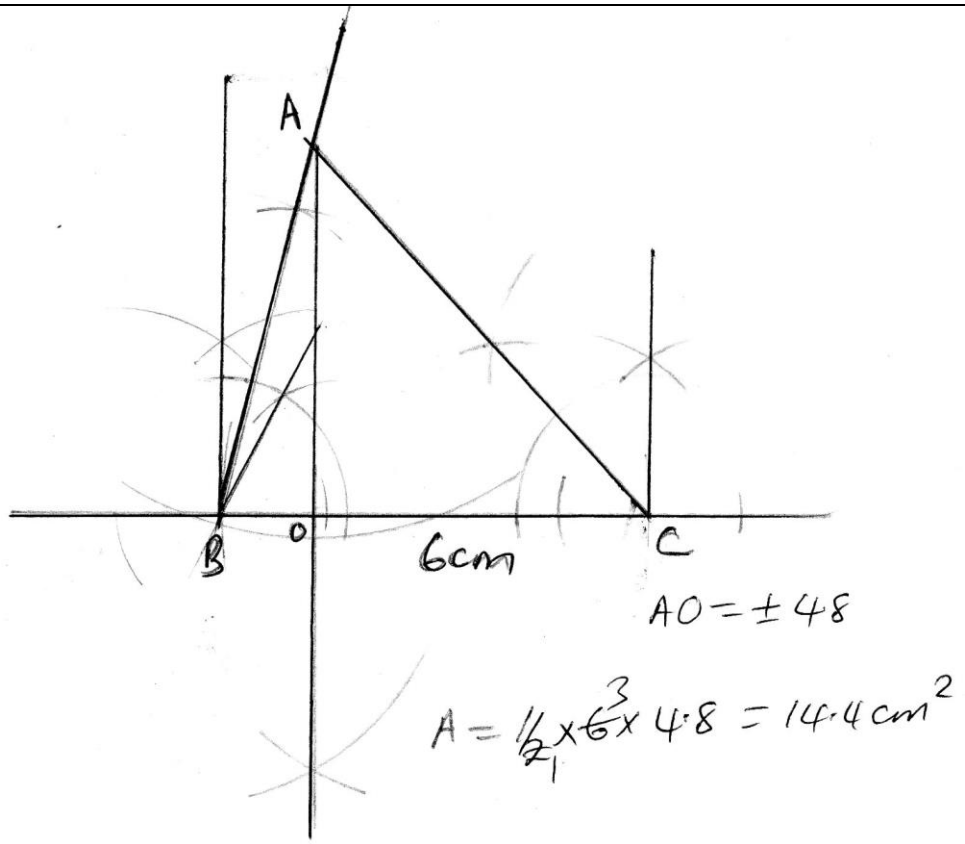
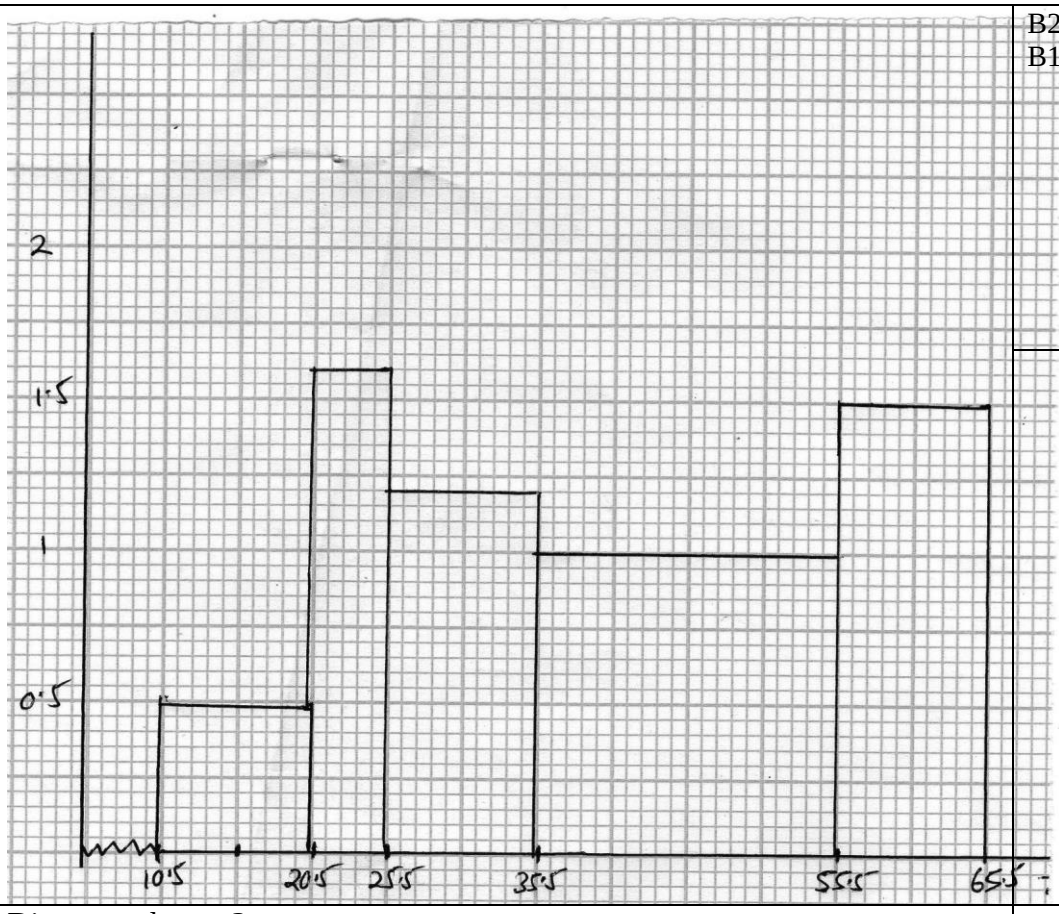
LAINAKU 1 YEAR 2015 FORM FOUR JOINT TRIAL EXAM

1	$=\frac{5}{6}$	M1 M1 A1 3	Numerator denominator
2	$\frac{1}{4}\times\frac{3}{5}=\frac{3}{20}$ *stationary* $\frac{1}{6}\times\frac{9}{20}=\frac{3}{40}$ *PTA* $900{,}000\times\frac{8}{3}$ 2,400,000	M1 M1 A1 3	
3	$\frac{xy+2-5}{(xy-3)(xy+2)}$ $\frac{xy-3}{(xy-3)(xy+2)}$ $\frac{1}{xy+2}$	M1 M1 A1 3	Expression LCM Simplification
4	Sin A=$\frac{15}{17}$ $\cos A=\frac{-8}{17}$ $\frac{\frac{15}{17}}{1+\frac{8}{17}}$ $=\frac{3}{5}$	B1 M1 A1 3	For both
5	2 | 6 8 16 2 | 3 4 8 2 | 3 2 4 2 | 3 1 2 3 | 3 1 1 1 1 1 $2^4\times=48$ 48-1=47 books	M1 A1 B1 3	or equivalent
6	$(3000\times 1)+(5000\times 0.8)$ $\frac{7000}{8000}$ $=0.875g/cm^3$	M1 M1 A1	Total mass

