education

Department of
Education
FREE STATE PROVINCE

GRADE 10

MARKS: 50

TIME: 1 hours

This question paper consists of 4 pages

INSTRUCTIONS AND INFORMATION

Read the following instructions carefully before answering the questions.

1. This question paper consists of 4 questions.
2. Clearly show ALL calculations, diagrams, graphs, etc. that you have used to determine your answers.
3. Answers only will NOT necessarily be awarded full marks.
4. If necessary, round off answers to TWO decimal places, unless stated otherwise.
5. Diagrams are NOT necessarily drawn to scale.
6. You may use an approved scientific calculator (non-programmable and non-graphical), unless stated otherwise.
7. An information sheet with formulae is included at the end of the question paper.
8. Write neatly and legibly.

QUESTION 1

1.1 Show that $0,75$ is rational number. (1)

1.2 Round 34,4678 off to two decimals (1)

1.3 Consider the following numbers: $\sqrt{25}$; $\sqrt{-7}$; π

Which one of the following numbers is:

1.3.1 Irrational (1)

1.3.2 Rational (1)

1.3.3 Non-real (1)

1.4 Determine two positive integers between which $\sqrt{33}$ lies. (2)

1.5 Simplify completely

1.5.1 $3x(2x-4xy)$ (2)

1.5.2 $(x-3)^2$ (2)

1.5.3 $(2r-p)(3r^2-4rp+p^2)$ (3)

[14]

QUESTION 2

2.1 Factorize completely

2.1.1 $2x^2-8$ (2)

2.1.2 x^2-4x+3 (2)

2.1.3 $2px+3qx-2py-3qy$ (3)

2.2 Simplify

$$\frac{27x^3-8}{27x^2+18x+12}$$ (4)

[12]

QUESTION 3

3.1 Solve for x

3.1.1 $(2x+1)(x-3)=0$ (2)

3.1.2 $3^x = 1$ (2)

3.1.3 $-4 \leq 3x-1 \leq 5$ (represent your answer graphically) (4)

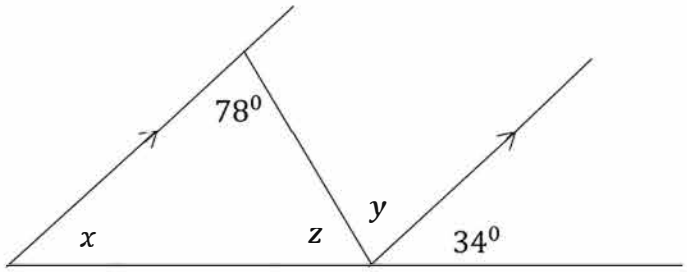
3.1.4 $9^{2x+3} = 27^{x+5}$ (4)

3.2 Solve for x and y simultaneously $2x - y = -1$ and $x + 2y = 12$ (4)

[16]

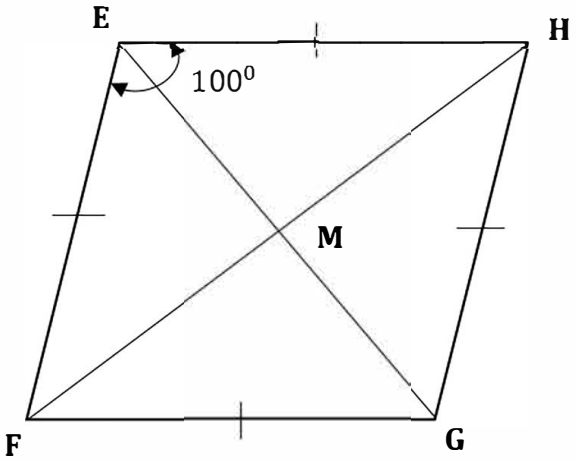
QUESTION 4

4.1 Find the values of x, y and z in the diagram below. Give a reason for each statement.



(5)

4.2 EFGH is a rhombus in which the diagonals EG and FH intersect at M. $F\hat{E}H = 100^o$



Find the value of:

4.2.1 $F\hat{E}M$ (2)

4.2.2 $E\hat{F}M$ (2)

[9]

