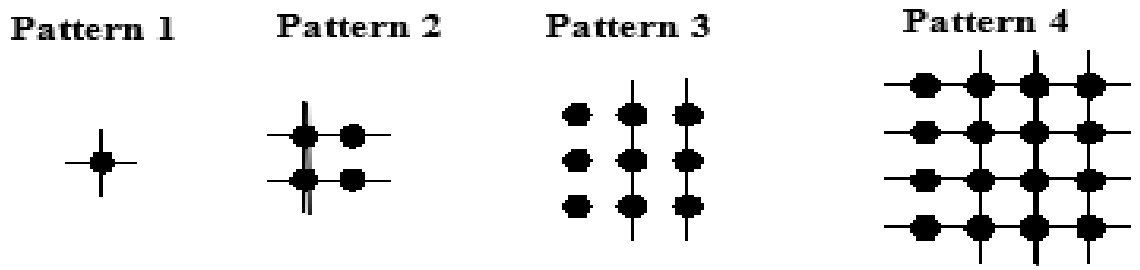
GRADE 11 INFORMAL TEST 1

DO THE FOLLOWING INFORMAL TEST IN YOUR BOOKS. IT SHOULD TAKE ABOUT 30 MINUTES.

QUESTION 3

3.1 Study the following pattern formed by circles and matches:



3.1.1 Complete the table by writing down the answer next to the number of the question. (4)

Pattern number	1	2	3	4	5
Number of circles	1	4	9	**3.1.1.1**	**3.1.1.2**
Number of matches	4	12	24	**3.1.1.3**	**3.1.1.4**

3.1.2 Write down a formula for the number of circles in the n-th pattern. (1)

3.1.3 Determine the general term (T_n) which represents the number of matches in any pattern. (4)

3.1.4 Which pattern will use 1 104 matches? (4)

3.2 Calculate: $\frac{3}{2} \times \frac{4}{3} \times \frac{5}{4} \times \ldots\ldots\ldots \times \frac{2\,009}{2\,008} \times \frac{2\,010}{2\,009}$. (2)

3.3 Study the following pattern:

***GRADE*11*GRADE*11*GRADE*11*GRADE*11.....**

Which letter or number will be the 388th term in the pattern? (2)

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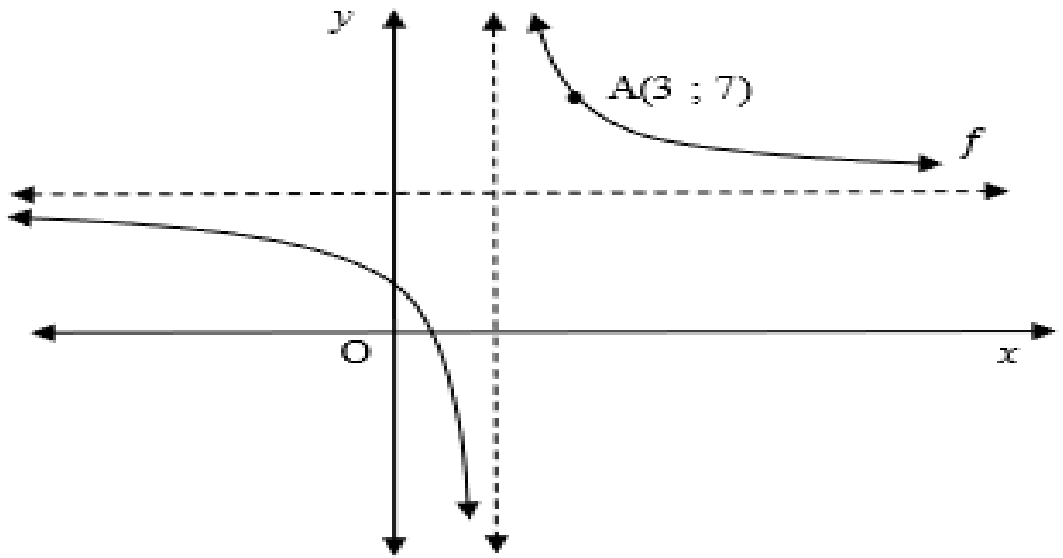
QUESTION 6

6.1 The diagram below represents the graph of $f(x) = \frac{p}{x-2} + 4$.

A(3 ; 7) is a point on the graph of f.



6.1.1 Write down the equations of the asymptotes of f. (2)

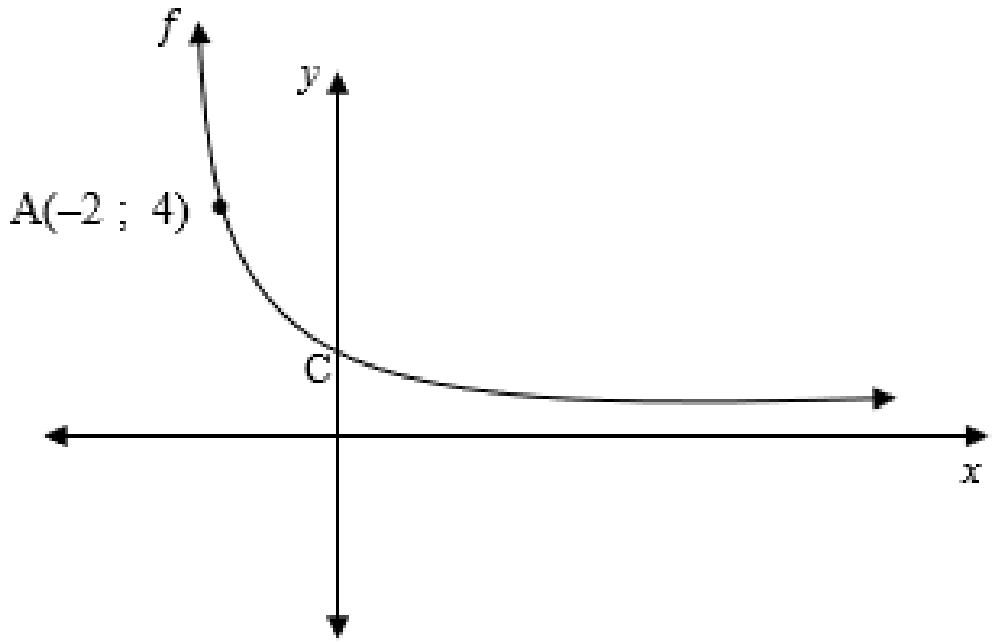
6.1.2 Show that $p = 3$. (2)

6.1.3 Determine the equation of h which is formed when f is shifted three units downwards and one unit to the left. (2)

6.1.4 For which value(s) of x is f decreasing? (2)

6.2 The diagram shows the graph of $f(x) = a^x$.

The point $A(-2\ ;\ 4)$ lies on the graph. C is the y-intercept of f.



Determine:

6.2.1 the value of a. (2)

6.2.2 the coordinates of C. (2)

6.2.3 the average gradient of the curve between the points A and C. (3)

[15]