

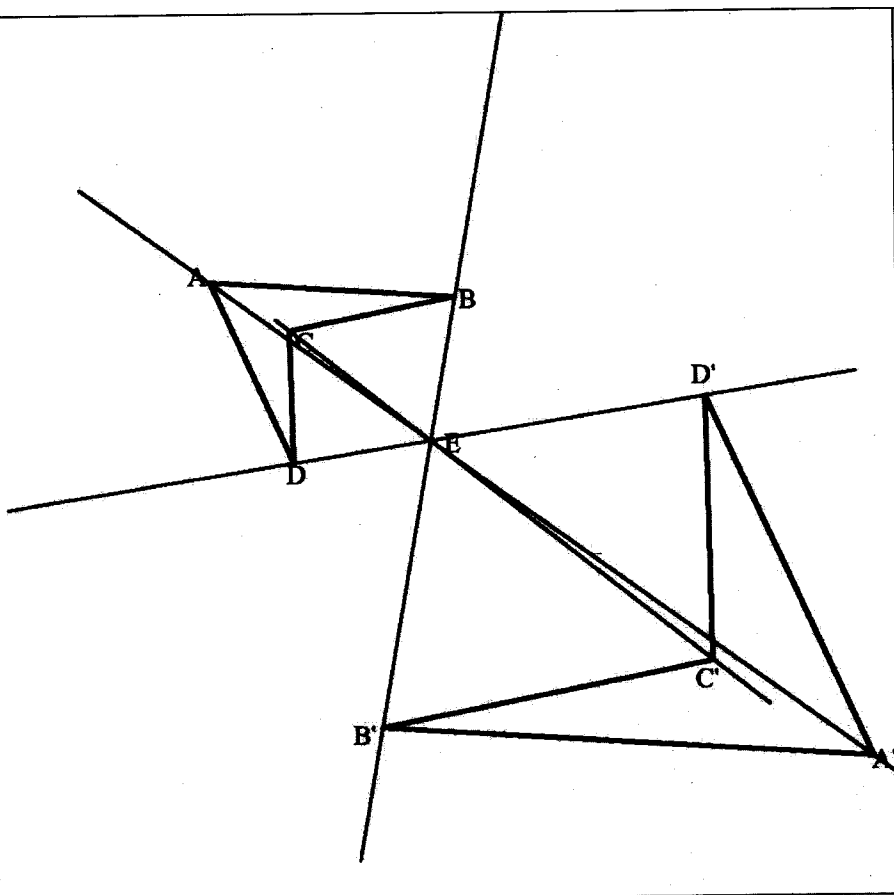
5.2 MATHEMATICS ALTERNATIVE B (122)

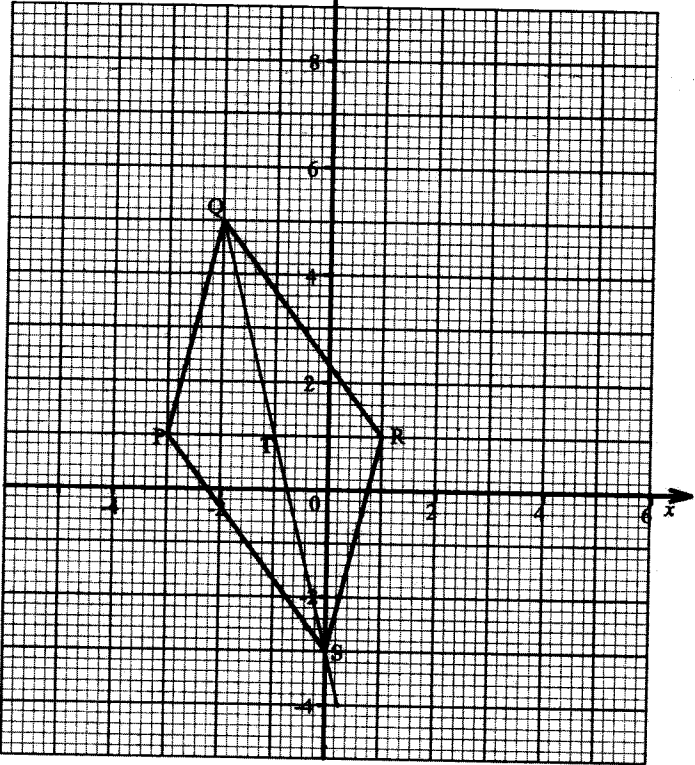
5.2.1 Mathematics Alternative B (122/1)

