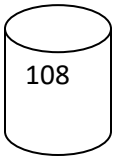
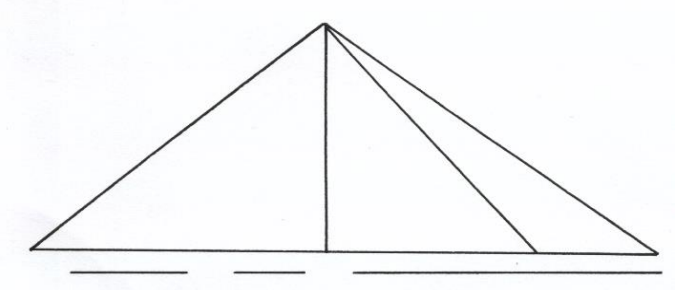
1.	$\sqrt{\frac{0.8064 \times 1000}{1.008 \times 10000} \times \frac{6.048 \times 10000}{0.134 \times 1000}}$ $\sqrt{\frac{80.64 \times 6048}{4008 \times 1344}}$ 9 4 2 4 x 9 = 36	B 1 B 1 A1
2.	-4 (-4 ⅓) - 12 3 5 $\frac{-4 \times -8}{-4}$ -8	B1
3.	Sin (2θ 30^0) Cos 4θ 0 Sin (20 30^0) Cos 4θ A 1 B 1 90^0 Θ $\frac{120^0}{6}$ =20^0	A1 B 1 B1 A 1
4.	Let 52x be U $5^{2X}(5^3)$ $20(5^{2X})$ = 625 25U 20U = 625 125 $\frac{5U}{5} = \frac{625}{5}$ U = 125 52x 53 2x = 3 X = $^3/_2$	B1 B1 A 1
5.	The sum of n sides polygon in degrees (n -2) 180^0 Angles in quadrilateral add up to 360^0 5 (x + 4) + 4(x + 5) + 2(x + 10) + (x +20) + 360^0 (x+20) = 360^0 12x = 360 X = 30^0 Interior angles 5(x+4)=170^0 4(x+5)=140^0 2(x+10)=40^0 X+20=10^0	A 1 B 1 B 1

	Exterior angles 180^0 170^0 10^0 180^0 140^0 40^0 180^0 40^0 140^0 180^0 10^0 170^0	gles correct ee angles correct No mark for 1 or less correct angles
6.	140 x 1240 1736 100 Selling price 75 x 1736 100 Ksh 1302	B 1 B 1 A 1
7.	Co-odinates A are (-1,7) B are (3,-5) C are (6,-4) AB $\begin{pmatrix}3\\5\end{pmatrix}$ - $\begin{pmatrix}-1\\7\end{pmatrix}$ $\begin{pmatrix}4\\-12\end{pmatrix}$ BC $\begin{pmatrix}0\\4\end{pmatrix}$ - $\begin{pmatrix}3\\-5\end{pmatrix}$ $\begin{pmatrix}-3\\9\end{pmatrix}$ 4BC -3 -3 AB hence BC parallel to AB. They share a common point B hence collinear.	B 1 B 1 B 1
8.	1 man $\begin{pmatrix}2\\4\end{pmatrix}$ x 1 in 3 days 4 hr a day 1 man $\begin{pmatrix}2\\4\end{pmatrix}$ x $\begin{pmatrix}1\\4\end{pmatrix}$ in 3 days 1 hr a day 1 man $\begin{pmatrix}2\\4\end{pmatrix}$ x $\begin{pmatrix}1\\4\end{pmatrix}$ x $\begin{pmatrix}1\\3\end{pmatrix}$ acres in 1 day 1 hr a day $\begin{pmatrix}2\\4\end{pmatrix}$ x $\begin{pmatrix}1\\4\end{pmatrix}$ x $\begin{pmatrix}1\\3\end{pmatrix}$ x 5 x 4 x 3 men $\begin{pmatrix}2\\4\end{pmatrix}$ x $\begin{pmatrix}1\\4\end{pmatrix}$ x $\begin{pmatrix}1\\3\end{pmatrix}$ x 4 days x 3 days 1 man 0.5 acres 4 day in 3 hrs 1 day 5 half 0.5 0.5 10 men	B 1 B 1 A 1
9.	($30cm^3$) 12 ASF $\frac{108}{12}$ 3 LSF ASF 3 V? VSF (LSF^3) 2 $\frac{810}{V1}$ 27 V1 = $\frac{810}{27}$ = $30cm^3$   V = 810	B 1 B 2 A 1

