



GAUTENG PROVINCE
EDUCATION
REPUBLIC OF SOUTH AFRICA

**GAUTENG DEPARTMENT OF EDUCATION
PROVINCIAL EXAMINATION
NOVEMBER 2020
GRADE 10**

**MATHEMATICS
(PAPER 1)**

**TIME: 1 hour
MARKS: 50**

5 pages

INSTRUCTIONS AND INFORMATION

1. This question paper consists of **SIX** questions.
2. Answer **ALL** the questions.
3. Clearly show **ALL** calculations, diagrams, graphs etc. which were used in determining the answers.
4. Answers **ONLY** will not necessarily be awarded full marks.
5. An approved scientific calculator (non-programmable and non-graphical) may be used, unless otherwise stated.
6. Diagrams are **NOT** necessarily drawn to scale.
7. Where necessary, answers should be rounded off to **TWO** decimal places, unless otherwise stated.
8. Number your answers according to the numbering system used in this question paper.
9. Write neatly and legibly.

QUESTION 1

For which value(s) of x is the expression:

$$A = \sqrt{\frac{9}{11-x}}; x \in \{11; -5; 0; 15\}$$

- 1.1 rational (1)
1.2 non-real (1)
1.3 undefined (1)
[3]

QUESTION 2

Simplify the following:

- 2.1 $\frac{x^2+x-6}{3x^2-12x} \times \frac{x^2-16}{x^2-2x^2} \times \frac{1}{x+4}$ (5)
2.2 $\frac{6^{2-a} \cdot 12a}{2^{a+2}}$ (4)
2.3 If $a^2 + b^2 = 8ab$; determine the value of $(a+b)^2$ in terms of a and b . (3)
[12]

QUESTION 3

Factorise the following completely:

- 3.1 $64p^3 - \frac{1}{27}$ (2)
3.2 $24ky^3 - 6ky - 24y + 96y^3$ (4)
[6]

QUESTION 4

4.1 Solve for x :

$$\left(\frac{1}{3}\right)^{3x+3} = 729 \quad (3)$$

4.2 Solve for x and write the answer in interval notation:

$$-4 \leq \frac{1-x}{3} < 3 \quad (4)$$

4.3 Tickets for a school concert are sold at R6 for children and R10 for adults. If altogether 150 children and adults attend the concert and pay R1 100 entrance fee, determine how many children attend the concert.

(4)
[11]

QUESTION 5

5.1 Consider the following pattern:

−3; 1; 5; 9; ...

5.1.1 Determine the general term. (2)

5.1.2 Calculate T_{38} (1)

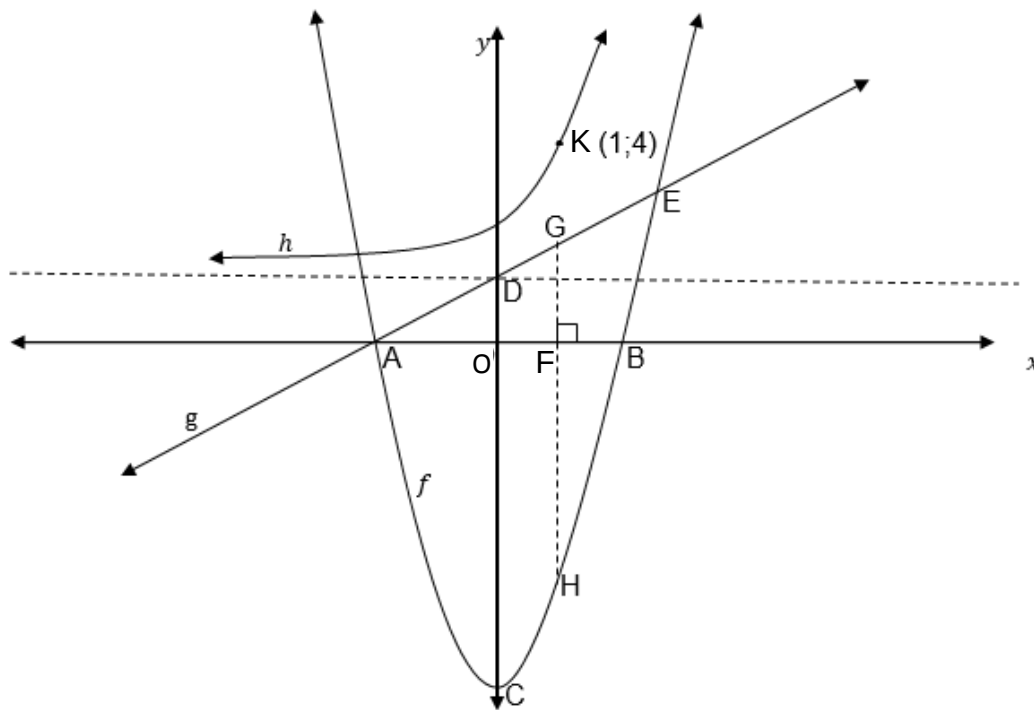
[3]

QUESTION 6

In the given sketch, the following graphs are represented:

$$f(x) = 3x^2 - 12, \quad g(x) = x + 2 \quad \text{and} \quad h(x) = a^x + q.$$

A and B are the x -intercepts and C is the turning point of f . D is the y -intercept of g . K (1 ; 4) is a point on the graph of h .



- 6.1 Calculate the length of GH if $OF = 1$ unit. (3)
- 6.2 Determine:
- 6.2.1 the coordinates of E, the point of intersection of f and g (5)
- 6.2.2 the equation of h (3)
- 6.2.3 k if k is the reflection of f about the x -axis (2)
- 6.3 For which value(s) of x will $f(x) \geq 0$. (2)

[15]

TOTAL: 50

END