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education

Department of
Education
FREE STATE PROVINCE

GRADE 8

MATHEMATICS

TEST

SEPTEMBER 2022

DURATION: 1 HOUR

MARKS: 50

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INFORMATION AND INSTRUCTIONS

Read the following instruction carefully before answering the questions

1. Answer ALL questions

2. Clearly show All calculations, diagrams, graphs, etc that you used to determine the answers.

3. Answers ONLY will NOT necessarily be awarded full marks unless stated otherwise.

4. Diagrams are NOT necessarily drawn to scale.

5. You may use an approved scientific calculator (non-programmable and non-graphical) unless stated otherwise.



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QUESTION 1

1.1 Add $(3x^2 + 2x - 1)$ and $(2x^2 + x + 9)$ (2)

1.2 Subtract $(5x^3 + 7x^2 - 2x)$ from $(-3x^3 - 7x + 4)$ (2)

1.3 Simplify the following expressions

1.3.1 $\left(-2x^2\right)^3$ (1)

1.3.2 $\dfrac{9x^2y + xy}{xy}$ (3)

1.3.3 $\sqrt{14x^{16} + 2x^{16}}$ (2)

1.3.4 $5(m^2 - 5) + m^2 + 25$ (2)

1.4 What is the value of: $\dfrac{10x - 5x^2}{5x}$ if $x = 5$ (3)

[15]

QUESTION 2

Solve for x

2.1 $-8 + 7x = 6x + 4$ (2)

2.2 $2(x+1) = 10$ (3)

2.3 $5^{x+1} = 125$ (3)

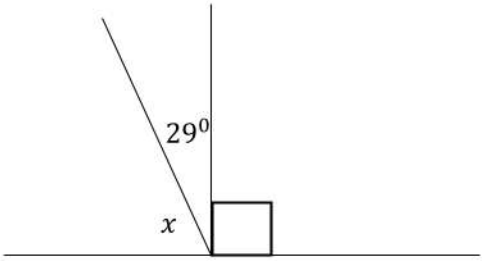
2.4 Sam is twice as old as Lerato and the sum of their ages is 48 years. Determine Sam's age (4)

[12]

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QUESTION 3

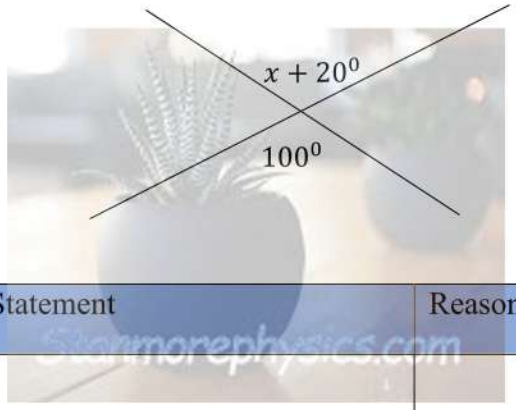
3.1 Calculate the size of x



(2)

Statement	Reason

3.2 Calculate the size of x

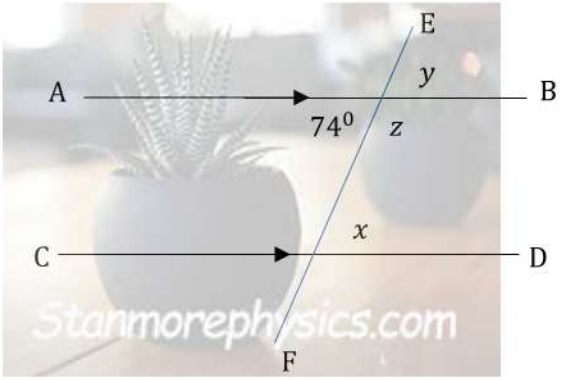


(2)

Statement	Reason

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3.3 Determine the size of x, y and z in the figure below



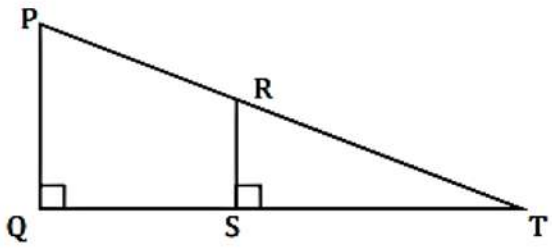
(6)

Statement	Reason

[10]

QUESTION 4

4.1 Name the triangles that are similar in the diagram below

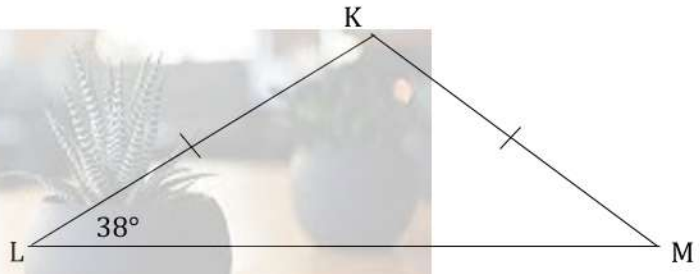


(1)

4.2 Write down any two conditions of congruency (2)

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4.3 In the diagram below, ΔKLM is an isosceles triangle.
KL = KM and $\hat{L} = 38°$



