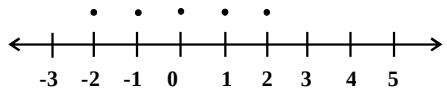
Mathematics Grade 9 June Paper (0001) Memo

Time: 2H **Total : 100 marks**

Section A (Algebra): [75]

Question 1: [8]

1.1 Complete the following table: **(6)**

	Set builder notation:	**Interval notation:**	**Graphic representation:**
(a)	$\{m \mid m \geq -10 ; m \in \mathbb{R}\}$		
(b)			
(c)		$y \in [0 ; 30]$	

1.2 Given: $-3,\dot{7}$; 125 ; $\sqrt[3]{-1}$; $\frac{14}{2}$; 4,125 ; $\sqrt{125}$ and π

(a) Write down the integer(s). **(1)**

(b) Write down the irrational number(s). **(1)**

Question 2: [13]

2.1 Simplify, without using a calculator.
Write the answers as positive exponents.

(a) $\sqrt{\frac{75mn^{19}}{12m^5n^3}}$ **(3)**

(b) $(2xy^0k^{-2})^2$ **(3)**

2.2 Simplify, without using a calculator and write the answer in scientific notation. **(3)**

$(1,5 \times 10^3) \div (5 \times 10^5)$

2.3 Solve for *x*:

(a) $2x^{\frac{2}{3}} = 32$ **(2)**

(b) $8^x = 0,5^{x+1}$ **(2)**

Question 3: [10]

3.1 Complete the following table and answer the questions below: **(2)**

Position in sequence:	1	3	4	5	8
Term:	3	-5	-9		

(a) Determine the general term and write it as T_n = ……. **(2)**

(b) Determine the 20^{th} term. **(2)**

(c) Which term will be equal to -301? **(2)**

3.2 Complete the next three terms in the sequence and write the pattern in words:

-128 ; 64 ; -32 ; 16 ; …….. **(2)**

Question 4: [21]

4.1 Consider the following algebraic expression:

$$3xy + 4x^2(2 - 3x) - 7 + 6x^{11}y^3 - (x^3 - 2)$$

(a) How many terms are there in the expression? **(1)**

(b) Simplify the expression. **(3)**

(c) Arrange the expression in (b) in ascending powers of *x*. **(1)**

(d) Write down the constant term in (b). **(1)**

4.2 If $m = \frac{3}{4}$; $n = -0{,}5$ and $t = 0$, calculate the numerical value of the following without using a calculator.
Show all calculations.

(a) $(6m - 3n)^2$ **(3)**

(b) $\frac{n}{m} + 5t - m^t$ **(3)**

4.3 Simplify:

(a) $(3k - p)(2k + p)$ **(2)**

(b) $2(x + 5)^2$ **(3)**

(c) $2pq^3(p^2q - 2) - (p^3q^4 + 3pq)$ **(4)**

Question 5: [18]

5.1 Solve for x:

(a) $4x - 3 = 6x - 2$ **(1)**

(b) $3(x + 1) - (x - 2)^2 = 2 - x^2$ **(4)**

(c) $(3x - 2)(4 - 3x) = 0$ **(2)**

(d) $\frac{x-4}{2} + \frac{1}{x} = \frac{x}{2}$ **(4)**

5.2 Calculate x and y if $2x + 3 = x$ and $4y - x = 7$ **(3)**

5.3 Karen is a long jump athlete. Her friend Sandra, has a personal best for the season that is 0,3 m less than the personal best for Karen for the season. The personal best for the season for Carel, Karen's brother, is double Sandra's personal best for the season. The total (each athlete's personal best) for the three athletes is 15,5 meters. Calculate Karen's personal best for the season. **(4)**

Section B (Geometry): [30]

Question 6: [4]

6.1 Use a sharp pencil, compass, protractor and a ruler and construct Δ ABC with $\hat{A} = 50°$, AB = 8 cm and AC = 65 mm. **(2)**