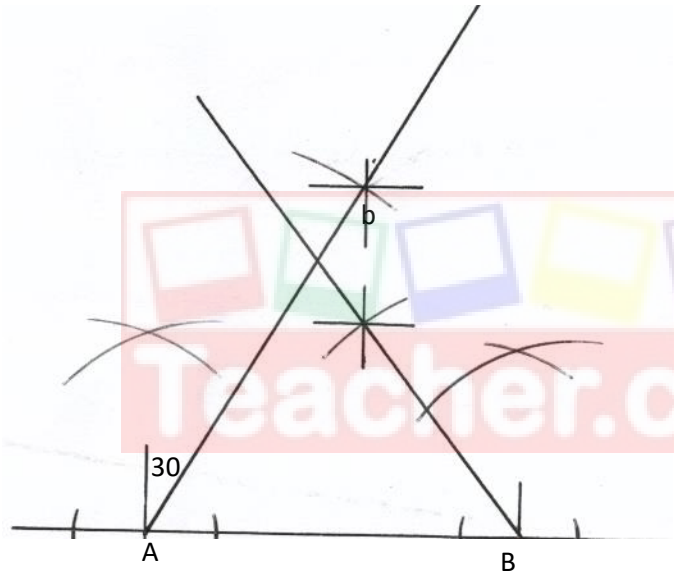
10.	Area of triangle ADB is $^1/_2$ x 7 x 125 to 60^0 7 x 6 sin 60^0 = 36.37 cm^2 b) Area of unshaded sector 60 x 22 x 7 x 7 = 25.6667 360 7 Shaded area 36.37 25.67 10.7 cm^2	A1 M1 B1
11.	-7 x X < 3x + 2 2x < 9,x7 4-5 3x+2<4(x 5), 3x + 2 < 4x 20 -x < -22, x > 22 If x > -5 and x > 22 22	M1 M1 A1
12.	(3.5) $\begin{bmatrix} 2p & \sqrt{x} \\ & 3x-5 \end{bmatrix}$ (3x 5)95^2 $4p^2$ x x 3x 5 27x 5^2 455^2 $4p^2x$ $27x5^2$ - $4p^2x$ 455^2 X(275^2 $4p^2$) 455^2 X 455^2 275^2 $4p^2$	Square both sides M1 M2 A1
13.	Max val of x 13.45 min 13.35 Max val of y 4.35 min 4.25 Max value of x 13.45 3.1647 Y 4.25 Max value of x 13.35 3.069 Y 4.35 Actual value of x 13.4 3.1163 Y 4.3 Absolute error 3.1642 3.069 0.04785 2 Pere em 0.04785 x 100 0.015355 x 100 3.1163 1.5355%	B1 B1
14.	Gradient of AB is M-1 M- 1 4 2 2 Gradient product is -1 Gradient of second line Y 5 2x is 2 3 3 m-1 3 2 2 2m -2 = 6 2m = 8 M = 4	

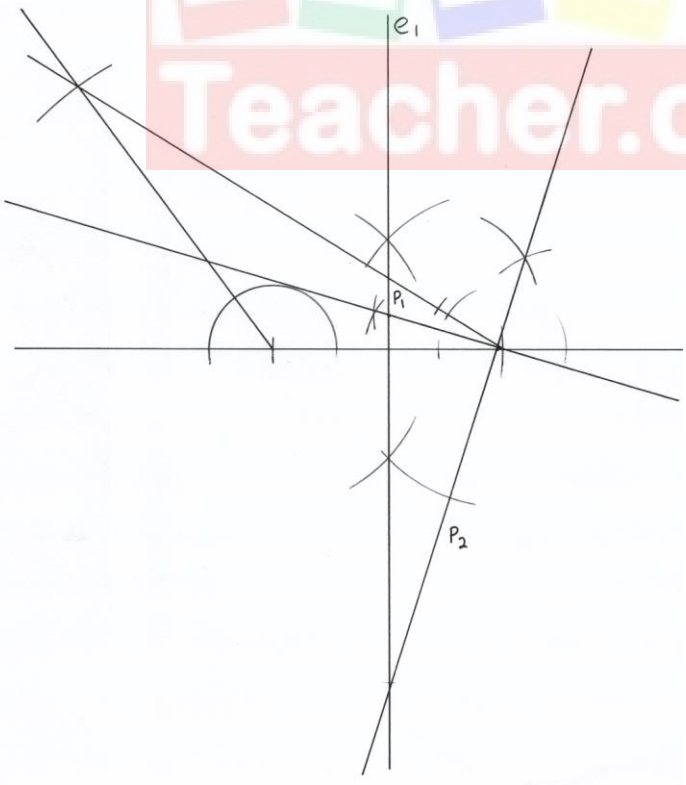
15.	Principal p amount 2p 2p p(I + 10)n 2p - p (1+0.1)n 100 p p 2 (1 1)n Log 2 n log 1.1 N log 2 0.301 Log 1.1 0.0414 N = 7.27 Round upto 8 N = 8 yrs	B1 B1 A1
16.	P(black) and p(brown) or p(brown and p(black) $\left[\frac{5}{8} \times \frac{3}{7}\right] \times \left[\frac{3}{8} \times \frac{4}{7}\right]$ 15 3 56 14 27 56	B1 B1 A1

17	400km Nairobi ——— busia Speed = 120 km/hr Distance = 400 km Time = 400 120 = 3hrs 20min 8.30 + 3 hrs 20min 11: 50 a.m	M1 A1
	b) at 8.30 am distance covered by bus ½ x 80 = 40km Distance left = 360 km Speed = 2000km/hr Time = 360 = 1 hr 48 min 200	 B1 B1
	They met at 8.30 + 1 hr 48min 10.18 am	 M1 A1
	c) 8 – 10.18 is 2 hrs 18min	