		3	
7	a) $\frac{x}{-3}+\frac{y}{5}=1$ b) $y=\frac{5}{3}x+5$ $m=\frac{5}{3}$ $m_1=\frac{-3}{5}$ $\frac{y+2}{x-1}=\frac{-3}{5}$ $5(y+2)=-3(x-1)$ L_2 $5y=-3x-7$	B1 B1 M1 A1 4	 Gradient of perpendicular or equivalent
8	$0.5245^2=0.2751$ $\sqrt{363.4}=19.063$ $\frac{1}{0.2751}=3.635$ $\frac{1}{319.063}=0.05247$ $(2\times3.635)-(5\times0.05247)$ $=7.27-0.26235$ $=7.00765$	M1 M1 A1 3	For both For both
9		B1 B1 B1 3	ΔABC Perpendicular Area
10	Volume=$\frac{22}{7}\times6(16-9)=132$	M1 M1	

	Density $=\frac{528}{132}$ $=4g/cm^3$	A1 3	
11	L_1= y>-3x-2 L_2= $y \leq -x+2$ L_3= y≥-3x-2	B1 B1 B1 3	
12	Jane: Peter:Kimtai 4: 6: 15 $\frac{15}{25} \times 400{,}000$ =240,000	B1 M1 A1 3	
13	$\frac{5}{3}\begin{pmatrix}4\\7\end{pmatrix}+\frac{2}{-3}\begin{pmatrix}-2\\4\end{pmatrix}$ $\begin{pmatrix}\frac{20}{3}\\\frac{35}{3}\end{pmatrix}+\begin{pmatrix}\frac{4}{3}\\\frac{8}{-3}\end{pmatrix}=\begin{pmatrix}\frac{24}{3}\\\frac{27}{3}\end{pmatrix}$ = (8,9)	M1 M1 A1 3	
14	23950-20,000=3950 $\frac{2}{100} \times 20{,}000+\frac{3.5}{100} \times 30{,}000=1450$ $\frac{2500 \times 100}{5}=50{,}000$ 100,000+50,000 =150,000	M1 M1 M1 A1 3	
15	Relative speed=12km/h Distance covered by A in 2hrs=72km $Time=\frac{72}{12}=6hrs$ 1400+6hrs=2000 hrs or 8:00pm	B1 M1 A1 3	

16 i) ii)	$\Theta=150^o$ $b^2=40^2+40^2-2\times1600\cos 150^o$ $=3200+2771.28$ $=5971.28$ b= 77.27cm	B1 M1 A1 3	
17 a) b) c)	i) $\frac{57600}{x}$ ii) $\frac{57600}{x+4}$ $\frac{57600}{x}-\frac{57600}{x+4}=480$ $X^2+4x=480=0$ $X^2+24x-20x-480=0$ $X(x+24)-20(x+24)=0$ $(x+24)(x-20)=0$ $X=20$ $price\ per\ suit\ \frac{57600}{20}$ =sh 2880 % profit $\frac{720}{2880}\times100$ =25%	B1 B1 M1 M1 M1 M1 A1 M1 A1 M1 A1 10	
18a b) c)	41.375×60=2482.5 $(15.5\times5+23\times x+30.5\times12+45.5\times20+63\times15)=2482.5$ 2298.5+23x=2482.5 23x=184 X=8 CF 5, 13, 25, 45, 60 $35.5+(\frac{30-25)}{20}\times20$ =35+5 =40.5 Frequency densities 0.5, 1.6, 1.2, 1, 1.5	M1 M1 M1 A1 B1 M1 M1 A1 B1 S1	✓ CF Frequency densities

		B2 B1	For all bars At least 3 bars
19 a)	Distance when t=2 $4(2)-4(2)^2+(2)^3=0$m Dist when t=3 $4(3)-4(3)^2+(3)^3= 3$m Distance during 3rd second =3-0=3m Average speed= $\frac{3}{1}$=3m/s	M1 M1 A1	
b)	$\frac{ds}{dt} = 4-8t^2+3t^2$ $3t^2+8t^2+4=0$ $3t^2+6t+2t+4=0$ $(3t-2)(t-2)=0$ $t=\frac{2}{3}t$ t=2	M1 M1 A1	For both
c)	s= $(4\frac{2}{3})-4((4\frac{2}{3})^2+(\frac{2}{3})^3$ $1\frac{5}{27}m$ $S=4(2)-4(2)^2+(2)^3$ =0m	B1 B1	

<table>
<tr><td>d)</td><td>$\frac{dv}{dt} = -8 + 6t$
At t + 3 seconds
-8+6(3)
$10m/s^2$</td><td>M1

A1
10</td><td></td></tr>
<tr><td>20
a)

b)

c)

d)

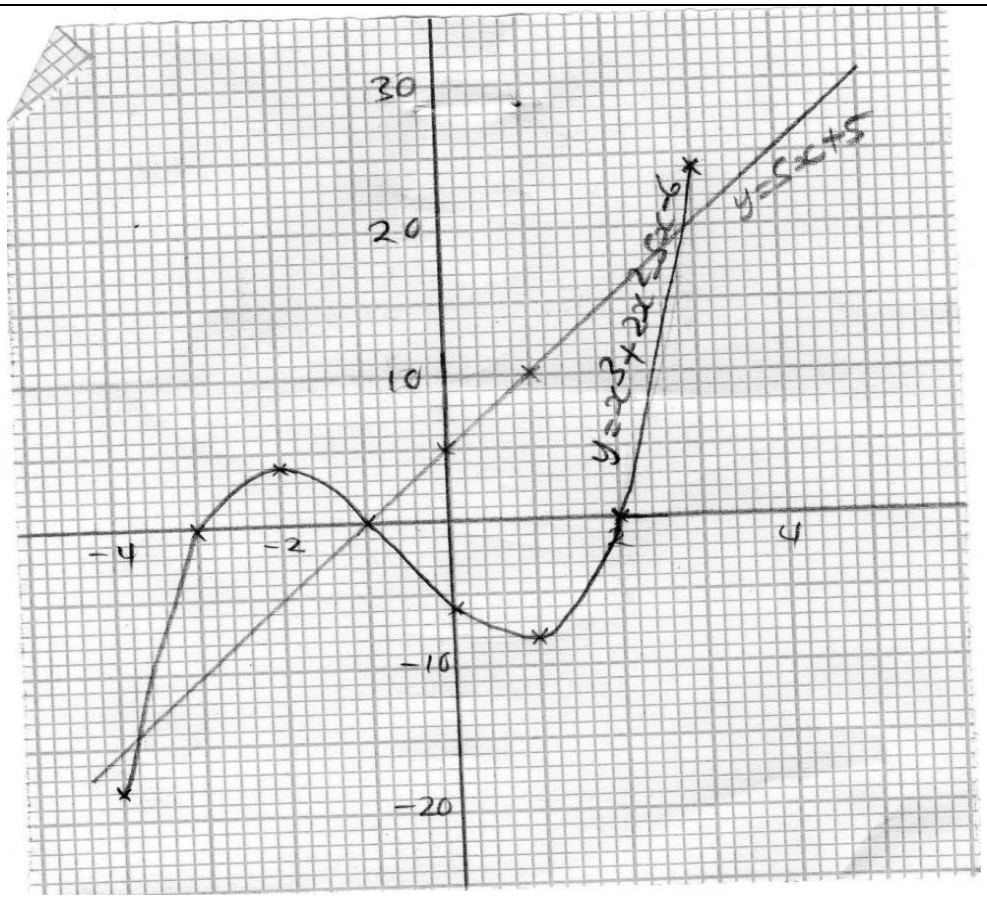
e)</td><td><DCT=60^o
Angle in alternate segment with <DBC
<DBC=60^o
Angles in ΔBCD
<DAB=87^o
Opposite angles in a cyclic quadrilateral ABCD

