GRADE 11

FINAL ASSESSMENT PAPER 1

NOVEMBER 2015

TOTAL: 150

TIME: 3 hours

INSTRUCTIONS

1.   This question paper consists of 10 questions.

2.   Answer all the questions.

3.   Clearly show all calculations used to solve problems.

4.   You may use an approved scientific calculator, unless stated otherwise.

5.   If necessary, round off answers correct to two decimal places.

6.   Diagrams are not necessary drawn to scale.

7.   Number the answers according to the questions.

8.   Write neatly and legibly.

QUESTION 1:

1.1 Solve for x:

1.1.1 $(-x+4)(x+5)=0$ (2)

1.1.2 $x^2 - 6x = 3$, correct to two decimal places. (4)

1.1.3 $\sqrt{x+5} - 3 = 4$ (4)

1.1.4 $3x^2 - 2x - 8 \leq 0$ (4)

1.2 Solve the equations simultaneously:

$(x-2y)(2x+y) = 12$ and $7y - x + 9 = 0$ (6)

1.3 Solve for x:

$$2(x-2)^{-\frac{3}{2}} = \sqrt{108}$$ (3)

1.4 Use the solution for $k - \dfrac{3}{k} = 2$ to solve x if $3^x - 3^{1-x} - 2 = 0$. (6)

[29]

QUESTION 2:

2.1 Simplify without using a calculator:

$\dfrac{3^{2003} - 3^{2001}}{3^{2003}}$ (4)

2.2 $f(x) = \dfrac{\sqrt{x-3}}{x+1}$

2.2.1 For which value(s) of x will $f(x)$ be undefined? (2)

2.2.2 For which value(s) of x will $f(x)$ be non real? (2)

2.3 Simplify the expression:

$\dfrac{10^x . 25^{2x} . 8^x}{40^x}$ (4)

[12]

QUESTION 3:

The perimeter of a square is 16x.

3.1   Determine the length of a side for the square.   (2)

3.2   Hence, determine the area of the square if $x = 2$ cm.

                                                                  (3)
                                                                  [5]

QUESTION 4:

4.1   Use the given number pattern:
        -9 ; -3 ; 10 ; 30 ; 57 ; 3 432

4.1.1   Determine the general term for the given pattern.   (4)

4.1.2   Which term will be 297?   (4)

4.1.3   Determine the general term for the first differences.   (3)

4.2   Use the following number pattern:
        1 ; 3 ; 7 ; 15 ; 31

4.2.1   Determine the general term for the given number pattern.   (2)

4.2.2   Calculate the value of the eighth term.   (2)
                                                                  [15]

QUESTION 5:
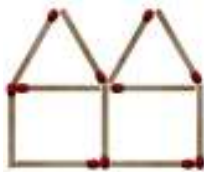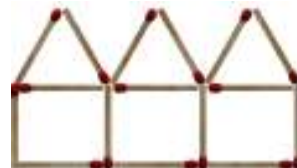
5.   Use the given picture pattern to answer the questions.

Figure 1   **Figure 2**   **Figure 3**

5.1   Determine the nth term for the given pattern.   (3)
5.2   How many matches will be used for T_{20}?   (2)

5.3   Determine the biggest number of matches needed if the pattern will use less than 518 matches.   (2)

[7]

QUESTION 6:

6.   Given: $f(x) = \dfrac{-8}{x+2} - 3$

6.1   Write down the equations of the asymptotes for f.   (2)
6.2   Calculate the x- and y-intercepts of f.   (3)
6.3   Sketch the graph of f.   (3)
6.4   If $y = -x + k$ the equation of the symmetry of f, determine the value of k.   (2)
6.5   What is the domain and the range for f.   (4)
6.6   Determine the equation of h where h is the reflection of f in the x-axis.   (2)
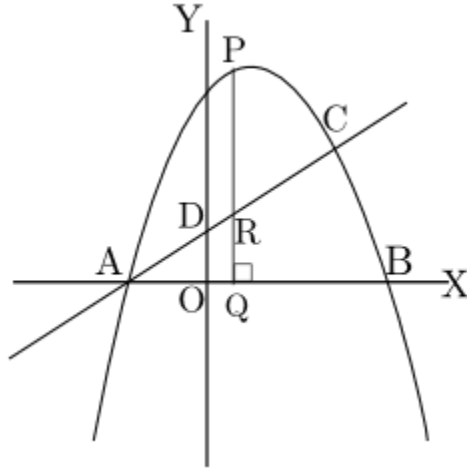
[16]