No	Marking scheme	Marks	Comments
1	$6q^2 - 11q - 6r - (4q^2 - 12q + 9)$ $6q^2 - 11q - 6r - 4q^2 + 12q - 9$ $2q^2 + q - 6r - 9$	M1 A1 2	Expansion of quadratic part
2	$\frac{x}{10} + \frac{x}{12} = 1\frac{5}{6}$ $\frac{22}{120}x = \frac{11}{6}$ $x = \frac{11}{6} \times \frac{120}{22}$ $x = 10\text{km}$	M1 M1 A1 3	
3	$\cos(90 - \alpha) = \frac{24}{25}$ opposite side = 7 $\therefore \cos \alpha = \frac{7}{25}$	B1 B1 2	
4	$= \left(27 \frac{y^9}{y^{12}} \right)^{\frac{1}{3}}$ $= (3^3 y^{-3})^{\frac{1}{3}}$ $= 3y^{-1}$	M1 M1 A1 3	Accept $\frac{3}{y}$
5	$\sqrt[3]{240.3 + 0.6042}$ $= 6.2167 + 0.6042$ $= 6.821$	M1 M1 A1 3	

No	Marking scheme	Marks	Comments
6	$y = -6x - c$ $-2 = -6(4) - c$ $-2 = -24 - c$ $c = -22$ $m_1 = -6$ $m_1 \times m_2 = -1$ $-6 \times m_2 = -1$ $m_2 = \frac{1}{6}$ $py + 4x - 10 = 0$ $py = -4x + 10$ $y = \frac{-4}{p}x + \frac{10}{p}$ $\frac{-4}{p} = \frac{1}{6}$ $p = -24$	M1	
		A1	
7	$3(x+1) < 5x-11$ $3x+3 < 5x-11$ $-2x < -14$ $x > 7$ $5x-11 < x+45$ $4x < 56$ $x < 14$ $7 < x < 14$ Integral values are 8,9,10,11,12,13	B1	
		4	
		M1	
		M1	
		A1	
		B1	
		4	

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8		B1 B1	Any two image points correctly located Correct image
9		M1 M1 A1	Removing bracket
10	$\text{Area} = \frac{30}{360} \times \frac{22}{7} \times 5 \times 5 - \frac{1}{2} \times 5 \times 5 \sin 30^\circ$ $= 6.5476 - 6.25 \text{cm}^2$ $= 0.2976 \text{cm}^2$	M1 M1 M1 A1	Area of sector Area of triangle
		3 4	

11	$10r = 0.3333\dots$ $10r = 3.333333$ $9r = 3$ $r = \frac{1}{3}$ $\frac{1}{3} \times 39$ $= 13$	M1 M1 A1 3	
12	$54 = 2 \times 3^3$ $72 = 2^3 \times 3^2$ $60 = 2^2 \times 3 \times 5$ shortest distance $= 2^3 \times 3^3 \times 5$ $= 1080 \text{ cm}$	M1 A1 2	
13	 <p>$P(-3, 1)$ $S(0, -3)$</p>	B1 B1 B1 B1 4	Plotting Q, T, R Completing the parallelogram

