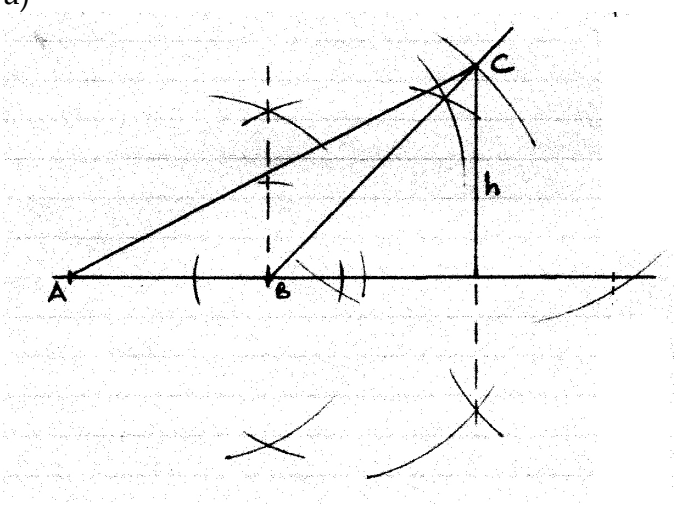
MATHEMATICS MARKING SCHEME 2021

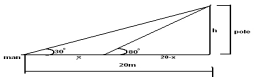
1.	2 + = 2 hours 2 x 120 = 320 km = 80 litres 80x59 = 4720 sh.	B1 M1 A1
		03
2.	$x + 80 = 180 \Rightarrow x = 100$ $180 - 128 = 52$ $52n + 100 = 360$ - - - - - - - $52n = 260$ $n = 5$ - - - - - - $n = 5 + 1 = 6$ - - - - - -	M1 M1 A1
		03
3.	a)  b)	B1 B1 B1

	$h = 4.2 \pm 0.1$ cm – – – – – – –	B1
	$A = \frac{1}{2} \times 4 \times 4.2$	
	$= 8.4\ cm^2$ – – – – – – – –	
		04
4.	2x – 2 -2 – 1 -3 B1 for -3 3x + 1 < x + 11 2x < 10 X<5 B1 for x < 5 -3 Integral values -3,-2, -1, 0, 1,2,3,4 B1 – All correct integral values	B1 B1 B1 B1
		03
5.	√ √[] =	M1 M1 A1
		03
6.	ASF == LSF = √ = VSF= $()^3 = {}^{8}/_{27}$ Vol= x162 $=48cm^3$	 M1 M1 A1
		03
7.	0.5 x14x8 sin θ=28m²	M1

	Sin θ=0.5 θ=Sin^{-1} (0.5) θ =30°	A1
		02
8.	Tuesday-Thursday=24x3=72hours Monday=2400-0445=19hours 15minutes Friday=18hours 45minutes Total time=72+19.25+18.75=110hours Time lost=0.5x110=55minutes 1845hrs-55minutes=1750hours =5.50pm	B1 M1 A1
		03
9.	N=9t^2-25a^2=(3t-5a)(3t+5a) D=6t^2+19at+15a2=6t^2+9at+10at+15a^2 =3t(2t+3a)+5a(2t+3a) =(3t+5a)(2t+3a) N=(3t-5a)(3t+5a) D (3t+5a)(2t+3a) =3t-5a 2t+3a	M1 M1 A1
		03
10.	$\frac{5}{63.34} - \sqrt[3]{0.0169}$ $= 5\left(\frac{1}{63.34}\right) - \sqrt[3]{16.9\times10^{-3}}$ $= 5\times0.01579 - 2.566\times10^{-1}$ $= -0.17765$	M1 M1 A1
		03
11. (a)	$M = \frac{15,132,000}{75.66}$ $= 200,000\ US\ Dollars$ $\frac{15,132,000}{126.64}$	M1 A1 M1 A1
(b)	11944 Sterling pounds	

		04
12.	$Marked\ price = \frac{100}{90} \times 7200$ $= sh\ 8\ 000$ Selling price =x 8000 =sh6400	M1 M1 A1
		03
13.		
		04
14.	Let the no. be $10x + y = 5(x + y) \ldots\ldots\ldots\ldots\ldots\ldots (i)$ $(10y + x) - (10x + y) = 9 \ldots\ldots (ii)$ $-4y + 5x = 0$ $9y - 9x = 9$ $-36y + 45x = 0$ $36y - 36 = 36$ $9x = 36$ $x = 4$ $\therefore y = 5$ $\therefore The\ number\ is\ 45$	M1 M1 A1
		03