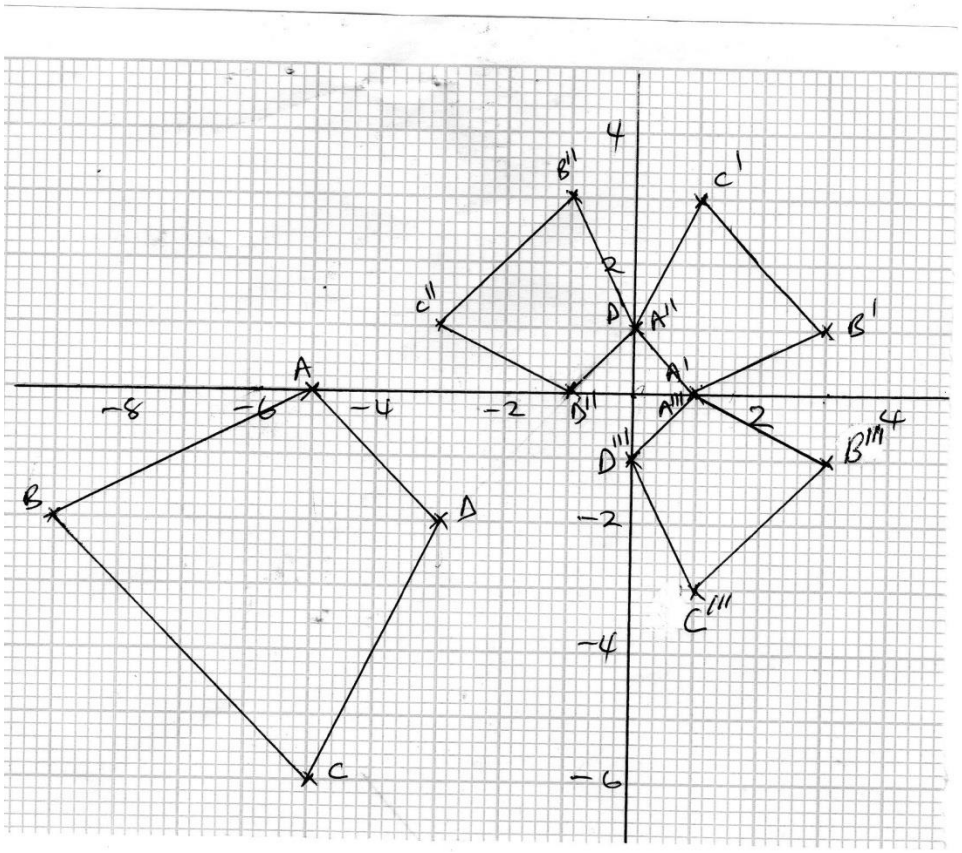
<ADB=33^o
Angles in the same segment with
<ACB
<ABC=120^o
Angles in ΔABC</td><td>B1
B1

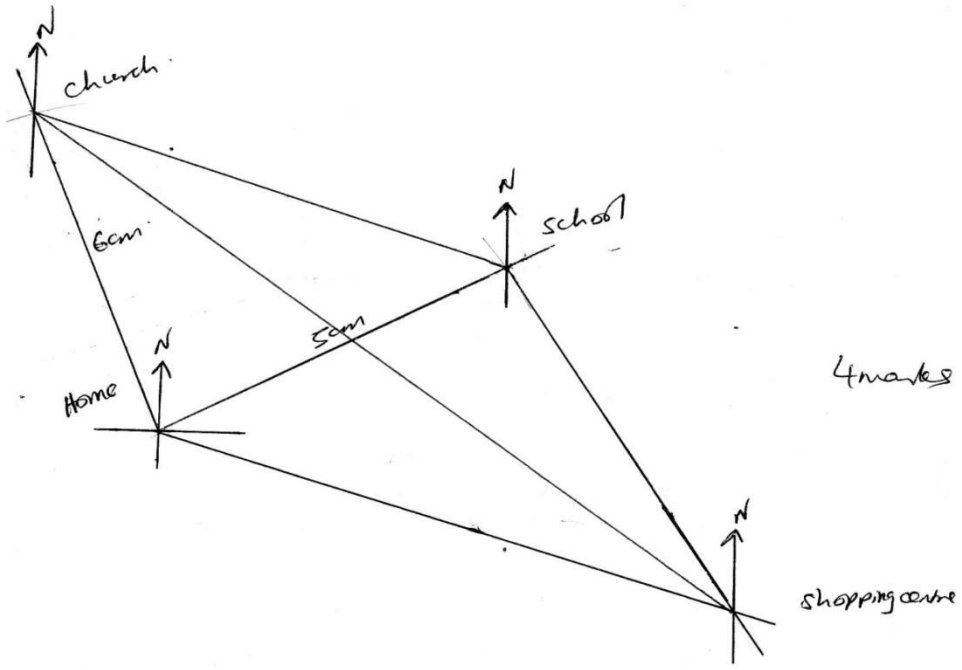
B1
B1
B1
B1
B1
B1
B1
B1
10</td><td></td></tr>
<tr><td>21
a)

b)</td><td><table><tr><td>X</td><td>-4</td><td>-3</td><td>-2</td><td>-1</td><td>0</td><td>1</td><td>2</td><td>3</td></tr><tr><td>y</td><td>-18</td><td>0</td><td>4</td><td>0</td><td>-6</td><td>-8</td><td>0</td><td>24</td></tr></table></td><td>B2

S1
P1
C1</td><td>For all values
✓ B1 for at least 6 √</td></tr>
</table>

c)	 i) X=-3, x=-1 x=-2 ii) Turning point (-2, 4) and (1, 8) iii) $Y=x^3+2x^2-5x-6$ $0=x^3+2x^2-10x-11$ $Y=5x+5$ X=-3.8, x=-1, x=2.8 $\pm$ 0.1	B2 B1 B1 L1 B1 10	For all √ For any 2√ For both

