MOMALICHE 4 CYCLE 8
MATHEMATICS 121/1
MARKING SCHEME

1.	Numerator $9 \div - 3 + x$ $-3 - = -$ Denominator $+ x$ $= 5$ $= \div$ $= x$ $=$	M1 ✓ Numerator M1 For denominator A1	4	$= 2x - 1$ $y = - x + c$ $5 = 1 - 1 + c$ $c = 5$ $y = - x + 5$	M1 Partial integration with c M1 ✓ Attempt to substitute equation A1
		03 Marks			3 Marks
2.	$3y = -2x + 9$ $y = -2/3\, x + 3$ $g=$ $-2a + 26 = 21 - 3a$ $a = -5$	B1 M1 ✓ Equation formed A1	5	$x = \frac{2x}{}$ $x =$ $x =$ $9x = 6$ $x =$	M1 Equation expressed in based 3 M1 Expressing powers A1
		3 marks			3 Marks
3.	$7x - 4 \leq 9x + 2$ ..(i) $9x + 2 < 3x + 14$ (ii) Solving (i) $7x - 4 \leq 9x + 2$ $-2x \leq 6$ $x \geq -3$ Solving equation (ii) $9x + 2 < 3x + 14$ $6x < 12$ $x < 2$ Combining (i) and (ii) $-3 \leq x < 2$ $-3 \ -2 \ -1 \ 0 \ 1 \ 2$ Integral values are $-3, -2, -1, 0, 1$	✓Solving equation (ii) ✓Solving equation (ii) ✓B1 Solution represented on number line ✓A1 Integral values	6.	$6480 = 2^4 \times 3^4 \times 5$ $\qquad 7200 = 2^5 \times 3^2 \times 5^2$ $\qquad GCD = 2^4 \times 3^2$ $\qquad LCM = 2^5 \times 3^5 \times 5^2 \times 7^3$ $\qquad x$ $\qquad$ Third number: $2^4 \times 3^3 \times$ $7^3 \qquad = 148,176$	M1 M1 A1
		4 marks	7.	Cost of the car in USD $= 5000 + x\ 5000$ $= 5000 + 1000$ $= USD\ 6000$ If $1USD = 105$ yen $\qquad ? \quad = 80,325$ $= 765$ USD Total cost in US\$ $= 6765$ Amount needed in KSh. KSh. 63×6765 KSh. $426,195$	M1 ✓ Cost obtained M1 A1
					3 marks
8	$5\,x\ - 14\,x$ $5 \times 0.126\,x\ - 14\,x$ 0.1721×10 $= 60.3 - 24.094$ $= 36.206$	M1 M1 A1	14.	A.S.F $= =$ L.S.F $= =$ V.S.F $= =\ ^3$ V.S.F $= =$ $V = x\ 400 = 6250cm^3$ Volume in litres $=$ $= 6.25L$	M1 L.S.F M1

					A1
		4 Marks			3 Marks
9.	$= =$ $3a = 12 - a$ $4a = 12$ A = 3cm $\therefore$ TB = 3cm	M1 M1 A1	15	$\angle SPQ = 90^0$ $\angle TSP = 90^0 - 56^0 = 34^0$ $\angle PSQ = 90^0 - 28^0 = 62^0$ $\angle PRQ = \angle PSQ$ (Subtd by same chord) $\angle PRQ = 62^0$	B1 B1
		3marks			2Marks
10.		B1 correct image B1 ✓correct labelling	16.	$\dfrac{(x-3)^2 - (3x-9)}{(x+3 \, (x-3)}$ $\dfrac{x^2 - 6x + 9 - 3x + 9}{(x+3)(x-3)}$ $\dfrac{x^2 - 9x + 18}{(x+3)(x-3)}$ $\dfrac{(x-3)(x-6)}{(x+3)(x-3)}$ $\dfrac{x-6}{x+3}$	M1 M1 A1 A1
		3 Marks			
11.	$= 1.2 \times k$ $k = = 5$ Length in cm Frequency $7.5 \le x \le 9.5$ 12 $9.5 \le x \le 11.5$ $5 \times 1.6 = 16$ $11.5 \le x \le 15.5$ $5 \times 0.8 \times 4 = 16$ $15.5 \le x \le 21.5$ $5 \times 2 \times 6 = 60$	B1 ✓Constant B1 B1			
		3 Marks			10 Marks

12.	Let x = y
	$- 3y - 4 = 0$
	
	$(y-4)(y+1) = 0$
	y = 4 or y = -1
	
	x = 4 and x = 1
	x = 16 or x =
		M1 ✓Quadratic equation
		M1
		✓Factorization
		A1 For both values of y
		
		B1 for both values of x
			17.	(a) $250 \times 14 \times 2 \times 2 = 14000$
				    Net profit = 14000 – 6000
				    = KSh. 8000
				(b) $8000 \times 25 = 200,000$
				    = 190,000
				(c) Saving: x 190,000
				    = 76000
				Remaining profit = x 190,000
				    = 68,400
				Muthoka's share
				    + x 68,400
				
				    = 30,400
				(d) $\dfrac{475,000 \times 3 \times 100}{95}$
				= 1,500,000
					M1 ✓Profit
					
					A1
					
					B1 ✓Profit
					M1 ✓Equation for equal share
					
					A1
					
					M1 ✓Expression of M uthoka's share
					
					A1
					M1
					M1
					A1

		4 Marks			
13.	$8t + 6s = 4160$ $4t + 12s = 4000$ $4t + 3s = 2080$ $\underline{t + 3s = 1000}$ ⁻ $3t = 1080$ $\underline{t = 360}$ s = 213 Trouser = Sh. 360 Shirt = Sh. 213.33	M1 ✓ Simultaneous equations formed M1 ✓Attempt to eliminate A1 For both			
		3 Marks			10 Marks
18.	i) (4000 x 12) +(1100 x 12) = Sh. 61,200	M1	19.	(a)	