Log	*No*
1.5649 $\bar{1}.3256 +$ 0.8905 $\bar{2}.2682 -$ $\bar{2}.6223$ $\frac{\bar{2}.6223}{3}$ $\frac{\bar{3}+1.6223}{3}$ $\bar{1}.5408$	*36.72* *(0.46)*$^2 \Rightarrow 2(\bar{1}.6628)$ *3.474 x 10*$^{-1}$ *= 0.3474*

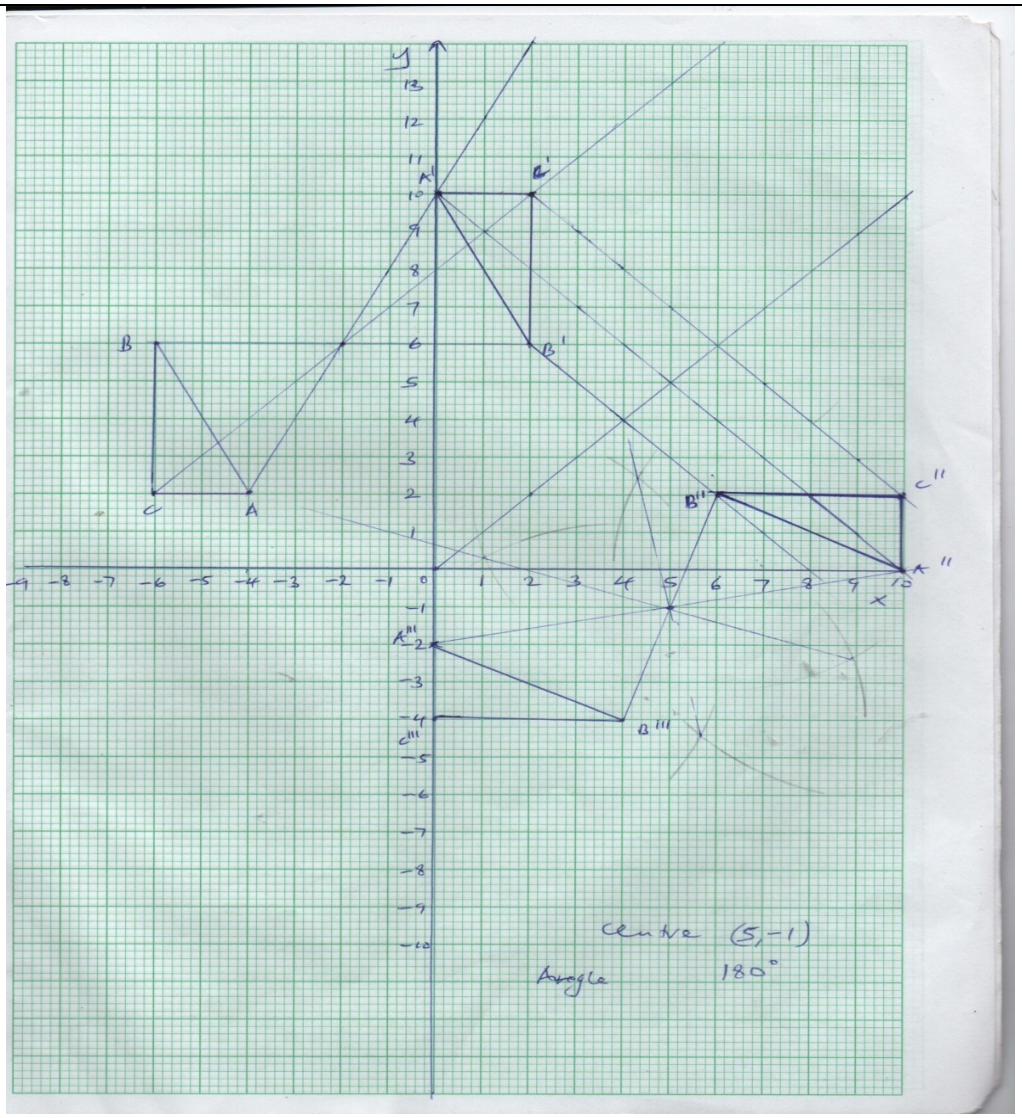
15.	 $Tan\ 80^0 = \dfrac{h}{20-x}$ $\Rightarrow h = (20-x)\tan 80 \ldots\ldots\ldots\ldots\ldots\ldots (i)$ $Also \quad \tan 30 = \dfrac{h}{20}$ $\Rightarrow h = 20\tan 30 \ldots\ldots\ldots\ldots\ldots\ldots (ii)$ $\therefore 20\tan 30 = (20-x)\tan 80.$ $11.547 = 113.425 - 5.6711x$ $5.671x = 101.878$ $x = 17.96$ $\cong 18m$	M1 M1 A1
		03
16.	Sin 4y = Cos 2y $4y^0 + 2y^0 = 90^0$ $6y^0 = 90^0$	
		02
17. (a)	Surface area of hemisphere=$2\pi r^2$ S.A= $2x\pi\ x1.5^2$ $14.14cm^2$ Surface area of cylindrical part 2π rh S.A=$2x\pi$ xrxh 2 T.S.A=14.14+61.29 =$75.43cm^2$	M1 M1 M1 A1 M1
(b)	Volume of hemispherical part=$2/3\ \pi r^3$ =$2/3x\pi x1.5^3$ =$7.071cm^3$	A1