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14	<p>The sides are:</p> $\frac{3}{14} \times 56\text{cm}, \frac{5}{14} \times 56\text{cm}, \frac{6}{14} \times 56\text{cm}$ $= 12\text{cm}, 20\text{cm}, 24\text{cm}$ $s = \frac{1}{2} \times (12 + 20 + 24) = \frac{56}{2} = 28$ $\text{Area} = \sqrt{28(28-12)(28-20)(28-24)}$ $= \sqrt{28 \times 16 \times 8 \times 4}$ $= 119.7 \text{ cm}^2$	<p>M1</p> <p>M1</p> <p>M1</p> <p>A1</p> <p>4</p>	
15	<p>(a) Marked price</p> $= \frac{550 \times 100}{80}$ $= \text{Ksh } 687.50$ <p>(b) Buying price</p> $= \frac{110}{100} \times 550$ $= \text{Ksh } 605$	<p>M1</p> <p>A1</p> <p>M1</p> <p>A1</p> <p>4</p>	
16	$AC = \sqrt{300^2 + 400^2}$ $= \sqrt{900 + 1600}$ $= \sqrt{2500}$ $= 500\text{km}$	<p>M1</p> <p>M1</p> <p>A1</p> <p>3</p>	

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(a) (i)

$$\frac{y-5}{x+3} = 1$$

$$y-5 = 1(x+3)$$

$$y = x + 8$$

(ii) when $y = 4$

$$4 = x + 8$$

$$x = -4$$

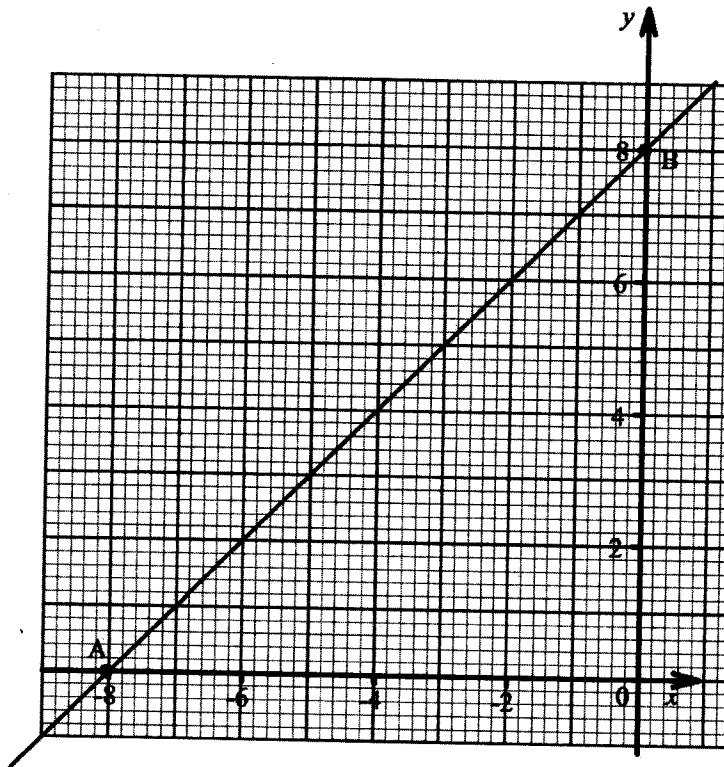
(b) (i) coordinates of x - intercept of line L