(a)

x	-8	-7	-6	-5	-4	-3	-2	-1	0	1	2	3	4
$2x^2$	128	98	72	50	32	18	8	2	0	2	8	18	32

5x	-4	-35	-30	-25	-20	-15	-10	-5	0	5	10	15	20
	-12	-12	-12	-12	-12	-12	-12	-12	-12	-12	-12	-12	-12
y	76	51	30	13	0	-9	-14	-15	-12	-5	6	21	40

(ii) 1st slab 4200 x2= 8400
     2nd slab 3800 x 3 = 11400
     3rd slab 4600 x 5 = 23000
 42800
     4th slab x 6 = (61,200 – 42800)
     = K£ 3066.70
     = Taxable income
       (12600 + 3066.70
     = K£ 15666.7
 (iii) - 10800
 = KSh. 15,311.20
 (iv) 26111.20 – 4000
 Sh. 22,311.20
	A1 or 5100 x 2
	 M1
	 1st to 3rd slab
	
	 4th slab
	
	 M1
	
	 M1
	
	 A1
	 M1
	 A2
	 M1
		B1 – For half + correct values B1B1 for all values.
		 (b) (i) $2x^2 + 5x – 12 = y$
		       $2x^2 + 5x – 12 = 0$
		             $0 = y$
		 x = -4 or 1.5
		 (b)(ii) $= 2x^2 + 5x- 12$ x -3
		 $0 = -3x^2 – 7x + 3$ x 2
		 $-3y = -6x^2 – 15x + 36$
		 $0 = -6x^2 – 14x + 6$
		 $-3y = \quad -x \quad - 30$
		 y = x + 10
		 x = -4.7 or 2.3
			Graph
			
			 B1B1
			 B1
			 B1

	3 Marks		

20	(a) x 30h+ x40h+60h = 2090
	 95h = 2090
	 h = 22m/s
	 max speed =
	 = 79.2 km/h
	 (b) a =
	 =
	 (c) x 20 x 11 =
	 = 110m
	 (d) Time for half journey
	  x 22 (30 + t + t) = x 2090
	 11 (30 + 2t) = 1045
	 330 + 22t = 1045
	 22t = 919
	 t = 32.5
		M1
		
		 A1
		
		 B1
		
		 M1
		 A1 v 0.7333 m/s accept km/h
		 M1
		 A1
		
		 M1
		 M1
		
		 A1
		 FTQ
			21	(a) 40⁰ – Angle subtended by the same
				    arc: MN
				 (b) 25⁰ – Diameter of a circle subtends
				    90⁰ at the circumference of a circle.
				 (c) 65⁰ – Alternate segment theorem
				    (∠LNP is alternate to ∠LKN)
				 (d) 10⁰ – Sum of angles in a triangle
				    add up to 180
				 (e) 50⁰ – Alternate segment theorem or
				    sum of angles in a straight line add
				    up to 180⁰.
					B1 ✓Angle
					 B1 ✓Reason
					
					 B1 ✓Angle
					 B1 ✓Reason
					
					 B1 ✓Angle
					 B1 ✓Reason
					 B1 ✓Angle
					 B1 ✓Reason

22			23.		

	(a) 2 = 2 x x 35 x 35 = 7700cm²
	 (b)
	
	 (c) =
	 120 + 2x = 5x
	 x = 40cm
	 Slant height= 60 + 40 =100cm
	 (c) -
	  x 35 x 100 - x 14 x 40
	    11000 – 1760 = 9240cm²
	 Base area ()
	 = x 14 x 14 = 616cm²
	 Total surface area
	 7700 + 616 + 9240 = 17,556cm²
	
	      = (Q – P)
		B1 ✓Area
		
		 M1 ✓Expression
		 M1✓ Equation
		
		 M1A1✓Equation for slant height
		 ✓Accuracy
		
		 M1 Expression
		 M1
		
		 M1
		
		 M1A1
		 B1
		 M1
				10 Marks
				 24
					(a) Initial acceleration is at t = 0
					  = - 6 + 3t + 3
					 a = = -12t + 3
					 when t = 0, a =[0 + 3
					 ∴ a = 3m/s²
					 (b) (i) at rest V = 0
					 -6 + 3t + 3 = 0
					 (2t + 1) (t-1) = 0
					 t = - or t = 1 (t = - not applicable)
					 (ii) S = - + + 3t
					 When t =m 1, s = -2 + + 3 (1)
					 2.5M
					 (c) When velocity is maxium, a = 0
					 -12t + 3 = 0
					       t =
					 Max v = -6 + 3 + 3 = 3.375 m/s
						M1
						 M1
						
						 A1
						
						 M1
						 M1
						 A1 for t = 1
						
						 M1 Substitution
						
						 A1
						
						 M1For substitution
						 A1

= P – Q	A1			

(iii) PT = PS + ST
= -P + (-QS)= -p + (Q - P)   M1
=-p + q - p   A1
=-p + q = q - p

(iv) TR = TQ + QR   M1
= QR - Q
= -(p – q) - Q
= -p + q - q = - P + Q   A1
= Q - P
PT = Q - P
TR = Q - P
   PT = 3TR or PT = RT
Common point T
PT is a multiple of TR
PT = 3TR
Hence PTR are collinear

M1 (both seen)

M1 (both seen)

A1 conclusion

| | 10 Marks | | | |

NO. 19

−y = 2x² + 5x − 1 2

y = 1/3x + 10

S₁ ✓ Scale
P₁ ✓ Plotting
C₁ Smooth Curve
L₁ ✓ line drawn.