GRADE 12 MATHEMATICS
NOVEMBER EXAMINATION PAPER 1

QUESTION 1

1.1 Solve for x

    1.1.1 $x^2 - 9x + 20 = 0$ (3)

    1.1.2 $x(x + 3) - 1 = 0$ (correct to 2 decimal points)   (3)

    1.1.3 $x^2 + 7x < 0$ (3)

    1.1.4 $2x^{\frac{2}{3}} = 64$ (4)

1.2 Solve simultaneously for x and y if:

$$2x - y = 8, \text{ and}$$
$$x^2 - xy + y^2 = 19$$
       (7)

1.3 Solve the expression below without the use of a calculator: (4)

$$\frac{\sqrt{4^{2024}} + \sqrt{4^{2022}}}{\sqrt{16^{2022}}}$$

[24]

QUESTION 2

2.1 The terms p; $(2p + 2)$; $(5p + 3)$ form an arithmetic sequence.

Determine:

    2.1.1   The value of p.   (4)

    2.1.2   The rule in the form of $a_n = a + (n - 1)d$.   (2)

    2.1.3   The 15th term of the sequence.   (4)

2.2 x; y; 81 is a geometric sequence.
And $y = 2x - 5$
All terms in the sequences are integers.
Calculate the values of x and y.   (10)

[20]

QUESTION 3

Given the sequence 2; 6; 10; 14; ....

3.1 What type of sequence is this? Justify your answer by calculation.   (2)

3.2 Calculate T_{12}.   (3)
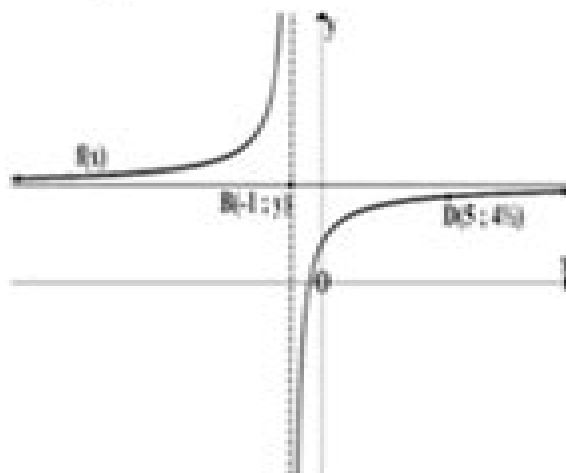
3.3 Which term has a value of 322?   (3)

3.4 Determine by calculation if 1204 is a term in the sequence?   (4)

[12]

QUESTION 4

The sketch below shows the graph of $f(x) = \frac{-1}{x+p} + q$. The asymptotes of f intersects at $B(-1; y)$. The Point $D\left(5; 4\frac{1}{2}\right)$ is a point on the graph.

4.1 Determine the value of p.   (1)

4.2 Proof that $q = 5$.   (2)

4.3 Calculate the x-intercept of f.   (2)

4.4 Determine the equation of the vertical asymptote of h if $h(x) = f(x + 4)$ (2)

4.5 One of the symmetry axes of f is an increasing function. Determine the equation of the symmetry axis.   (3)

4.6 Give the values x for $f(x) \geq x + 6$.   (2)

4.7 Determine the equation of g, the reflection of f in the x-axis and move two units to the right.   (3)

[15]

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