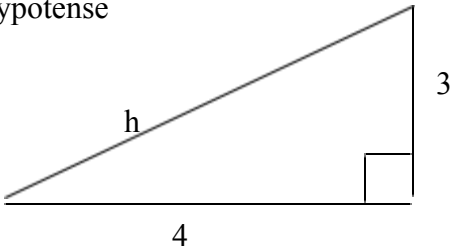


121/2
MATHS
PAPER 2

MARKING SCHEME .

1.	$(x-y)(x+y)$ $(3282 - 3272)(3282 + 3272)$ 65540	M1 M1 A1	
		3	
2.	Tan x = is positive 3rd quadrant Then $\sin x = -\frac{3}{5}$ Hypotense  $h = \sqrt{4^2 + 3^2} = \sqrt{25} = 5$ $\sin x = -\frac{3}{5}$ $\cos x - \sin x = \frac{4}{5} - \frac{3}{5} = \frac{1}{5}$ $= -\frac{1}{5}$	B1 M1 A1	Identification the hypotenuse Cao accept (-0.2)
		3	
3.	$1^6 + 6(-\frac{1}{2}x) + 15(-\frac{1}{2}x)^2 + 20(-\frac{1}{2}x)^3$ $= 1 - 3x + \frac{15x^2}{4} - 5x^3$ $X = -0.04$ $1 - 3(-0.04) + \frac{15}{4}(-0.04)^2 - 5(-0.04)^3$	M1 M1	For ✓ simplification

		4	
7.	$1000 \left(1 + \frac{6}{100}\right)^3$ 1000×1.06^3 $Ksh\ 11910.16$ 11910	M1 A1	
		2	
8	$4.562 \times 0.38 = 1.73356$ $\sqrt[4]{1.73356} = 1.14745 \div 0.82$ $= 1.3993$ $= 1.4$	M1 M1 A1	
		3	
9.	$\frac{18 \times 64 \times 5}{24 \times 80}$ $\frac{6 \times 64}{8 \times 16}$ 3 days	M1 M1 A1	For✓ simplification
		3	
10.	$\text{True value} = \sqrt{1 + n} = 1.44 = 1.2$ Approx. value $1 + \frac{n}{2} = 1 + \frac{44}{2} = 1.22$ $= 1.22 - 1.2$ $= 0.02$ $\frac{1.02}{1.2} \times 100 =$ 1.2 $= 1.67 \%$	 M1 M1 A1	
		3	
11.	$\begin{pmatrix} 3 & 0 \\ 0 & 4 \end{pmatrix} \begin{pmatrix} a & b \\ 0 & c \end{pmatrix} = \begin{pmatrix} 3+a & b \\ 0 & 4+c \end{pmatrix}$ $3a + 0 = 3 + a$ $3b + 0 = b$ $3a = 3 + a \longrightarrow a = \frac{3}{2}$ $3b + 0 = b$ $2b = 0$	M1 M1	For matrix equation For✓ forming of simultaneous equation

	$B = 0$ $0 + 4c = 4 + c$ $3c = 4$ $C = \frac{4}{3}$	A1	For values of a, b and c (correct)
12.	$\frac{2x^2 - 2x + x - 1}{(x + 1)(x - 1)}$ $\frac{2x(x - 1) + 1(x - 1)}{(x + 1)(x - 1)}$ $= \frac{(2x + 1)}{(x + 1)}$ $= \frac{2x + 1}{x + 1}$	M1 M1 A1	
		3	
13	$\frac{2}{3} \text{ cm} = 25000 \text{ cm}$ $\frac{3}{4} \text{ cm} = 250 \text{ m}$ $\frac{4}{5} \text{ cm} = 0.25$ $1 \text{ cm}^2 = 0.0625$ $20 \text{ cm}^2 = 20 \times 0.0625$ $= 1.25 / \text{cm}^2$	M1 M1 A1	
		3	
14.	$AB \cdot BC = DC^{-2}$ $5: BC = 36$ $BC = \frac{36}{5}$ $= 7.2 \text{ cm}$	M1 M1 A1	
		3	
15.	$\log_{10}^8 + \log_{10}^{750} - \log_{10}^6$ $\log_{10} \log_{10} \frac{(8 \times 750)}{6}$ $= \log_{10}^{1000}$ $= 3$	M1 M1 A1	
		3	
16.	$P(R) = \frac{1}{2} \times \frac{4}{12}$		

	$P(R) = \frac{1}{2} \times \frac{3}{18}$ $= \frac{1}{6} + \frac{3}{20}$ $= \frac{20+18}{120}$ $= \frac{38}{120} = \frac{19}{60}$	M1	
		M1	
		M1	
		A1	
		4	