$$0 = x + 8 \Rightarrow x = -8$$

Coordinate of x - intercept = $(-8, 0)$

(ii) Coordinates of y - intercept of line L

$$y = 0 + 8 = 8$$

Coordinates of y - intercept = $(0, 8)$ 

M1

A1

M1

A1

M1

A1

M1

A1

P1

L1

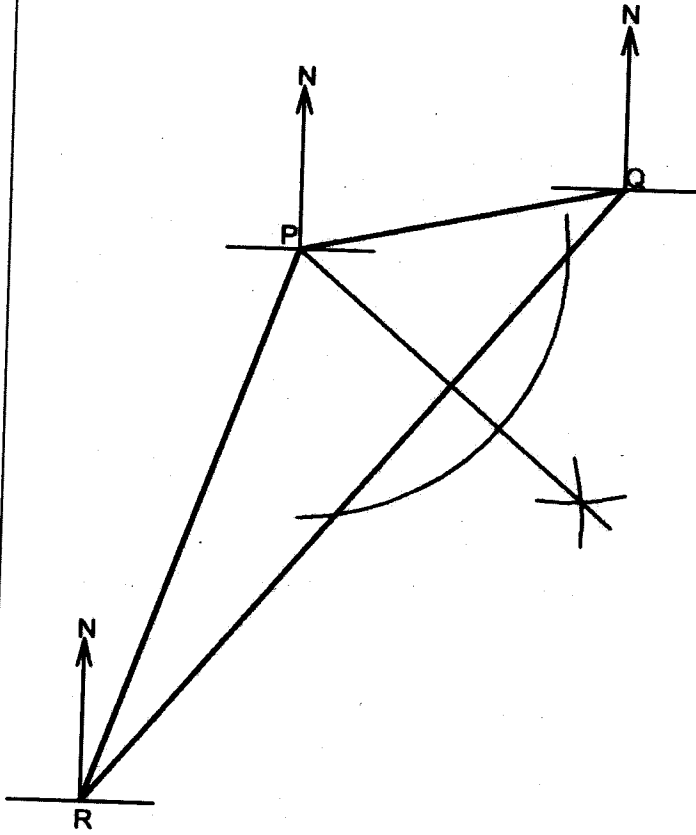
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18. (a)	$\frac{2}{100} \times \text{Ksh } 120\,000 = \text{Ksh } 2\,400$ $\frac{3}{100} \times \text{Ksh } 130\,000 = \text{Ksh } 3\,900$ $\frac{5}{100} \times \text{Ksh } 40\,000 = \text{Ksh } 2\,000$ <p>Total = 2 400 + 3 900 + 2 000</p> <p>= Ksh 8 300</p>	M1	M1	A1
(b)	$\frac{2}{100} \times 120\,000 = 2\,400$ $\frac{3}{100} \times 130\,000 = 3\,900$ <p>5% commission = 11 300 – 6 300 = 5 000</p> $\frac{5}{100} \times x = 5\,000$ $x = 5\,000 \times \frac{100}{5}$ <p>= Ksh 100 000</p> <p>Total Sales = 120 000 + 130 000 + 100 000</p> <p>= Ksh 350 000</p>	M1	M1	M1
(c)	<p>Commission = 20 800 – 13 000</p> <p>= Ksh 7 800</p> <p>5% commission = 7 800 – 6 300 = 1 500</p> $\frac{5}{100} x = 1\,500$ <p>x = 30 000</p> <p>Total sales = 120 000 + 130 000 + 30 000</p> <p>= Ksh 280 000</p>	M1	M1	A1
				10

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19. (a) Scale 1: 100000
1cm rep. 1km



- (b) (i) Bearing of Q from R = $40^\circ \pm 1^\circ$
(ii) Distance RQ = $12.4\text{cm} \pm 0.1$
= 12.4 km
(iii) Constructing perpendicular from P to RQ
Shortest distance = $3\text{cm} \pm 0.1\text{cm}$
= 3km

B1 Correct scale used

B1 Location of Q

B1 Location of R

B1 Complete figure

B1

B1

B1

B1

B1

B1

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20. (a) (i)	Surface area of hemispherical part = πr^2 $= 2 \times 3.142 \times 1.5^2$ $= 14.139 \text{cm}^2$	M1	Downloaded From: https://atikaschool.org	
	Surface area of the cylindrical part = $2\pi rh$ $= 2 \times 3.142 \times 1.5 \times 6.5$ $= 61.269 \text{cm}^2$	M1		
Surface area in contact with liquid $= 61.269 + 14.139$ $= 75.408 \text{cm}^2$	A1			
(ii)	Vol = $\frac{2}{3} \times 3.142 \times 1.5^3 + 3.142 \times 1.5^2 \times 6.5$ $= 7.0695 + 45.952$ $= 53.022 \text{cm}^3$	M1M1 M1 A1		
	(b)	Volume of spherical marble = $\frac{4}{3} \times 3.142 \times 1^3$ $= 4.189$		M1
		New height of new cylinder $3.142 \times 1.5^2 \times h = 4.189$ $h = \frac{4.189}{3.142 \times 1.5^2}$ $h = 0.593$		M1
New height = $8 + 0.593$ $= 8.6 \text{cm}$	A1			
		10		

21.

