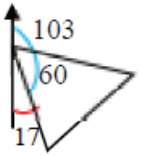
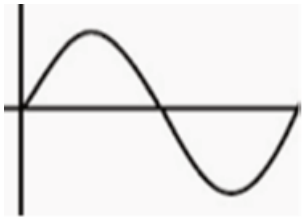
Question	Answer	Marks	AO Element	Notes	Guidance
1(a)	Congruent	**1**			
1(b)	37.5 or 37.48 to 37.49	**2**		**M1** for $\cos [ABC =] \frac{7.3}{9.2}$	
2	2.1	**2**		**M1** for $\frac{33.6 \times 25000^2}{100000^2}$ oe or answer figs 21	
3(a)	5.5	**2**		**M1** for $\frac{x}{4.5} = \frac{9.9}{8.1}$ oe	
3(b)	16.7 or 16.73 to 16.74	**2**		**M1** for $25 \times \left(\frac{8.1}{9.9}\right)^2$ oe or $25 \times \left(\frac{4.5}{their\ 5.5}\right)^2$ oe	
4	$[u =]$ 20 $[v =]$ 52 $[w =]$ 108 $[x =]$ 36	**4**		**B1** for each	

Question	Answer	Marks	AO Element	Notes	Guidance
5	343	**2**		**B1** for 103 in correct position **and** 60 or 17 in correct position  	
6(a)	370 or 370.2 to 370.3	**2**		**M1** for 864 ÷ *their* time	
6(b)	991 or 990.5 …	**4**		**M2** for $864^2 + 928^2 - 2 \times 864 \times 928 \cos 67$ or **M1** for correct implicit version **A1** for 981100 to 981110	
6(c)(i)	313	**2**		**M1** for 180 + 133 or 360 – 47	

Question	Answer	Marks	AO Element	Notes	Guidance
6(c)(ii)	[0]79.5 to [0]79.6 …	**4**		**M2** for $\frac{928 \times \sin 67}{their 991}$ or $\frac{864 \times \sin 67}{their 991}$ oe or **M1** for implicit form of either **A1** for [angle *HGB* =] 59.5 to 59.6 … or [angle *HBG* =] 53.4 or 53.37 to 53.42 **M1 dep** for *their* angle *HGB* + 20 leading to answer or for 133 – *their* angle *HBG* leading to answer	
7(a)	 Correct sketch to go through (0, 0), (180, 0) and (360, 0)	**2**		**B1** for correct sine curve shape through the origin	

Question	Answer	Marks	AO Element	Notes	Guidance
7(b)	199.5 or 199.47… and 340.5 or 340.52 to 340.53…	**3**		**B2** for one correct or **M1** for $\sin x = -\frac{1}{3}$ oe If 0 scored, **SC1** for two reflex angles with sum of 540 or two non-reflex angles with sum of 180	
8(a)	87.[0] or 86.98 to 86.99	**3**		**M2** for $\sqrt{82^2 + 55^2 - 2 \times 82 \times 55 \times \cos 76}$ oe OR **M1** for $82^2 + 55^2 - 2 \times 82 \times 55 \times \cos 76$ oe **A1** for 7570 or 7566 to 7567	
8(b)	66.1 or 66.2 or 66.13 to 66.17	**3**		**M2** for $\frac{82 \times \sin 76}{their(\mathbf{a})}$ oe or **M1** for $\frac{82}{\sin C} = \frac{their(\mathbf{a})}{\sin 76}$ oe	

Question	Answer	Marks	AO Element	Notes	Guidance
8(c)	13.3 or 13.30 to 13.31	**3**		**M2** for $AG = 55\cos 76$ oe or **M1** for recognition that CG is perpendicular to AB	
8(d)	54.1 or 54.13… **and** 125.9 or 125.86 to 125.87	**5**		**B4** for 54.1 or 54.13… or 125.9 or 125.86 to 125.87 or **M3** for $[\sin Q =] \dfrac{0.5 \times 82 \times 55 \times \sin 76}{0.5 \times 90 \times 60}$ oe or **M2** for $0.5 \times 82 \times 55 \times \sin 76 = 0.5 \times 60 \times 90 \times \sin Q$ oe or **M1** for $0.5 \times 82 \times 55 \times \sin 76$ oe or for $0.5 \times 60 \times 90 \sin Q =$ *their* area of ABC If **B4** not scored then **SC1** for two angles seen that sum to 180 (from use of sine ratio) but not 0 and 180.	

Question	Answer	Marks	AO Element	Notes	Guidance
9(a)	20.8 or 20.76 to 20.79	**4**		**B3** for [BC =] 10.4 or 10.38 to 10.39… or $6\sqrt{3}$ oe or **M2** for $(2x)^2 + x^2 + 6^2 = 24^2$ oe or **M1** for $24^2 - 6^2$ oe or $x^2 + 6^2$ oe or $(2x)^2 + 6^2$ oe or $x^2 + (2x)^2$ oe or **SC2** for final answer of $12\sqrt{5}$ or 26.8 or 26.83… OR **M3** for $x^2 + \left(\frac{x}{2}\right)^2 + 6^2 = 24^2$ oe or **M2** for $x^2 + \left(\frac{x}{2}\right)^2$ or **M1** for $x^2 + 6^2$ oe or $\left(\frac{x}{2}\right)^2 + 6^2$ oe or $24^2 - 6^2$ oe	

Question	Answer	Marks	AO Element	Notes	Guidance
9(b)	14.5 or 14.47 to 14.48	**3**		**M2** for $\sin[\ldots] = \frac{6}{24}$ oe or **M1** for recognising the correct angle *GAC*	
10	**M1** for angle *ACB* = 65° or angle *RPQ* = 37° **A1** for 2 pairs of equal angles oe	**2**			
					[Total: 55]