(c)	Volume of cylindrical part=$\pi r^2 h$ $=\pi x 1.5^2 x 6.5$ $=45.96cm^3$ T. volume=7.069+45.96 $=53.04cm^3$ Density=M/v =10/53.04 $=0.1886g/cm^3$	M1 A1 M1 A1
		10
18. (a) (i) (ii) (iii) (b) (C)	**AB = b - a** **OC** = **BD = a - b** **OX**=**b**(1-h)+ **OX**=**b**(1-h)+ **OX**=+ **a**h = 2 h = k **b** k=**b** (1-h) k=1 - h (2 h)=1 - h h =1 ⟹ h = K=2() = K = ***a***+	A1 A2 A1 A1 M1 M1 M1 A1

(d)		A1
		10
19. (a)	$\frac{y-3}{x+1}=\frac{1}{2}$ $y-3=-\frac{1}{2}x-\frac{1}{2}$ $y=-\frac{1}{2}x+\frac{5}{2}$	M1 A1
(b)	$g=\frac{5--3}{4-1}$ $=\frac{8}{3}$	 A1
(c)	$\frac{y-5}{x-4}=\frac{8}{3}$ $y-5=\frac{8}{3}x-\frac{32}{3}$ $y=\frac{8}{3}x-\frac{32}{3}+5$ $y=\frac{8}{3}x-\frac{17}{3}$	M1 A1
(d)	$y=\frac{-3}{8}x+5$	M1 M1 A1
(e)	$\frac{y-5}{x-4}=-\frac{1}{2}$ $y=-\frac{1}{2}x+7$	M1 A1
20.	$\frac{1200}{x}$	B1 M1

	$\frac{1200}{x}+10\ldots\ldots\ldots\ldots\ldots\ldots(i)$ $\frac{1200+200}{x-5}=\frac{1400}{x-5}\ldots\ldots\ldots\ldots\ldots\ldots(ii)$ $\Rightarrow \frac{1200}{x}+10=\frac{1400}{x-5}$ $x^2-25x-600=0$ $x^2-40x-15x-600=0$ $x(x-40)+15(x-40)=0$ $x=-15 \quad or \quad x=40$ $\Rightarrow No.\ of\ \ people=40-5=35$ $\frac{1400}{35}=Sh\ 40.$	M1 M1 M1 M1 M1 M1 A1
		10
21.	Total ratio = 8+14+3=25 Material $\Rightarrow \frac{8}{25}\times 1250=400$ Labour $\Rightarrow \frac{14}{25}\times 1250=700$ Transport $\Rightarrow \frac{3}{25}\times 1250=150$ 2004 Material $\Rightarrow 400\times 2=800$ Labours $=\frac{130}{100}\times 700=910$ Transport $\Rightarrow \frac{120}{100}\times 150=180$ Total in $2004=(1800+910+180)$ = Sh 1890 In 2005 increased to 1981due to labour only $\therefore 800+\left(\frac{x+100}{100}\times 910\right)+180=1981$ $\left(\frac{x+100}{100}\right)91=198-980$ $x+100=\frac{10010}{91}\ \ x+100=100$ $x=10$ $\%increase=10\%$	B1 B1 B1 M1 M1 A1 M1 M1 M1 A1
		10
22.	(a) a =	

	2.75 = t= = 8 sec (b) Distance = ½ x 8 x 22 = 88m (c) 847 = ½ (40+t) + 32) x 22 847 = ½ (72 +t) x 22 1694 = (72+t) 22 = 72 + t T = 5 sec T = 40 +t = 40+5 = 45 sec. (d) a = = = -4.4m/s^2	 M1 M1 A1 M1 A1 M1 M1 A1 M1 A1
		10
23.		



A1
A1

A′(0,10)
B′(2,6) 3
C′(2,10)

A″(10,2)
B″(6,2) 3
C″(10,2)

ABC =2

24.

(a)

Class	Tally	Frequency	CF
20 - 27	//	2	2
28 - 35	//// //	7	9
36 - 43	///	3	
44 - 51	////	4	
52 - 59	//// /	6	
60 - 67	///	3	

	12 16 22 25 (b) Median = L + i = 43.5 + 8 = 43.5 + = 43.5 + 1 = *44.5*	