17	Taxable income $\frac{115}{100} \times 8570 = 9855.50$ <u>9855.50x 12</u> p.a 20 5913.30 Tax 1 – 1500 → 150 } 1501 – 3000 → 225 } 3001 – 4500 → 375 } 4501 – 5913.30 → 494.30 } 1244.30 - <u>90.00</u> K £ 1154.30 pa . or Ksh 1923.83 per month Total Decuctions $\frac{2}{100} \times 9855.5$ 197.11 (wcps) + 20.00 246.00 + Tax per month <u>1923.83</u> 2386.94 Net salary	M1 A1 M1 M1 M1 A1 M1 A1	
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	9855.50 – 2386.94 Ksh 7468.65	M1 A1	
		10	
18.	i) $\frac{\theta}{360} (2\pi R \cos \theta)$ $= \frac{60}{360} \times 2 \times \frac{22}{7} \times 6370 \cos 60$ $= 1/3 \times 22 \times 910 \times 0.5$ $= 3336 \text{ (7)}$ ii) Time $\frac{(4 \times 60)}{60}$ hrs 4 hrs. Local time 1200 + 4 $= 1600\text{hrs}$ b) $\frac{\theta}{360} \times 2\pi R = 800$ $= \frac{\theta}{360} \times 2 \times \pi \times 6370 = 800$ $\theta = \frac{800 \times 360}{2 \times \pi \times 6370}$ $= 7.196^\circ$ $\angle (60 - 7.196) = 52.80^\circ$ $(52.8^\circ \text{ N } 45^\circ \text{E})$	M1 A1 B1 M1 M1 A1 B1	
19		10	
		10	

20.							B2	For all 6 values of y✓ B1 for at least 4 ✓	
	X	30	60	120	180	240			270
	Sin x	0.5	0.87	0.87	0	-0.87			-1.0
	2 cos x	1.73	1.0	-1.0	-2	-1.0			0
	Y	2.23	1.87	-0.13	-2	-1.87			-1.0
							S1		
							P1	Appropriate scale use ✓ plotting	

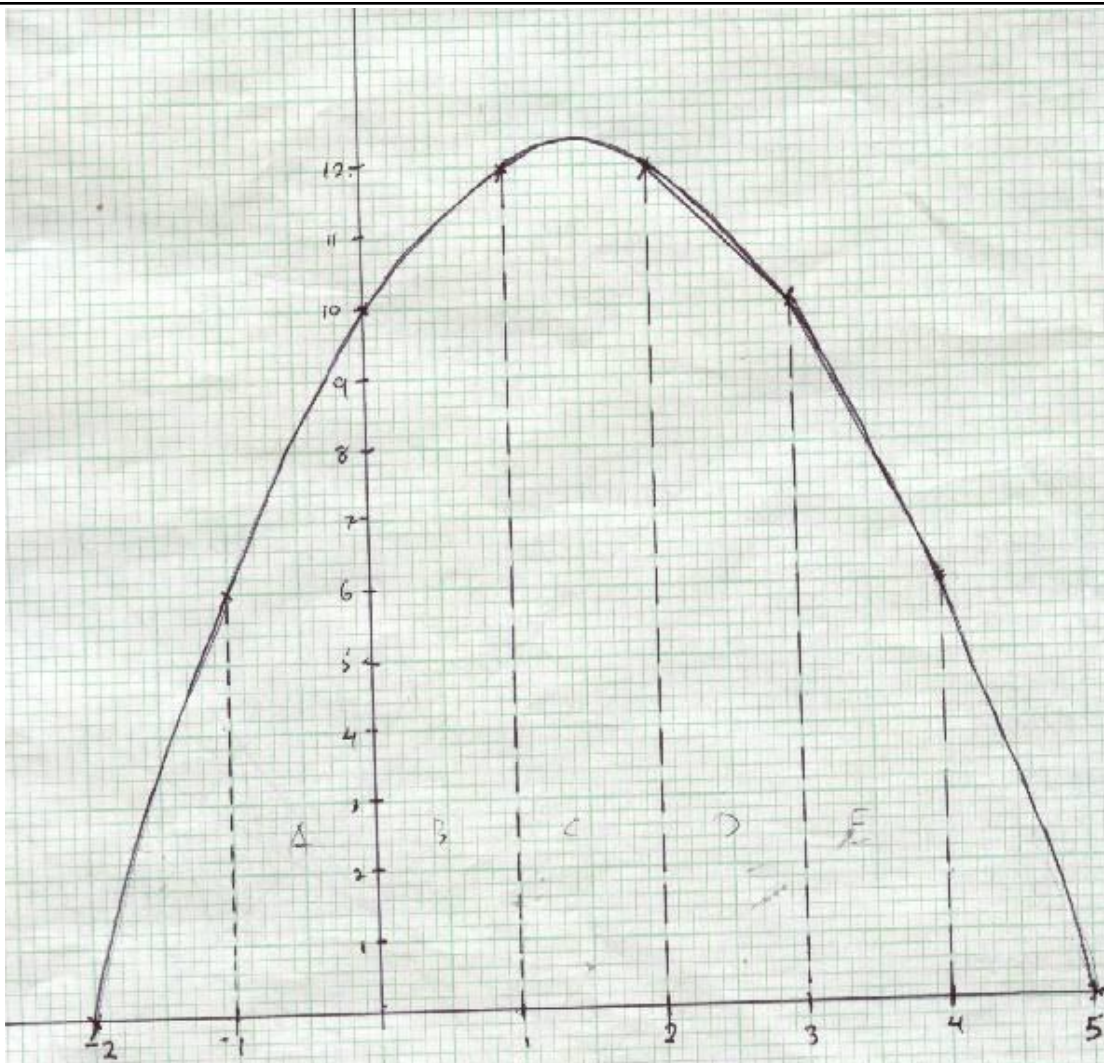
	c) $x = 114 \pm 3^\circ$ and $x = 294 \pm 3^\circ$ line thro $y = -1.5$ d)	C1 ✓ curve B2 Points identified and stated B1 only stated L1 B2 ✓ line Points identified and stated B1 only stated
		10