(a)

Let Agnes produce be x and Janet produce be y.

$$\frac{50}{300}x + \frac{20}{100}y = 15200$$

$$\frac{25}{200}x + \frac{25}{300}y = 9000$$

$$5x + 6y = 456000$$

$$3x + 2y = 216000$$

$$5x + 6y = 456000$$

$$9x + 6y = 648000$$

$$4x = 192000$$

$$x = 48000$$

$$5(48000) + 6y = 456000$$

$$6y = 216000$$

$$y = 36000$$

$$\text{Agnes produce} = \frac{48000}{1000} = 48 \text{ tonnes}$$

$$\text{Janet Produce} = \frac{36000}{1000} = 36 \text{ tonnes}$$

(b)

$$2x = y - 1$$

x	0	1
y	1	3

$$x - 2y = 4$$

x	0	4
y	-2	0

M1

Formation of simultaneous equation

M1

M1

Attempt to solve

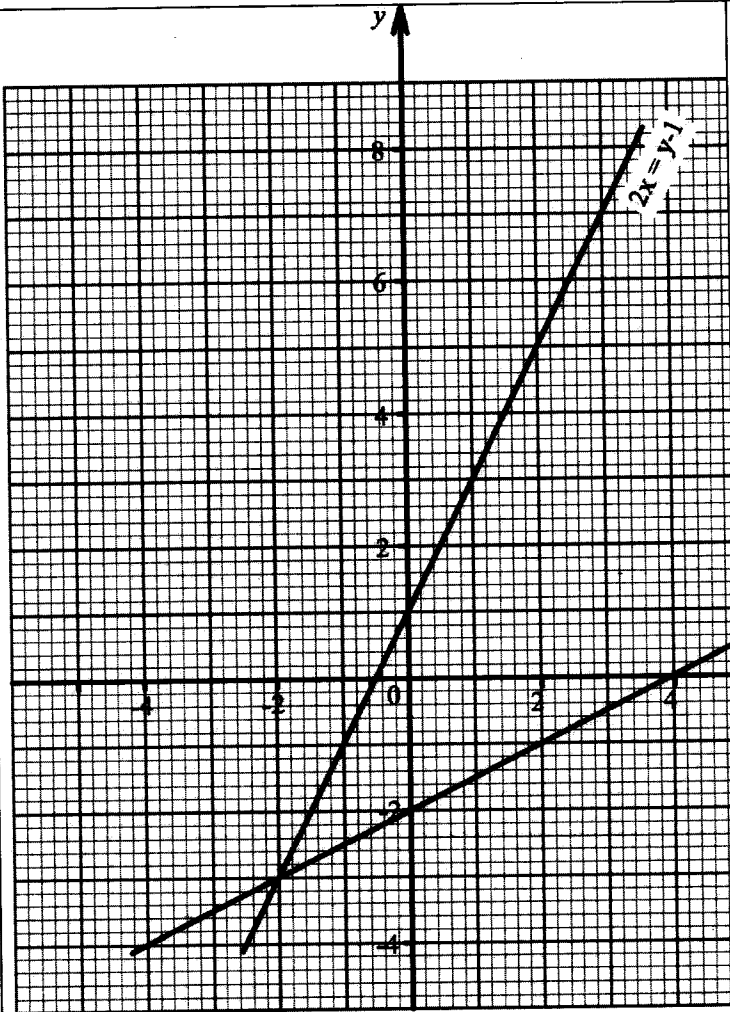
A1

B1

For both 48 and 36

B1

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$x = -2, y = -3$

L1

L1 correctly drawn

L1

L2 correctly drawn

B1

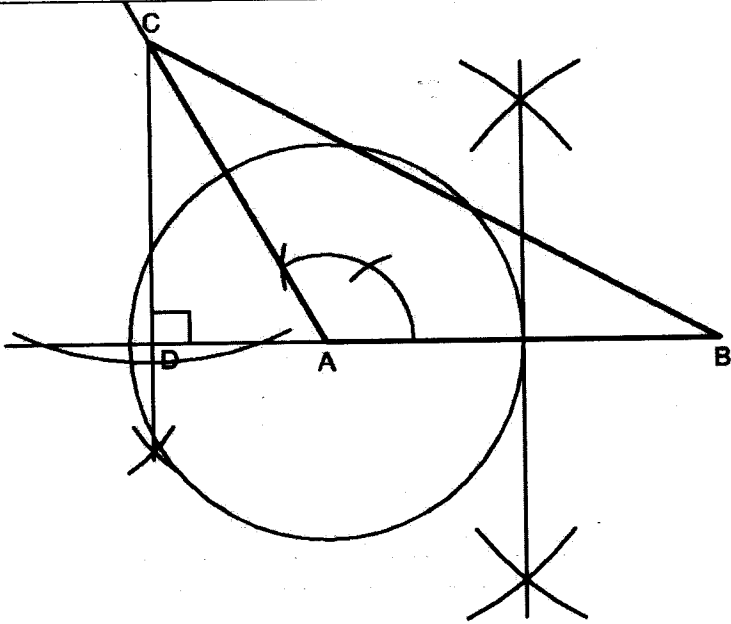
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22.			
(a)	$\angle TQU = \frac{180 - 54}{2} = 63^\circ$ <p>Base angles of an isosceles triangle are equal</p>	B1 B1	
(b)	$\angle TSQ = 180^\circ - 63^\circ = 117^\circ$ <p>Opposite angle of a cyclic quadrilateral add up to 180°</p>	B1 B1	
(c)	$\angle TQS = 180^\circ - (117^\circ + 28^\circ) = 35^\circ$ <p>Angles in a triangle TSQ add up to 180°</p>	B1 B1	