	Distance = 2 x 80 + $\frac{18}{60}$ x 80	M1
	160 + 24	
	184km from Nairobi.	A1
	d) Car arrived in Nairobi after 3 hrs 20 min	
	bus travelled at a time of	
	3hrs 20 min + 30 min	
	= 3hrs 50 min	
	Dist = 3 x 80 = $\frac{50}{60}$ x 80	
	= 240 + 66 $^1/_3$	M1
	= 93$^1/_3$km	
	Distance from Busia is 93$^1/_3$ km	A1
18	ABC	B1
	Y - = -x drawn	B1
	$A^1B^1C^1$ draw (rotated)	B2
	$A^{11}B^{11}C^{11}$ draw (translated)	B2
	$A^{111}B^{111}C^{111}$ Enlarged	B2
	A^{1v} (2,6) B^{1v} (0,0) C^{1v} (-6,2)	B1
19		M1

	$x^2 + x^2 = (56 - 2x)^2$	M1
	$2x^2 = 4x^2 - 224x + 3136$	
	$2x^2 - 224x + 3136 = 0$	
	$X^2 - 112x + 1568 = 0$	
	$X(x - 16) - 98(x - 16) = 0$	M1
	$(x-16)(x - 98) = 0$	
	$X = 16$ or 98	A1
	Height = 16 cm	M1
	$\tan\theta = \frac{16}{35} = 0.4575$	A1
	$= 24.57^o$	
		M1
	b) $ST = \sqrt{16^2 + 35^2}$	
	$= \sqrt{1481}$	A1
	$= 38.48$	
	c) Muximum distance	M1
	$= 35 \pm 16$	A1
	$= 51$	
20	a) $50{,}00 + \frac{6}{100} \times 62\,5000 + 10000 \times 250$	M1
		M1
	$50{,}000 + 37500 + 25{,}000$	A1
	$= 112{,}5000$	
		M1
	b) i) $12000 \times 2.5 + 0.06x + 50{,}000 = 134\,000$	
	$30{,}00 + 50{,}000 + 0.06x = 134\,000$	M1

	$0.06x = 134\,000 - 80\,000$ $\frac{0.06x}{0.06} = \frac{54000}{0.06}$ $x = 900{,}000$	 M1 A1	
	ii) increase = 900 000 – 625 000 = 275,000 % increase = $\frac{275\,000}{625\,000} \times 100$ = 44 %	M1 M1 A1	
21	Distance covered in 90 min Bl P = 540km Q = 360 km Scale 1 cm = 10 000 000 cm 1 cm rep 100 km  Distance btwn plane 2,1 cm ± 0.1 2 10 ± 10 Bearing of plane Q from plane P 185 ± 1°	B1 B1 B1 B1 B1 B1 B1 B2	 For A & B 5cm 030° & 5.4 to P 315° & 3.6 to Q Completed diagram

22	a) $\frac{40}{24} = \frac{x+56}{x}$ $40 = 24x + 1344$ $x = 84$ vol $= \frac{27}{3} \times \frac{1}{3} \times 40^2 \times 140 - \frac{22}{7} \times \frac{1}{3} \times 24^2 \times 84$ $= \frac{183978.67}{1000}$ $= 183.978$ litres b) $\frac{40}{140} = \frac{r}{h}$ $\frac{2}{7} = \frac{r}{h}$ $h = \frac{7r}{2}$ $\frac{3}{4} \times \frac{22}{7} \times \frac{1}{3}(40^2 \times 140 - 24^2 \times 84) = \frac{22}{7} \times \frac{1}{3}(7r^3 - 24^2 \times 84)$ $\frac{3}{4}(40^2 \times 140 - 24^2 \times 84) = \frac{7r^3}{2} - 24^2 \times 84)$ $\frac{3}{4} \times 175516 = \frac{7r^3}{2} - 48384$ $180096 \times \frac{2}{7} = r^3$ $\sqrt[3]{r^3} = \sqrt[3]{51456}$ $r = 37,19$	M A1 M1 A1 M1 M1 M1 M1 A1	In terms of 8
23		B1 B1 B1 B2 B1 B1 B1 B1	120o constructed Length AB and AC accurate Δ ABC completed L1 l2 shown Bisector of ∠ABC $P_2 \perp$ to P_2 drawn above Showing 2 positions fro P_2 Showing P_1 & P_2 Measurement 9.8 cm

24.	a) ACC = $\frac{15-0}{20}$ $= 0.75 m/s^2$ b) Dece = $\frac{0-15}{20}$ $= -0.75$ c) Area = $\frac{1}{2}$ x 20 x 15 $= 150ml$ d) Area = 20 x 15 $= 300m$ e) Area = $\frac{1}{2}$(30 + 60) X 15 $= 675m$	M A1 M1 A1 M1 A1 M1 A1 M1 A1	