TOTAL: 50

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GRADE 10

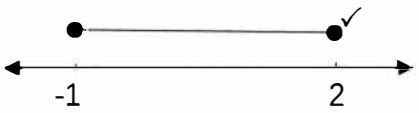
MATHEMATICS

MEMORANDUM
MARCH TEST

MARKS: 50

TIME: 1 HOUR

QUESTION 1			
1.1	0,75 $= \frac{75}{100}$ ✓ $\frac{3}{4}$		$\frac{75}{100}$ ✓ OR $\frac{3}{4}$ ✓ (1)
1.2	34,4678 = 34,47		✓ answer (1)
1.3			
	1.3.1	π	✓ answer (1)
	1.3.2	$\sqrt{25}$	✓ answer (1)
	1.3.3	$\sqrt{-7}$	✓ answer (1)
1.4	Find two positive integers between which $\sqrt{33}$ lies. $\sqrt{25} < \sqrt{33} < \sqrt{36}$ ✓ $5 < \sqrt{33} < 6$ ✓ $\therefore \sqrt{33}$ lies between 5and 6		✓ $\sqrt{25} < \sqrt{33} < \sqrt{36}$ ✓answer (2)
1.5	1.5.1	$3x(2x-4xy)$ $= 6x^2 - 12x^2y$	distribution law ✓ $6x^2$ ✓ $-12x^2y$ (2)
	1.5.2	$(x-3)^2$ $= (x-3)(x-3)$ ✓ $= x^2 - 6x + 9$ ✓	✓ $(x-3)(x-3)$ ✓ $x^2 - 6x + 9$ (2)
	1.5.3	$(2r-p)(3r^2 - 4rp + p^2)$ $= 6r^3 - 8r^2p + 2rp - 3r^2p + 4rp - p^3$ $= 6r^3 - 11r^2p + 6rp^2 - p^3$	✓ $6r^3 - 8r^2p + 2rp$ ✓ $-3r^2p + 4rp - p^3$ ✓ $-11r^2p$ and $+6rp^2$ (3)
			[14]
QUESTION 2			
2.1	2.1.1	$2x^2 - 8$ $= 2(x^2 - 4)$ ✓ $= 2(x+2)(x-2)$ ✓	✓HCF of 2 ✓brackets (2)
	2.1.2	$x^2 - 4x + 3$ $= (x-3)(x-1)$ ✓✓	✓✓Factors (2)

	2.1.3	$2px+3qx-2py-3qy$ $=(2px-2py)+(3qx-3qy)$ ✓ $=2p(x-y)+3q(x-y)$ ✓ $=(2y+3q)(x-y)$ ✓ **OR** $=(2px+3qx)+(-2py-3qy)$ ✓ $=x(2p+3q)-y(2p+3q)$ ✓ $=(x-y)(2p+3q)$ ✓	✓Grouping ✓Common factor for two brackets ✓answer (3)
	2.2	$\frac{27x^3-8}{27x^2+18x+12}$ $=\frac{(3x-2)(9x^2+6x+4)}{3(9x^2+6x+4)}$ ✓✓ $=\frac{3x-2}{3}$ ✓	✓✓Factorising numerator ✓Factorising denominator ✓answer (4)
			[11]
QUESTION 3			
3.1		Solve for x:	
	3.1.1	$(2x+1)(x-3)=0$ $(2x+1)=0$ or $(x-3)=0$ $x=-\frac{1}{2}$ ✓ or $x=3$✓	✓$x=-\frac{1}{2}$ or ✓$x=3$ (2)
	3.1.2	$3^x=1$ $3^x=3^0$ $x=0$	✓$3^x=3^0$ ✓answer (2)
	3.1.3	$-4\le 3x-1\le 5$ $-4+1\le 3x\le 5+1$ $-3\le 3x\le 6$ ✓ $-1\le x\le 2$ ✓✓  	✓simplification ✓-1 ✓2 ✓graphical representation (4)
	3.1.4	$9^{2x+3}=27^{x+5}$ $3^{2(2x+3)}=3^{3(x+5)}$ ✓ $3^{2x+6}=3^{3x+15}$ ✓ $4x+6=3x+15$ ✓	✓same base ✓simplifying ✓equating exponents

		$x = 9$ ✓	✓answer (4)
	3.2	$2x - y = -1$.....(1) and $x + 2y = 12$ .....(2) $x = -2y + 12$ .....(3) Substitute equation 3 into equation 1 Eq 1: $2(-2y + 12) - y = -1$ ✓ $-4y + 24 - y = -1$ $-5y = -25$ $y = 5$ ✓ Eq 3: $x = -2(5) + 12$ $x = 2$ ✓	✓Making x subject of the formula ✓Subt eq 3 into 1 ✓ $y = 5$ ✓ $x = 2$ (4)
			[16]
QUESTION 4			
4.1		Statement $x = 34^{\circ}$ (Corrsp $\angle$s =)✓ $y = 78$ (Alt $\angle$s =)✓ $z = 180 - 112$ ✓ (Int $\angle$ of Δ or a $\angle$s on straight line are suppl)✓ $z = 68^{\circ}$ ✓	✓S & R ✓S & R ✓S ✓R ✓answer (5)
4.2	4.2.1	FEM = 50 ✓ (Diagonals of rhombus bisect at the vertex $\angle$s)✓	✓S ✓R (2)
	4.2.2	EFM = 180 – (50 + 90) (sum of $\angle$s in Δ)✓ EFM = 40^0 ✓	✓S ✓R (2)
			[9]