(d)	<p>Re flex $\angle UOQ = 360^\circ - 108^\circ = 252^\circ$</p> <p>Angles at a point add up to 360°</p>	B1 B1	
(e)	$\angle UQR = 180^\circ - (35^\circ + 63^\circ) = 82^\circ$ <p>Angles on a straight line add up to 180°</p>	B1 B1	
		10	

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23. (a)
(i)



B1 Locating points B and C correctly

B1 Construction of angle 120

B1 Complete diagram

(ii)

Length BC = 9.9cm ± 0.1

B1

(b)

Perpendicular drawn

B1

Radius = 3cm ± 0.1

B1

Circle drawn

$$\frac{22}{7} \times 3 \times 3 = 28.29\text{cm}^2$$

M1

A1

Perpendicular CD

B1

(c)

CD = 4.5cm ± 0.1

B1

10

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24			
(a) (i)	$\frac{110}{100} \times 3800000$ $= \text{Ksh. } 4\,180\,000$	M1	For 4
	$\frac{55}{100} \times 4180000$ $= \text{Ksh } 2\,299\,000$	M1 A1	
(ii)	$\text{Balance} = 4\,180\,000 - 2\,299\,000$ $= \text{Ksh } 1\,881\,000$	M1 A1	
(b)			
(i)	$\frac{3}{11} \times \text{Ksh } 1881000$ $= \text{Ksh } 513\,000$	M1 A1	
(ii)	$\frac{4}{11} \times 1881000$ $= \text{Ksh } 684\,000$	M1 M1 A1	
		10	

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