QUESTION 7:

7.   The diagram represents $g(x) = -4.2^{x+2} + 4$.
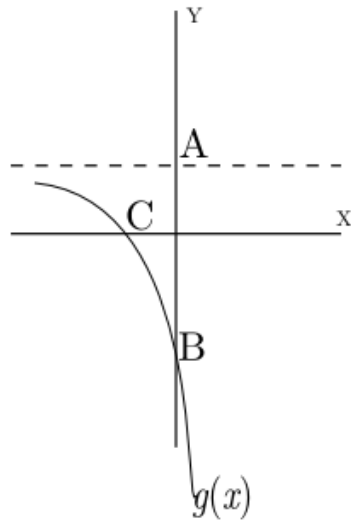
7.1   Determine the coordinates of A, B and C.   (6)
7.2   Determine the average gradient between B and C.   (4)
7.3   Find the equation of h where h is the reflection of g in the Y-axis.   (2)
7.4   For which value(s) of x will $g(x) = h(x)$?   (2)
7.5   Determine the x-intercept of h.   (2)

[16]

QUESTION 8:

8.1 The diagram shows $f(x) = -x^2 + 10x + 24$ and $g(x) = 2x + 4$.

8.1.1 Calculate the length of AB. (4)

8.1.2 Calculate the coordinates of C. (3)

8.1.3 Determine the coordinates of the turning point of f by using completion of the square. (5)

8.1.4 Determine the length of PR if OQ = 3. (3)

8.1.5 For which value(s) of x will $\dfrac{f(x)}{g(x)} > 1$? (3)

8.1.6 Write down the equation of $h(x)$ if $f(x)$ moves two units to the right and three units down. (3)

8.1.7 Determine the equation of $q(x)$, the reflection of $h(x)$ in the x-axis. (2)

[23]

QUESTION 9:

9.1 Thando deposit R120 000 in the bank and receive 9% compounded interest per annum over 12 years. How much money will be in the account after eight years? (3)

9.2 Thomas borrows R70 000 at the bank and pays 12% per annum interest which is compounded over 5 years. How much interest will he pay over the 5 years? (4)

9.3 R400 000 is deposited in a bank account. After 2 years R20 000 was withdrawn. Interest for the first 3 years was 18% p.a. compounded
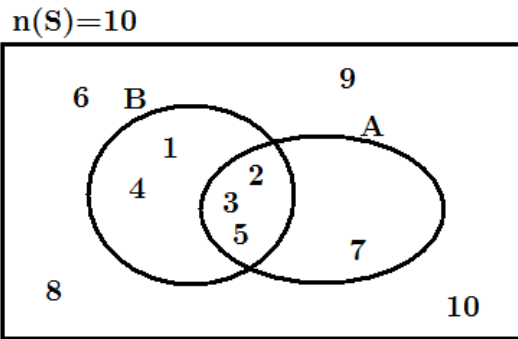
monthly and thereafter 18% p.a. compounded semi-annually. Calculate the balance in the account after 5 years. (5)

[12]

QUESTION 10:

10.1 What is the probability to get a yellow pin(E) from a bag that contains 5 yellow(E), 6 pink(P) and 7 green(G) pins? (3)

10.2 Determine the probability that the picked pin will be green or pink. (2)

10.3 S = {1 ; 2 ; 3 ; .... ; 10}. Use the Venn diagram to answer the questions.

n(S)=10

10.3.1 $P(A \cup B)$ (2)

10.3.2 $P(A' \cap B)$ (2)

10.4 If $P(A) = 0,25$; $P(B) = 0,5$; $P(A \cap B) = 0,15$, calculate

10.4.1 $P(A \cap B')$ (2)

10.4.2 $P(A \cup B)$ (3)

[15]

TOTAAL: 150