6.2 Use the construction in 6.1 and construct CP if CP $\perp$ AB. **(2)**

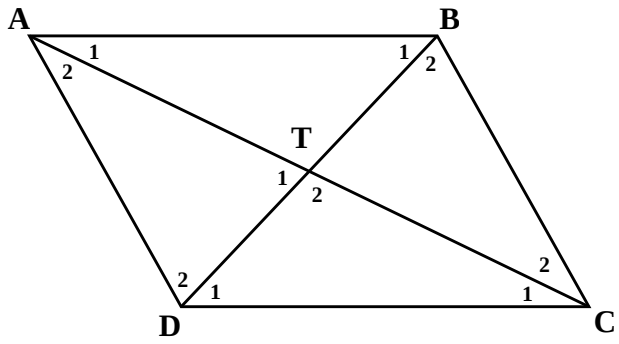
Question 7: [11]

7.1 Complete the following:

(a) A rhombus is a parallelogram of which……. (1)

(b) The diagonals of a parallelogram……. (1)

7.2 ABCD is a parallelogram with $\hat{D} = 100°$.
$\hat{A}_1 = 2x$ and $\hat{A}_2 = 3x$

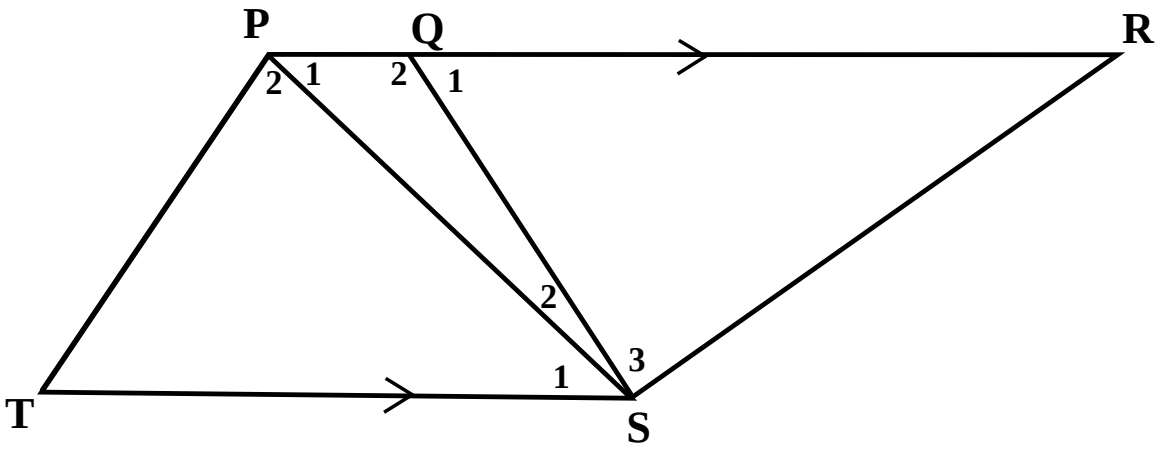


(a) Calculate, with reasons, for *x*. (2)

(b) If $\hat{B}_1 = 2x + 18°$, prove that ABCD is a rhombus. (3)

(c) AD = 100 mm and BD = 120 mm. Calculate the length of AT. (4)

Question 8: [7]

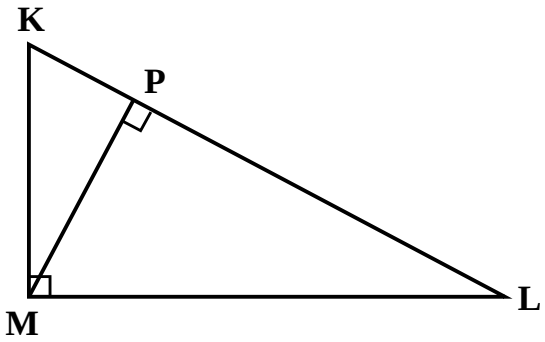


PR // TS with TS = PS = RS = QR and $\hat{S}_1 = 44°$

8.1 Calculate $\hat{R}$ (3)

8.2 Prove that Δ QRS $\equiv \Delta$ PST (4)

Question 9: [8]



9.1 Prove that: Δ KML /// Δ MPL **(4)**

9.2 Calculate the length of ML if KL = 9 cm and PL = 4 cm. **(4)**