22		B1 B1 B1 B1 B1 B1 B1 B1 B1	✓Quadrilateral ABCD ✓A'B'C'D' ✓LSF ✓Centre ✓Rotation ✓A"B"C"D" plotted ✓Coordinates ✓Quadrilateral A"'B"'C''D"' plotted √ translation √ $A^4B^4C^4D^4$
	b) An enlargement scalefactor $-\frac{-1}{2}$ centre (-1, 0) c) A" (0,1), B"(-1,3), c"(-3,1), D(-1,0) e) $A^4(6,-2)$, $B^4(8,-3)$, $C^4(6,-5)$, $D^4(5,-3)$	10	
23 a)	$\frac{24}{12} = \frac{h+s}{h}$ H=5cm	M1 A1	
b)	Slanting length of the big $\sqrt{24^2+10^2}$=26cm Slanting length of the small $\sqrt{12^2+5^2}$=13	 B1	For both lenght
c)	$3.142 \times 24 \times 26 - 3.142 \times 12 \times 13$ 1960.608-490.152 1470.456cm^2 $\frac{1}{3} \times 3.142 \times 24^2 \times 10 - \frac{1}{3} \times 3.142 \times 12^2 \times 5$ 6032.64-754.08 =5278.56cm^3	M1 M1 A1 M1 M1 M1 A1	
		10	

24	 b) i) $7 \times 30 = 210m$ ii) $9.2 \times 30 = 276m$ iii) $13.7 \times 30 = 411m$ bearing= $310^o \pm 1^o$ iv) $7.5 \times 30 = 225m$ Bearing =$110^o \pm 1^o$	B1 B1 B1 B1 B1 B1 B1 B1 B1 B1 10	

