Name and Surname : .....

Grade/Class : 11/..... **Mathematics Teacher** : .....

Hudson Park High School

GRADE 11

MATHEMATICS

JUNE PAPER 1

Marks : 100 Date : 5th June 2026

Time : 2hr

Examiner : VNT Moderator(s) : SLT, PHL, VPT

INSTRUCTIONS

1. Illegible work, in the opinion of the marker, will earn zero marks.
2. Number your answers clearly and accurately, exactly as they appear on the question paper.
3. **NB** ∘ **Leave *2 lines* open between each of your answers.**
   ∘ **Start each new Question at the top of a page.**
4. **NB** ∘ **Hand in your submission in the following manner :**
   - **Answer on lined paper. Answer pages MUST be stapled together.**
   - **Question paper must NOT be stapled to the answer script.**
5. Employ relevant formulae and show all working out.
   Answers alone *may* not be awarded full marks.
6. (Non-programmable and non-graphical) Calculators may be used, unless their usage is specifically prohibited.
7. Round off answers to 2 decimal places, where necessary, unless instructed otherwise.
8. If (Euclidean) GEOMETRIC statements are made, REASONS must be stated appropriately.
9. Answer in blue or black ink. An HB pencil may be used for all diagrams and graphs

QUESTION 1:

1.1 Solve for x:

1.1.1 $x(2x-7)=-3$ (3)

1.1.2 $x(6x+1)<12$ (4)

1.1.3 $x-\frac{1}{x}=1$ (correct to two decimal places) (4)

1.1.4 $3\sqrt{2-x}+2x=5$ (5)

1.1.5 $3x^{-\frac{7}{5}}+4=0$ (2)

1.1.6 $x^{\frac{4}{3}}=7$ (1)

1.1.7 $5.2^{2x-1}-2^{2x}=4$ (4)

1.2 Write the following expression in the form $a(x-p)^2+q$ by completing the square.

$6x^2+24-42x$ (3)

1.3 Solve for x and y:

$x-2y=1$ and $x^2-2y+3xy=6$ (6)

[32]

QUESTION 2:

2.1 Simplify the following expressions **without the use of a calculator.**

2.1.1 $\frac{\sqrt{50}+\sqrt{8}}{7\sqrt{2}}$ (3)

2.1.2 $\frac{(3-\sqrt{3})^2}{\sqrt{3}\sqrt{6}}$ (Leaving your answer in the form $a\sqrt{b}-\sqrt{c}$ *where* $a,b,c\in\mathbb{N}$) (5)

2.2 Given: $\frac{4^{x-1}+4^{x+1}}{17.12^x}$

2.2.1 Simply the expression fully (4)

2.2.2 Hence, if $3^{-x}=4t$, express $\frac{4^{x-1}+4^{x+1}}{17.12^x}$ in terms of t (1)

[13]

QUESTION 3:

3.1 Without solving the following equation, discuss the nature of roots.

$$8x^2 = 2x + 1$$ (3)

3.2 Prove that the following equation,

$$mx^2 - m - x^2 = -2x - 3$$

Has real roots for all values of m. (5)

3.3 Given: $f(x) = x + k$ and $g(x) = x^2 - 2$

For which value(s) of k will $g(x)$ be a tangent to $f(x)$ (4)

[12]

QUESTION 4:

Consider the following quadriatic pattern $-7; 0; 9; 20$ ...

4.1 Show that the general term of the quadratic pattern is given by $T_n = n^2 + 4n - 12$ (3)

4.2 Which term of the quadratic number pattern is equal to 128 (4)

4.3 Determine the general term of the first differences of the given quadratic pattern. (2)

4.4 Between which two terms of the quadratic number pattern will the first difference be 2009 (3)

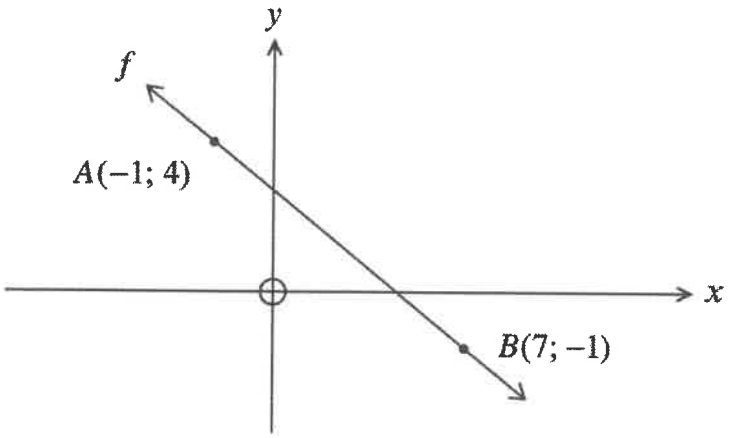
[12]