4.3.1 Write down, with a reason, the size of $\hat{M}$ (2)

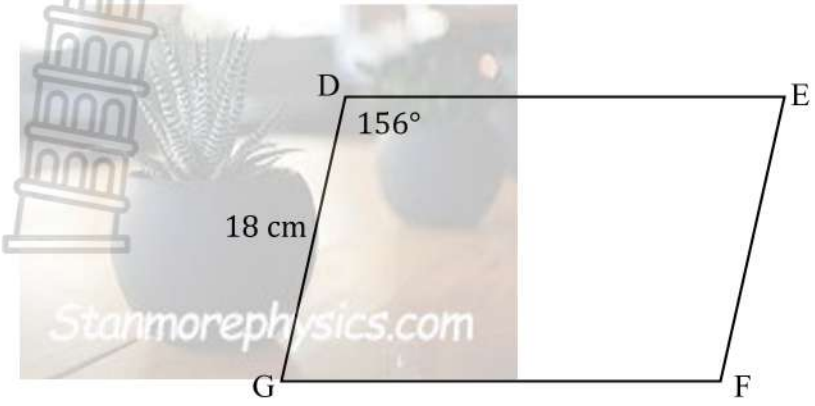
Statement	Reason

4.3.2 Hence, calculate the size of $\hat{K}$ in the figure above (2)

Statement	Reason

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4.4 In the figure below, DEFG is a rhombus with DG = 18 cm and $\hat{D} = 156°$



Determine, with reasons

4.4.1 The size of $\hat{F}$ (2)

Statement	Reason

4.4.2 The size of $\hat{E}$ (2)

Statement	Reason

4.4.3 The length of DE (2)

Statement	Reason

[13]

GRAND TOTAL: [50]

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MARKING GUIDELINES

Note:

- If a candidate answers a question TWICE, only mark the FIRST attempt.
- Consistent Accuracy applies in all aspects of the marking memorandum.

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QUESTION 1			
1.1	$=3x^2+2x-1+2x^2+x+9$ $=3x^2+2x^2+2x+x-1+9$ $=5x^2+3x+8$	✓addition of terms ✓answer	(2)
1.2	$=-3x^2-7x+4-\left(5x^2+7x^2-2x\right)$ $=-8x^3-7x^2-5x+4$	✓difference ✓answer	(2)
1.3.1	$=-8x^6$	✓answer	(1)
1.3.2	$=\frac{9x^2y}{xy}+\frac{xy}{xy}$ $=9x+1$	✓$\frac{9x^2y}{xy}+\frac{xy}{xy}$ ✓$9x$ ✓1	(3)
1.3.3	$=\sqrt{16x^{16}}$ $=4x^8$	✓ $\sqrt{16x^{16}}$ ✓answer	(2)
1.3.4	$=5m^2-25+m^2+25$ $=6m^2$	✓ $5m^2-25$ ✓answer	(2)
1.4	$=\frac{10(5)-5(5)^2}{5(5)}$ $=\frac{50-125}{25}$ $=-3$	✓substitution ✓simplification ✓answer	(3)
			[15]
QUESTION 2			
2.1	$7x-6x=4+8$ $x=12$	✓additive inverses ✓answer	(2)
2.2	$2x+2=10$ $2x=8$ $x=4$	✓ $2x+2$ ✓simplification ✓answer	(3)
2.3	$5^{x+1}=5^3$ $x+1=3$ $x=2$	✓prime base ✓equating exponents ✓answer	(3)
2.4	Lerato's age = x Sam's age = $2x$ $\therefore 2x+x=48$ $3x=48$ $x=16$ ∴ Sam is 32 years old	✓x and $2x$ ✓equation ✓$x=16$ ✓answer	(4)
			[12]

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QUESTION 3				
3.1	$x + 29° + 90° = 180°$ $x = 61°$	(∠s on a str. line)	✓statement ✓reason	(2)
3.2	$x + 20° = 100°$ $x = 80°$	(vert opp ∠s =)	✓statement ✓reason	(2)
3.3	$x = 74°$ $y = 74°$ $x + z = 180°$ $74° + z = 180°$ $z = 106°$	(alt ∠s; AB || CD) (vert opp ∠s =) (co-int ∠s; AB || CD)	✓statement ✓reason ✓statement ✓reason ✓statement ✓reason	(6)
				[10]
QUESTION 4				
4.1	Δ PQT III Δ RST		✓answer	(1)
4.2	SSS SAS ASA RHS		✓✓Any two conditions	(2)
4.3.1	$\hat{M} = 38°$	(∠s opp = sides)	✓statement ✓reason	(2)
4.3.2	$\hat{K} + 38° + 38° = 180°$ $\hat{K} = 104°$	(sum of ∠s in Δ)	✓statement ✓reason	(2)
4.4.1	$\hat{F} = 156°$	(opp ∠s of rhombus)	✓statement ✓reason	(2)
4.4.2	$\hat{E} + \hat{D} = 180°$ $\hat{E} + 156° = 180°$ $\hat{E} = 24°$	(co-int ∠s; EF || GD)	✓statement ✓reason	(2)
4.4.3	DE = DG = 18 cm	(sides of a rhombus)	✓statement ✓reason	(2)
				[13]
			GRAND TOTAL	**[50]**