LAINAKU I 2015 JOINT EXAMINATIONS – 2015

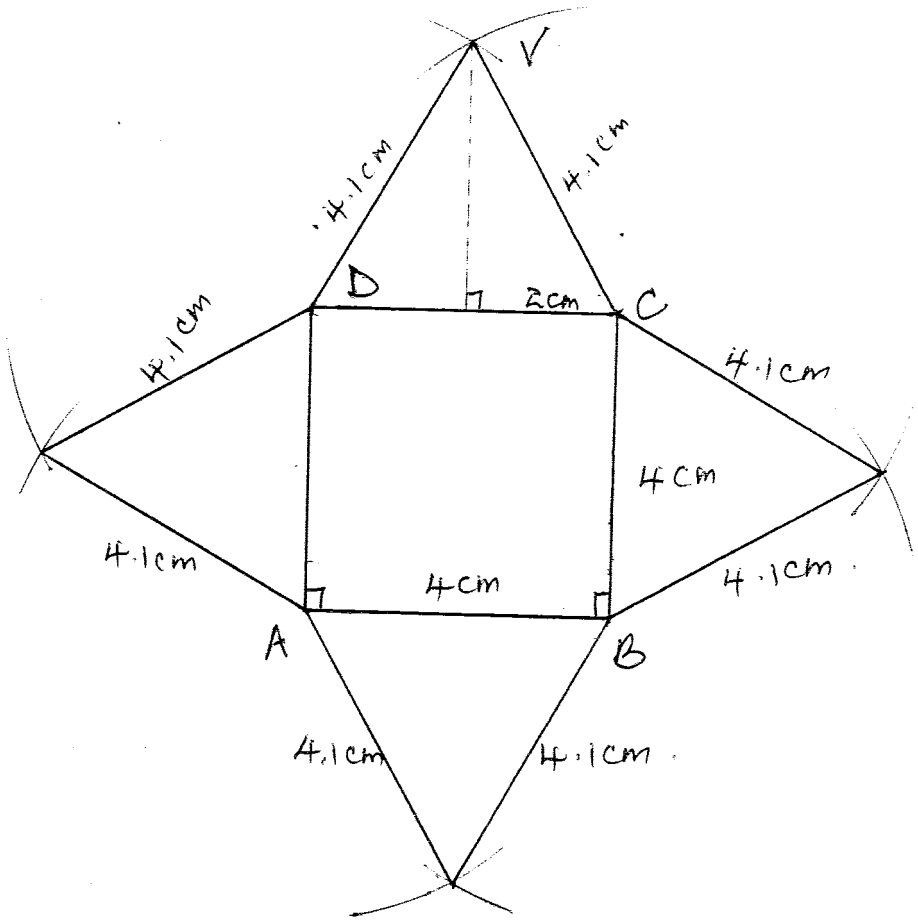
121 /2

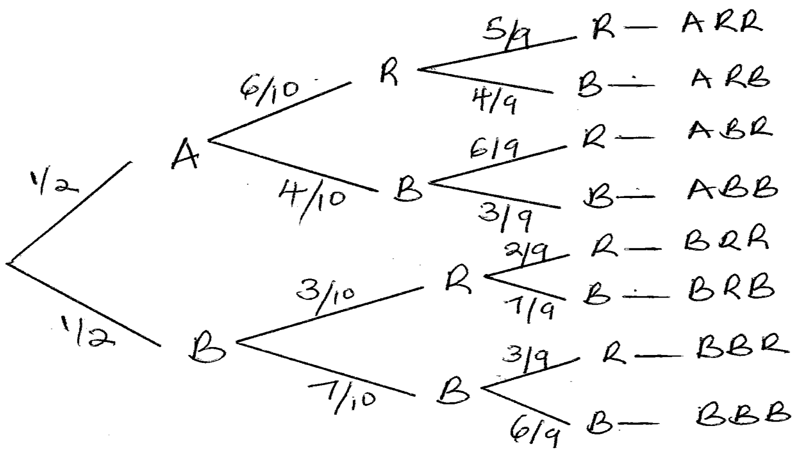
MATHEMATICS

PAPER 2

MARCH/APRIL 2015

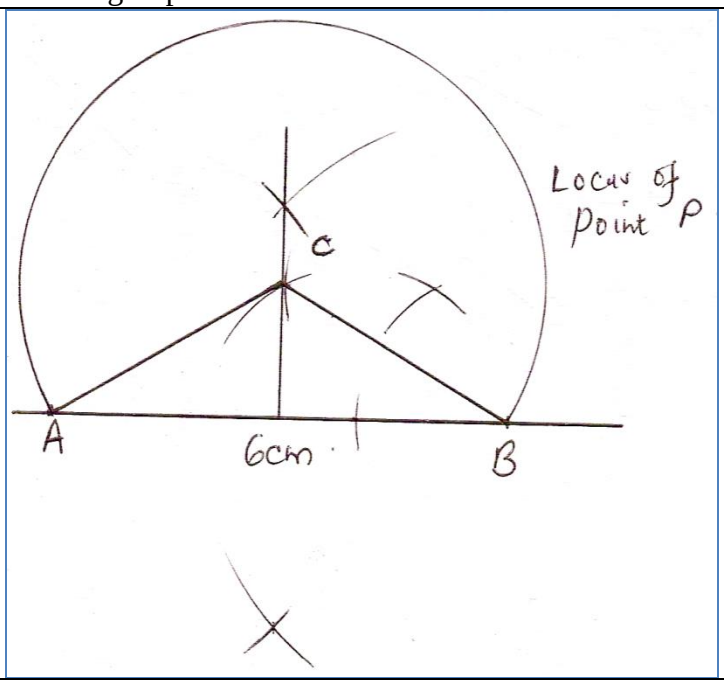
1.	$\left(\frac{0.6812}{7.627 \times 0.3734}\right)^{\frac{1}{2}}$ NO: 0.6812; 7.627; 0.3734; 0.4890 LOG: $\bar{1}.8332$; 0.8824; $\bar{1}.5722$ (+); $\underline{0.4546}$; $\underline{\bar{1}.3786}$ (−); $\frac{\bar{2}+1.3786}{2}$; $\bar{1}.6893$	B1 M1 M1 A1	Find ✓ reciprocal and ✓reading of log 5 All logs ✓ All operations +, - and ÷✓ Accept std form
		4 Mks	
2.	$d^3 = \frac{p^2 - 2q}{q - p^2}$ $d^3(q - p^2) = p^2 - 2q$ $\left(d^3 q + 2q\right) = p^2 + d^3 p^2$ $p^2\left(1 + d^3\right) = d^3 q + 2q$ $p = \pm\sqrt{\frac{d^3 q + 2q}{1 + d^3}}$	M1 M1 A1	
		3 Mks	
3.	$1 - 5 \times (5x) + 10 \times (5x)^2 - 10 \times (5x)^3$ $= 1 - 25x + 250x^2 - 1250x^3$ $1 - 5x = 0.95$ $-5x = -0.05$ $x = 0.01$ $1 - (25 \times 0.01) + (250 \times 0.01^2) - (1250 \times 0.01^3)$ $1 - 0.25 + 0.025 - 0.00125 = 0.77375$ $= 0.7738$	M1 A1 M1 A1	
		4 Mks	
4.	$log_2(x^2 - 9) = 3log_2 2 + log_2 x$ $log_2(x^2 - 9) = log_2 8 + log_2 x$ $log_2(x^2 - 9) = log_2 8x$ $x^2 - 9 = 8x$	M1	For ✓ dropping logs For ✓ x = ± 5 ⇒CAO

	$x^2 - 8x - 9 = 0$ $x^2 + x - 9x - 9 = 0$ $x(x+1) - 9(x+1) = 0$ $x = -1, x = 9$	M1 A1	
		3 Mks	
5.	$\frac{1}{2}x + 2 \leq 5 - \frac{1}{4}x$ $\frac{1}{2}x + \frac{1}{4}x \leq 5 - 2 \equiv \frac{3}{4}x \leq 3$ $x \leq 4$ $5 - \frac{1}{4}x < \frac{6}{8}x + 8$ $5 - 8 < \frac{1}{4}x + \frac{6}{8}x$ $-3 < x$ *hence the integral values* $-2, -1, 0, 1, 2, 3, 4$	B1 B1 B1	
		3 Mks	
6.		B1 B1	✓Net ✓labling

	$Area = 4 \times 4 + \frac{1}{2} \times 4 \times \sqrt{4.1^2 - 2^2}$ $= 16 + 2 \times 3.579 = 16 + 7.158$ $= 23.158 cm^2$	B1	
		3 Mks	
7.	a)  	B1	Tree diagram
	b) $1 - \left[\left(\frac{1}{2} \times \frac{6}{10} \times \frac{5}{9}\right) + \left(\frac{1}{2} \times \frac{3}{10} \times \frac{2}{9}\right)\right]$ $1 - \left(\frac{1}{6} + \frac{1}{30}\right)$ $1 - \frac{1}{5}$ $= \frac{4}{5}$	M1 A1	
		3 Mks	
8.	$\frac{3}{2 - \sqrt{8}} - \frac{2}{2 + \sqrt{8}} = \frac{3}{2 - 2\sqrt{2}} - \frac{2}{2 + 2\sqrt{2}}$ $= \frac{3(2 + 2\sqrt{2}) - 2(2 - 2\sqrt{2})}{4 - 8}$ $\frac{6 + 6\sqrt{2} - 4 + 4\sqrt{2}}{-4}$ $\frac{2 + 10\sqrt{2}}{-4} = -0.5 - 2.5\sqrt{2}$ $a = -0.5, b = -2.5, c = 2$	M1 M1 A1	
		3 Mks	
9.	a) Co – ordinate of		

	A $Centre\ A = \left(\frac{13-3}{2}, \frac{3-9}{2}\right)$, $A(5,-3)$ b) $r = \sqrt{(5--3)^2 + (-3--9)^2} = \sqrt{8^2+6^2} = 10$ $(x-5)^2 + (y+10)^2 = 10^2$ $x^2 - 10x + 25 + y^2 + 6y + 9 = 100$ $x^2 - 10x + y^2 + 6y - 66 = 0$	B1 B1 B1	Or equivalent
		3 Mks	
10.	$\begin{pmatrix}2 & 3\\1 & 2\end{pmatrix}$ $Det = ((2\times 2)-(1\times 3)) = 1$ $inverse = \begin{pmatrix}2 & -3\\-1 & 2\end{pmatrix}$ $\frac{2x+3y=17}{2}$ $\frac{2x+4y=20}{2} = \begin{matrix}2x+3y=17\\x+2y=10\end{matrix}$ $\begin{pmatrix}2 & -3\\-1 & 2\end{pmatrix}\begin{pmatrix}2 & 3\\1 & 2\end{pmatrix}\begin{pmatrix}x\\y\end{pmatrix} = \begin{pmatrix}2 & -3\\-1 & 2\end{pmatrix}\begin{pmatrix}17\\10\end{pmatrix}$ $\begin{pmatrix}x\\y\end{pmatrix} = \begin{pmatrix}34-30\\-17+20\end{pmatrix} = \begin{pmatrix}4\\3\end{pmatrix}$ $x = 4, y = 3$	B1 B1 M1 A1	
		4 Mks	
11.	$3p = p\left(\frac{100+\frac{16}{2}}{100}\right)^{2n}$ $3 = 1.08^{2n}$ $log3 = log1.08^{2n}$ $log3 = 2nlog1.08$ $2n = \frac{log3}{log1.08} = \frac{0.4771}{0.0334}$ $2n = 14.284$ $n = 7.142$ $hence\ n = 7years$	M1 M1 M1 A1	
		3 Mks	
12.	$\left(\frac{0.5}{40} + \frac{0.5}{80}\right)\times 100$ $= \frac{3}{160}\times 100$	M1	

	$= 1\frac{7}{8}\%$	A1	1.875%
		2 Mks	
13.	$b^2 = 12^2 + 10^2 - 2 \times 10 \times 12Cos120^0$ $b^2 = 144 + 100 - 240 \times -0.5$ $b^2 = 244 + 120 = 364$ $b = \sqrt{364}$ $= 19.08cm$ $AK = \frac{19.08}{2} = 9.54cm$	M1 A1 B1	
		3 Mks	
14.	$6.4^2 = x(9.6 + x)$ $40.96 = x^2 + 9.6x$ $0 = x^2 + 9.6x - 40.96$ $x = \frac{-9.6 \pm \sqrt{9.6^2 - (4 \times 1 \times -40.96)}}{2 \times 1}$ $x = \frac{-9.6 \pm \sqrt{92.16 + 163.84}}{2}$ $x = \frac{-9.6 \pm \sqrt{256}}{2}$ $x = \frac{-9.6 \pm 16}{2} = \frac{16 - 9.6}{2}$ $\frac{6.4}{2}$ $x = 3.2cm$ $EC = 3.2 + 9.6 = 12.8cm$	M1 A1 B1	Or equivalent
		3 Mks	
15.	$L.S.F. = \sqrt[3]{\frac{2560}{5000}} = \frac{4}{5}$ $A.S.F = \left(\frac{4}{5}\right)^2 = \frac{16}{25}$ $Area\ of\ the\ bigger\ one = \frac{25 \times 256}{16}$ $= 400cm^2$	 B1 M1 A1	
		3 Mks	

