MARITZBURG COLLEGE

JUNE

EXAMINATIONS

TIME :120 MINUTES **MARKS:120**

MATHEMATICS

JUNE 2019

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MODERATOR: K GUISE- BROWN

1. Write your name and teacher's name on your answer booklet.
2. This question paper consists of 6 questions.
3. Answer ALL the questions.
4. Clearly show ALL calculations, diagrams, graphs et cetera that you have used in determining your answers.
5. Answers only will not necessarily be awarded full marks.
6. You may use an approved scientific calculator (non-programmable and non-graphical), unless stated otherwise.
7. If necessary, round answers off to TWO decimal places, unless stated otherwise.
8. Number the answers correctly according to the numbering system used in this question paper.
9. Write legibly and present your work neatly.

QUESTION 1

Simplify the following and leave your answers with positive exponents where applicable.

1.1 $2a^2 \times 6a^5$ (2)

1.2 $\frac{2^9}{2^5}$ (2)

1.3 $\frac{15a^2b}{13ab} \div \frac{20a^5b}{39}$ (3)

1.4 $6x^{-2} \times \frac{x^4}{12}$ (2)

1.5 $2y^0 - (2y)^0$ (1)

1.6 $2^{-1}a^0b^2c^{-2}$ (3)

1.7 $m^{x-3} \times m^{x-2}$ (3)

[16]

QUESTION 2

Consider the following expression:

$$-\frac{3}{4}x^5 + 2x^2 - x^3 + 4$$

2.1 Classify the polynomial (1)

2.2 Give the constant term. (1)

2.3 Give the degree of the polynomial (1)

2.4 Write down the co-efficient of x^3 (1)

2.5 Arrange the polynomial in descending powers of x (1)

2.6 Calculate the value of $-\frac{3}{4}x^5 + 2x^2 - x^3 + 4$ when $x = 2$ (2)

2.7 Subtract $x^2 - 2x + 2$ from $-3x^2 + 2 + 9x + 2x^3$ (3)

[10]

QUESTION 3

Simplify:

3.1 $ab^2 - 2a^2b - 8ab^2 + 4a^2b - 2ab^2$ (2)

3.2 $3a^2b^2c(3a^2 - 4b - c)$ (3)

3.3 $(x-4)(x+4)$ (2)

3.4 $(4x-3)(2x+1)$ (2)

3.5 $2(x-2)^2$ (3)

3.6 $(-2x^3y^2)^3$ (2)

3.7 $\sqrt{\frac{36(xy^2)^3}{x}}$ (3)

3.8 $(x-4)^2-x(x-3)$ (3)

3.9 $(2a-3)^2-(3a+1)^2$ (4)

3.10 $\left(\frac{x}{2}+\frac{y}{4}\right)^2$ (3)

[27]

QUESTION4

Factorise fully:

4.1 $10a+2ab$ (2)

4.2 $8t^2-4t$ (2)

4.3 $9a^2-16$ (2)

4.4 x^2-x-6 (2)

4.5 $2a(b-c)-3(b-c)$ (2)

4.6 $4x^4-4$ (3)

4.7 $2x^2-8x+8$ (3)

4.8 $5p(m-n)-6(n-m)$ (3)

4.9 $100-\frac{x^2}{4}$ (2)

[21]

QUESTION 5

Simplify:

5.1 $\frac{x+4}{3x}\div\frac{x^2-16}{6x}$ (3)

5.2 $\frac{x^2-2x}{x^2-4}$ (3)

5.3 $\frac{5x}{2y}+\frac{3y+1}{4}$ (2)

5.4 $\frac{4x}{2}-\frac{2x+1}{4}+\frac{3-x}{3}$ (5)

5.5 $\frac{b-a}{a-b}$ (2)

[15]

QUESTION 6

6.1 Solve for x:

6.1.1 $4x-7=6x+19$ (2)

6.1.2 $x(x-4)=0$ (2)

6.1.3 $2.4^x=16$ (3)

6.1.4 $5(x-2)=3(4x+2)+x$ (3)

6.1.5 $x^2-7x+6=0$ (2)

6.1.6 $5x-4\geq 6x-8$ (2)

6.1.7 $x-\frac{2x-1}{4}=4$ (3)

6.1.8 $px-m=3x$ (3)

6.1.9 $2(x+3)=2x+6$ (3)

6.1.10 $\frac{2(x-4)}{5}=1-\frac{3-x}{4}$ (4)

6.2 A grandfather is 50 years older than his grandson. Five years ago he was 6 times as old as his grandson was then. Write down an equation, and calculate how old the grandfather is now? (4)

[31]