QUESTION 5:

5.1 Sketch a rough graph of $y = x$ (3)

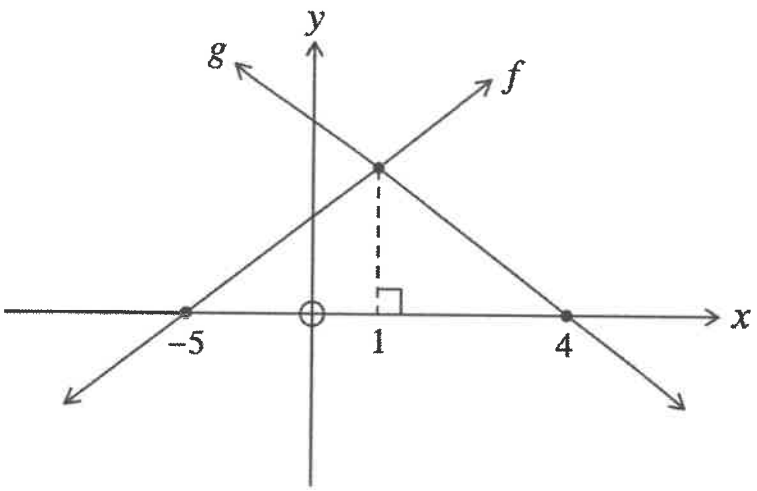
5.2 Write down the equation of the x-axis (1)

5.3



Determine the equation of f in the form $ax + by + c = 0$, where $a, b, c \in \mathbb{R}$ (4)

5.4 Given : $f(x) = mx + c$ and $g(x) = nx + d$



5.4.1 Use the graphs to solve for x if :

(a) $f(x) \geq 0$ (1)

(b) $f(x) - g(x) < 0$ (2)

(c) $(mx + c)(nx + d) > 0$ (2)

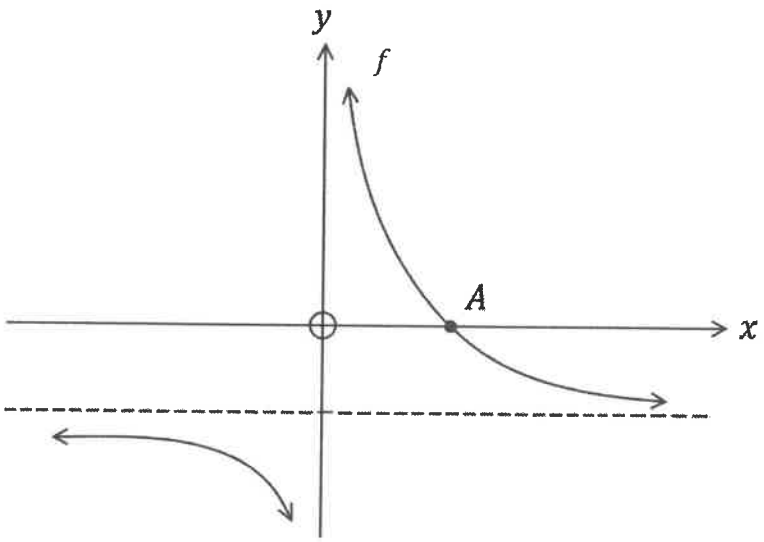
(d) $x.g(x) \leq 0$ (2)

5.4.2 Write down the domain of f (1)

[16]

QUESTION 6:

Given : $f(x) = \frac{3}{x} - 2$



6.1 For f, determine the

6.1.1 coordinates of A (2)

6.1.2 equation of the horizontal asymptote. (1)

6.1.3 equation of the vertical asymptote. (1)

6.1.4 equation of the axis of symmetry with a negative gradient (2)

6.1.5 the range (2)

6.2 Use the graphs to solve for x if :

6.2.1 $f(x) \geq 0$ (2)

6.2.2 $f(x) + 2 < 0$ (1)

6.3 If $f(x)$ is reflected in the x-axis and then translated vertically upwards by 3 units to become g, state the equation of g in y-form. (3)

6.4 If $f(x)$ is reflected in its horizontal asymptote to become h, state the equation of h in y-form. (1)

[15]

TOTAL 100 MARKS