16.		B1 B1 B1	60^0✓ly constructed Triangle ABC Locus of P
		3 Mks	
17.	a) $Distance = \frac{60+60}{360} \times \frac{22}{7} \times 6370 \times 2$ $= 13{,}346\frac{2}{3}\ Km$ b) $\emptyset \times 60^0 \times Cos60^0 = 480 \times 8$ $\emptyset = \frac{480 \times 8}{60^0 \times 0.5} = 16 \times 8$ $= 128^0$ $C\left(60^0N, (128-62)^0W\right)$ $C\left(60^0N, 66^0W\right)$ c) Time difference = $\frac{128 \times 4}{60}$ = 8hrs 32mins local time at C = 1730hrs – 8hrs 32 Min Local time C = 8.58 a.m d) Total distance moved = $(120 \times 60)nm + (128 \times 60 \times Cos\ 60)nm$ $7200 + 3840$ $= 11{,}040nm$	M1 A1 M1 M1 A1 B1 M1 A1 M1 A1	

		10 Mks	
18.	a) $A = \frac{k \times \sqrt{B}}{C^2}$ $4 = \frac{k \times \sqrt{64}}{5^2}$ $k = \frac{4 \times 25}{8} = \frac{100}{8}$ $= 12.5$ $A = \frac{12.5\sqrt{B}}{C^2}$ b) $A = \frac{12.5 \times \sqrt{16}}{10^2} = \frac{12.5 \times 4}{100} = \frac{50}{100}$ $= 0.5$ c) $Change\ in\ A = \frac{k \times \sqrt{\frac{100+44}{100}B}}{\left(\frac{100-20}{100}C\right)^2}$ $= \frac{k \times \sqrt{1.44B}}{(0.8C)^2}$ $A = \frac{1.2}{0.64}\ \frac{k\sqrt{B}}{C^2}$ $A = 1.875\ \frac{k\sqrt{B}}{C^2}$ $= 1.875$ $\%Change\ in\ A = \left(\frac{1.875 - 1}{1}\right) \times 100$ $= 0.875 \times 100$ $= 87.5\%\ Increase$	M1 M1 A1 B1 M1 A1 M1 A1 M1 A1	Value of the constant
		10 Mks	
19.	a) Portion filled in one minute $\frac{1}{6} + \frac{1}{24} + \frac{1}{36} - \frac{1}{72} = \frac{12+3+2-1}{72}$ $= \frac{2}{9}$	M1 A1	

a) (i) Portion filled in 1½ min

$\frac{2}{9}\times\frac{3}{2}=\frac{1}{3}$ B1

(ii) work done in 1minutes 12 seconds.

$\frac{1}{6}+\frac{1}{24}$ M1

$=\frac{5}{24}\times 1\frac{12}{60}=\frac{5}{24}\times\frac{6}{5}$ M1

$=\frac{1}{4}$

Total work done in 2 minute 42 seconds

$\frac{1}{3}+\frac{1}{4}$ M1

$=\frac{7}{12}$ A1

(c) Portion left unfilled after 2 minutes 42 seconds.

$\left(1-\frac{7}{12}\right)\div\left(\frac{1}{36}-\frac{1}{72}\right)=\frac{5}{12}\div\frac{1}{72}=\frac{5}{12}\times 72$ M1

$= 30\ minutes$

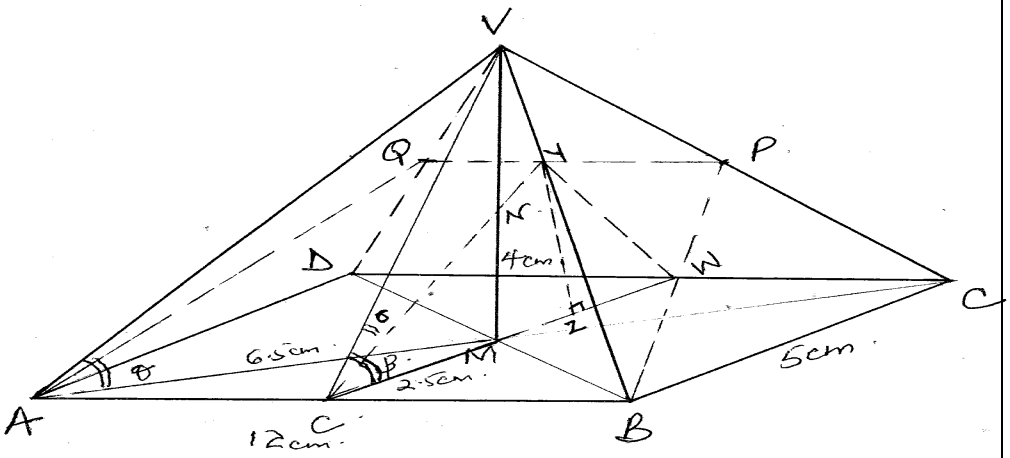
Totaltime taken

$= 2minutes\ 42\ seconds + 30\ minutes$ M1

$= 32minutes\ and\ 42\ seconds$ A1

10 Mks

20.



a) *i)* $AC=\sqrt{12^2+5^2}=\sqrt{144+25}=\sqrt{169}$ M1

$= 13cm$ A1

ii) $Tan\ \theta\ (\angle VAM)=\frac{8}{6.5}=1.2308$ M1

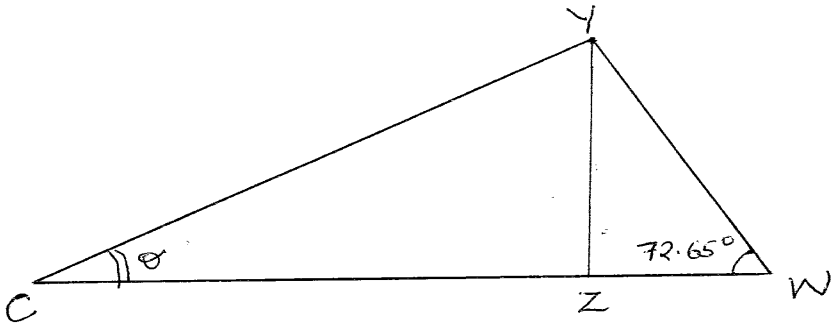
$\theta = 50.91^0$ A1

iii) $Tan\beta\ (\angle VCM)=\frac{8}{2.5}=3.2$ M1

$\beta = 72.65^0$ A1

b) $CV = WV = \sqrt{8^2 + 2.5^2} = \sqrt{70.25} = 8.382cm$

$WY = \frac{1}{2}WV = \frac{1}{2} \times 8.382 = 4.191cm$



c) $Sin72.67^0 = \frac{YZ}{4.191} YZ = 4.191 \times Sin72.65^0 = 4.191 \times 0.9545$

