3 $\frac{13}{6}$

6.2.4 $\frac{20}{21}$ (4)

6.3 Express each decimal number as either a proper fraction or a mixed number in its simplest form.

6.3.1 0,65

6.3.2 $1\dot{2}$

6.3.3 $30,\dot{5}\dot{1}$ (5)

[12]

Question 7

- 7.1 The table below shows the coordinates of some points on the straight line $y = 2x - 3$. Copy the table and complete it. (3)

x	-2	-1	0	1	
y		-5		-1	7

- 7.2 Represent the equation $y = 2x - 3$ as a flow diagram. (2)
- 7.3 The coordinates of the points $A(x; 5)$ and $B(-3; y)$ lie on the straight line $y = 3x + 2$. Determine the values of x and y . (2)
- [7]

Question 8

- 8.1 Cedric paid R310 per month for three years on hire purchase for a flat-screen TV. If the TV cost R10 000 cash, how much interest did he pay? (2)
- 8.2 Stan saves at Sunbank where he gets 9,45% interest per annum compounded annually on his investment. If he invests R3 000, how much will be in his account in four year's time? (4)
- 8.3 Walter needs R2 800 in 18 months' time. He wonders what the rate of simple interest per annum at Wonderbank would be if he invests R2 000 today. Find the interest rate. (4)
- [10]

Paper 2: Geometry

Marks: 80

Instructions

- Answer all the questions.
- Show all your workings.
- Work neatly and write legibly.
- Use $\pi = 3,14$ where appropriate.
- Round all answers to two decimal places.

Question 1

- 1.1 Construct an equilateral triangle with sides equal to 70 mm. (3)
- 1.2 Bisect each angle to form six angles of 30° each. (3)
- [6]

Question 2

2.1 $\angle ACD$ is the exterior angle of $\triangle ABC$.

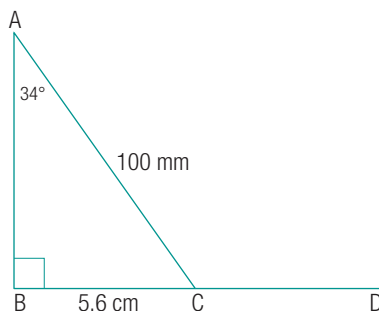
$\hat{A} = 34^\circ$. Calculate, giving reasons:

2.1.1 the size of $\angle ACB$

2.1.2 the size of $\angle ACD$

2.1.3 the length of BC in mm

2.1.4 the length of AB .



(4)

(4)

(2)

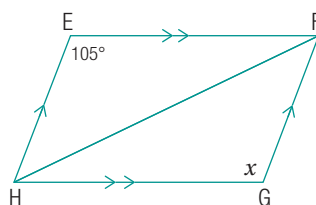
(4)

2.2 In the diagram alongside, EFGH is a parallelogram with diagonal FH.

$\hat{E} = 105^\circ$.

2.2.1 Write down, giving reason(s), the value of x .

2.2.2 Prove that $\triangle HEF \equiv \triangle HGF$.



(2)

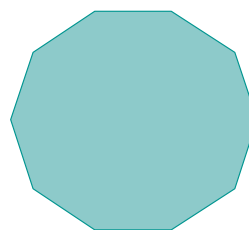
(6)

2.3 The polygon alongside is a decagon.

2.3.1 How many sides does the polygon have?

2.3.2 How many triangles can a decagon be divided into?

2.3.3 Calculate the sum of the interior angles of a decagon.



(1)

(2)

(4)

[29]

Question 3

3.1 In the diagram alongside, $\triangle ABC$ is equilateral. D is the midpoint of AB . $DE \parallel BC$ and intersects AC at F. $BC = 40$ mm.

3.1.1 Write down, giving reason(s), the size of $\hat{A}$.

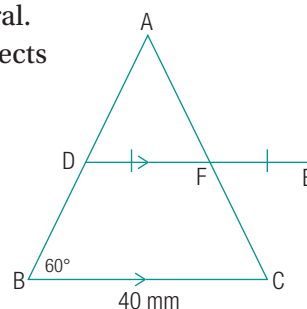
3.1.2 Write down, giving reason(s), the size of $\angle ADF$.

3.1.3 Calculate the length of FE .

3.1.4 Calculate the size of $\angle FCE$.

3.1.5 Show that $\triangle ABC \parallel \triangle ADE$.

3.1.6 Give reasons why $\triangle AFD \equiv \triangle CFE$.



(2)

(4)

(5)

(5)

(5)

(4)

3.2 This house below is a rondavel.



You are allowed to build a house with the maximum floor area on a piece of land with a perimeter of 30 m.

3.2.1 Copy and complete the following table in your exercise book.

House shape	Dimensions	Perimeter (Circumference)	Area
Square	Side =	30 m	$A = \square$
Rectangle Width =	Length = 10 m Width =	30 m	$A = \square$
Circle	Radius =	30 m	$A = \square$

(15)

3.2.2 Which shape in question 3.2.1 gives the maximum area?

(1)

3.2.3 The circumference of the rondavel in question 3.2.1 is doubled.

Calculate the floor area of the new rondavel.

(4)

[45]