21		B2	✓ ✓ prob, tree
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a) $P(RR) = \frac{3}{12} \times \frac{2}{11}$ $\frac{1}{22}$ b) $P(IR) = RW \text{ or } RB \text{ or } WR \text{ or } BR$ $\frac{15}{132} + \frac{12}{132} + \frac{15}{132} + \frac{12}{132}$ $\frac{9}{22}$ c) $p(\text{At least white Ball}) =$ $P(RW) + P(WR) + P(WW) + P(WB) + P(B)$ $\frac{15}{132} + \frac{9}{132} + \frac{20}{132} + \frac{20}{132} + \frac{20}{132}$ $= \frac{84}{132} \text{ or } \frac{7}{11}$	M1 A1 M1 A1 M1 A1	Or equivalent 0.04545 Or equivalent 0.4091 Or equivalent 0.6364 Or equivalent 0.2424
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	d) $P(\text{RR or WW or BB})$ $= \frac{6}{132} + \frac{20}{132} + \frac{12}{132}$ $= \frac{19}{66}$	M1 A1	
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22	<table><tr><td>X</td><td>-2</td><td>-1</td><td>0</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td></tr><tr><td>Y</td><td>0</td><td>6</td><td>10</td><td>12</td><td>12</td><td>10</td><td>6</td><td>0</td></tr></table>								X	-2	-1	0	1	2	3	4	5	Y	0	6	10	12	12	10	6	0	B2	8 values ✓ B1 at least 6✓
	X	-2	-1	0	1	2	3	4	5																			
	Y	0	6	10	12	12	10	6	0																			
									S1	Appropriate scale use																		
									P1	✓ plotting																		
								C1	✓ curve																			



M1

A1

M1

M1

M1

A1

$$\frac{1}{2} (6 + 10) + \frac{1}{2} (12 + 12) + \frac{1}{2} (12 + 10) + \frac{1}{2} (10 + 6)$$

$$= 8 + 11 + 12 + 11 + 8 = 50 \text{ cm}^2$$

$$\int_{-1}^u (-x^2 + 3x + 10) = \left(-\frac{64}{3} + 24 + 10 \right) - \left(\frac{1}{3} + \frac{3}{2} - 10 \right) = 51 \frac{1}{5} \text{ cm}$$