YZ= $4.000cm$

$Cos72.65^0 = \frac{ZW}{4.191}$ $ZW = Cos72.65^0 \times 4.191 = 0.2982 \times 4.191$

$ZW = 1.250$

$Hence\ CZ = 5 - 1.25 = 3.75cm$

$Tan\ \theta(\angle YCZ) = \frac{4}{3.75} = 1.067\ \theta = 46.86^0$

$Tan\ \sigma(\angle VCY) = 72.65^0 - 46.86^0$

$\sigma = 25.79^0$

B1 For CV or WY

M1

M1

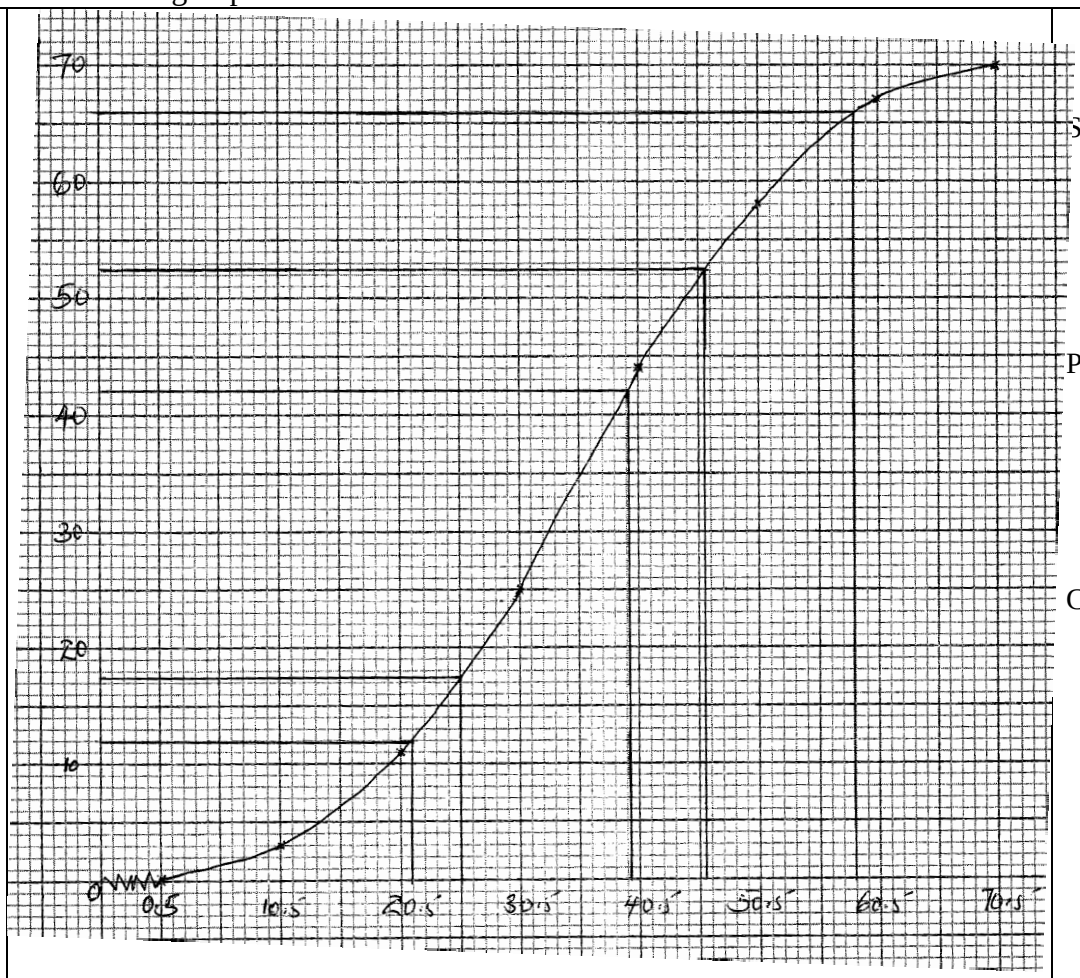
A1

10 Mks

21.

Mass		1-10	11-20	21-30	31-40	41-50	51-60	61-70
f		3	8	14	19	14	9	3
UCB	0.5	10.5	20.5	30.5	40.5	50.5	60.5	70.5
c.f.	0	3	11	25	44	58	67	70

B1 For the CF



S1

P1

C1

i) The 60th percentile

$\frac{60}{100} \times 70 = 42^{nd} Entry$ B1

$60th\ percentile = 39.5g$

B1

ii) The quartile deviation

$Q_1 Entry = \frac{1}{4} \times 70 = 17.5^{th}\ Entry\ \ Q_1 = 25.5g$

For Q_1 or Q_3

M1

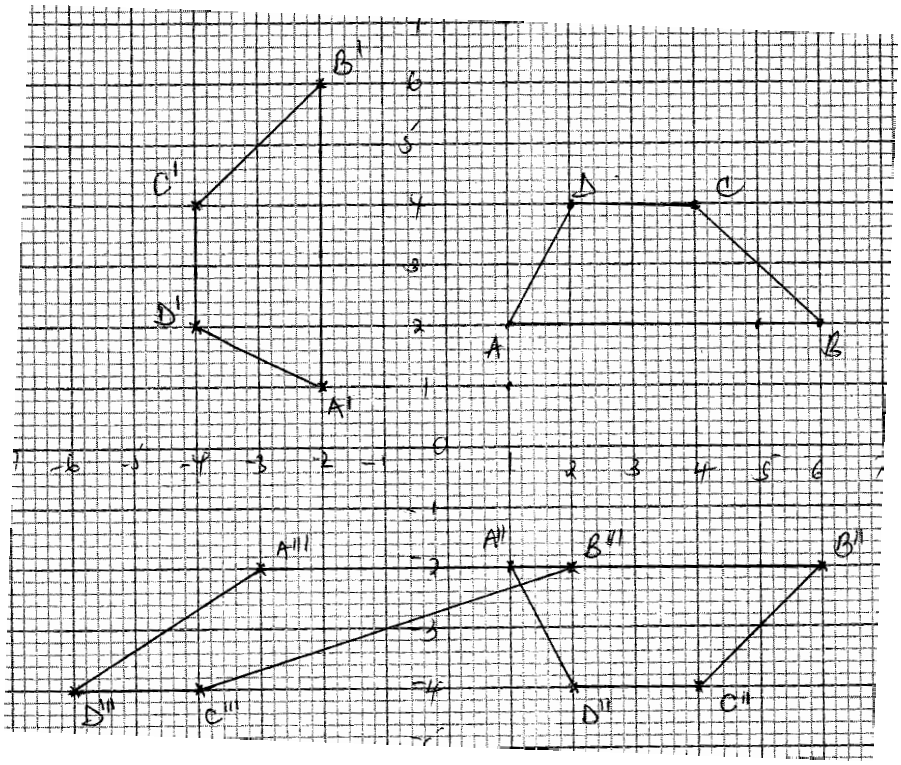
$Q_3 Entry = \frac{3}{4} \times 70 = 52.5^{th}\ Entry\ \ Q_3 = 46.g$ quartile deviation $= \frac{Q_3 - Q_1}{2} = \frac{46 - 25.5}{2}$

$= \frac{20.5}{2}$

A1

$= 10.25$

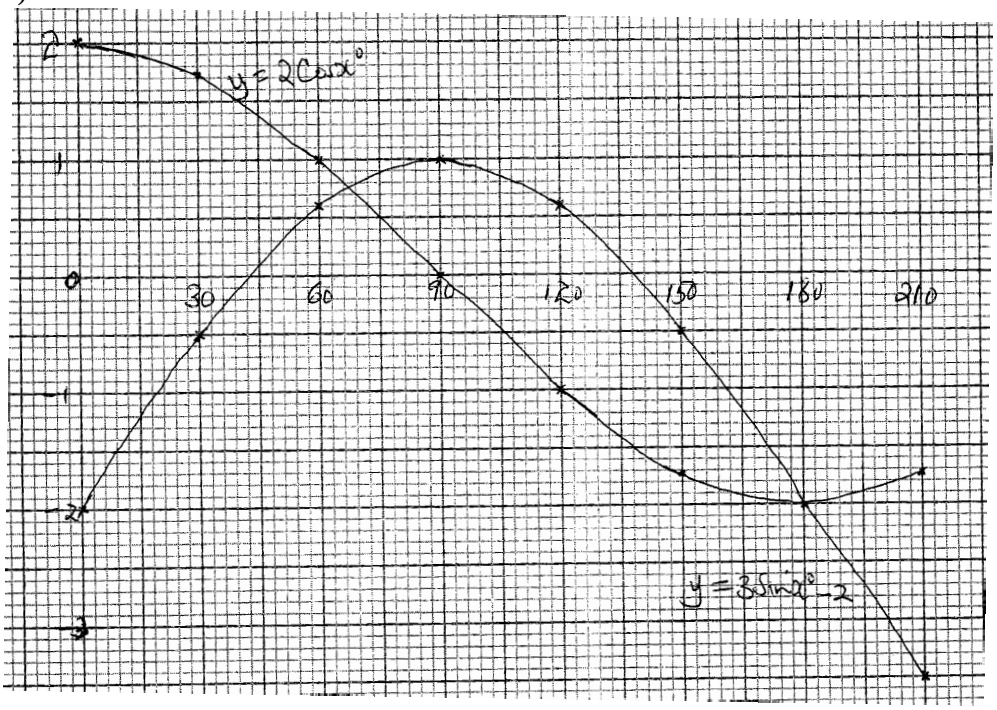
	iii) The percentage of passion fruits to the nearest two decimal places whose masses lie in the range 21.5g to 58.5g. $\frac{66-12}{70}\times 100=\frac{54}{70}\times 100$ $=77.14\%$	M1 A1	
		10 Mks	
22.	a) $\frac{128}{2^{2x+2}}=\frac{4^{3x}}{128}\equiv\frac{2^7}{2^{2x}}=\frac{2^{2(3x)}}{2^7}$ $=2^{7-(2x+2)}=2^{6x-7}$ $7-2x-2=6x-7\equiv 5-2x=6x-7$ $5+7=6x+2x\equiv 12=8x$ $=x=1.5$ b) $third=2^{2\times 1.5+2}, fourth=128\ fifth=4^{3\times 1.5}$ $hence\ \ third=32, fourth=128\ fifth=512$ $r=\frac{512}{128}\ or\ \frac{128}{32}$ $=4$ c) $S_{10}=\frac{2(4^{10}-1)}{(4-1)}=\frac{2\times(1048576-1)}{3}$ $=\frac{2\times 1048575}{3}$ $=699{,}050$ d) $a=8\ d=32-8=24\ S_{30}=\frac{30}{2}\left(2\times 8+24(30-1)\right)$ $=15(16+29\times 24)=15\times 712$ $=10{,}680$	M1 A1 M1 M1 A1 B1 M1 A1	
		10 Mks	
23.	a) $\begin{pmatrix}0 & -1\\ 1 & 0\end{pmatrix}\begin{pmatrix}A & B & C & D\\ 2 & 6 & 4 & 2\\ 2 & 2 & 4 & 4\end{pmatrix}=\begin{pmatrix}A' & B' & C' & D'\\ -2 & -2 & -4 & -4\\ 1 & 6 & 4 & 2\end{pmatrix}$	B1	

	$A'B'C'D'$ on the grid 	B1 B1	Object ✓ly plotted and drawn Image 1 ✓ly plotted and drawn
	(b) $\begin{pmatrix}0 & 1\\1 & 0\end{pmatrix}\begin{pmatrix}A' & B' & C' & D'\\-2 & -2 & -4 & -4\\1 & 6 & 4 & 2\end{pmatrix}$	M1	
	$=\begin{pmatrix}A'' & B'' & C'' & D''\\1 & 6 & 4 & 2\\-2 & -2 & -4 & -4\end{pmatrix}$	A1	
	$A''B''C''D''$ on the grid	B1	
	(c)(i) $\begin{pmatrix}1 & K\\0 & 1\end{pmatrix}\begin{pmatrix}6\\-2\end{pmatrix}=\begin{pmatrix}2\\-2\end{pmatrix}$	M1	
	$\equiv 6-2K=2,$ $-2K=-4$ $HENCE\ K=2$		
	$\begin{pmatrix}1 & 2\\0 & 1\end{pmatrix}$ Shear matrix	A1	
	(ii) $\begin{pmatrix}1 & 2\\0 & 1\end{pmatrix}\begin{pmatrix}A'' & B'' & C'' & D''\\1 & 6 & 4 & 2\\-2 & -2 & -4 & -4\end{pmatrix}=\begin{pmatrix}A''' & B''' & C''' & D'''\\-3 & 2 & -4 & -6\\-2 & -2 & -4 & -4\end{pmatrix}$	B1	
	$A'''B'''C'''D'''$ on the grid	B1	
		10 Mks	
24.	a) To complete the table below by filling the blank spaces		

x^0	0	30	60	90	120	150	180	210

$y = 3\ Sin\ x^0 - 2$	-2	-0.5	0.60	**1**	**0.60**	**-0.5**	**-2**	**-3.5**
$y = 2Cos\ x^0$	2	1.73	1	**0**	**-1**	-1.73	**-2**	**-1.73**

b)



c)

$y = 3\ Sin\ x^0 - 2Cos\ x^0 = 2$

$y = 3\ Sin\ x^0 - 2 = 2Cos\ x^0$

$x_1 = 67.5^0, x_2 = 180^0$

d) State the amplitude of

a) $y = 3\ Sin\ x^0 - 2 = 3$

b) $y = 2Cos\ x^0 = 2$

B2

S1
P1
C1
P1
C1

B1

B1
B1

B_1 for 6✓

$y = 3\ Sin\ x^0 - 2$
For $y = 3\ Sin\ x^0 - 2$
For $y = 2Cos\ x^0$
For $y = 2Cos\ x^0$

10 Mks