$$= \% \text{ error } 51 \frac{1}{5} - 50$$

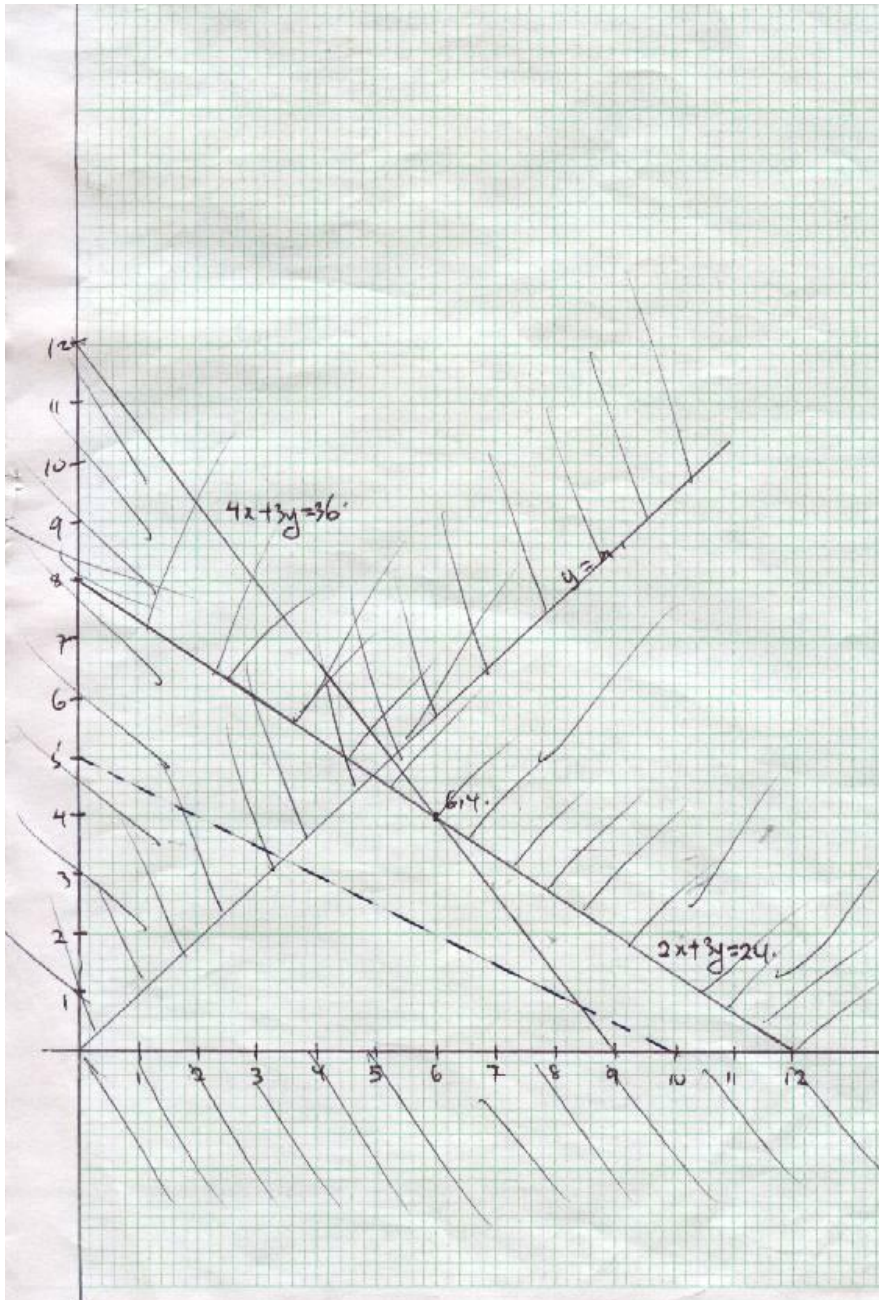
$$= \frac{1 \frac{1}{5}}{51 \frac{1}{5}} \times 100 = 2 \%$$

10

23. a) i) $AC^2 = 8^2 + 6^2 = 100$

M1

	$AC = 10\text{cm}$ ii) $AF^2 = 10^2 + 5^2 = 125$ $AF = 11.18\text{cm}$ b) $\tan x = \frac{5}{11} = 0.5$ $x = 26.52^\circ$ c) $\tan x = \frac{5}{6} = 0.8333$ $x = 39.7^\circ$	A1 M1 A1 B1 M1 A1 B1 M1 A1	 Sketch Sketch
		10	

24		Inequalities $x \geq 0$ $y \leq 0$ $4x + 3y \leq 36$ $4x + 3y = 24$ $y = n$ For ✓ shading of x ≥ 0 and $y \geq 0$ $2x + 3y \leq 36$ $y \leq n$ P profit function object we function $P = 4x + 3y$ Max profit at point (6,4) $P = 4(6) + 4,88(4)$ $= 56$ Hence he should here 6 medium of type A and 4 machine of type B	B1 B1 B1 B1 B1 ✓ shading and line B1 shading and line drawn B1-for ✓ shading and line drawn B1 B1 B1 10
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