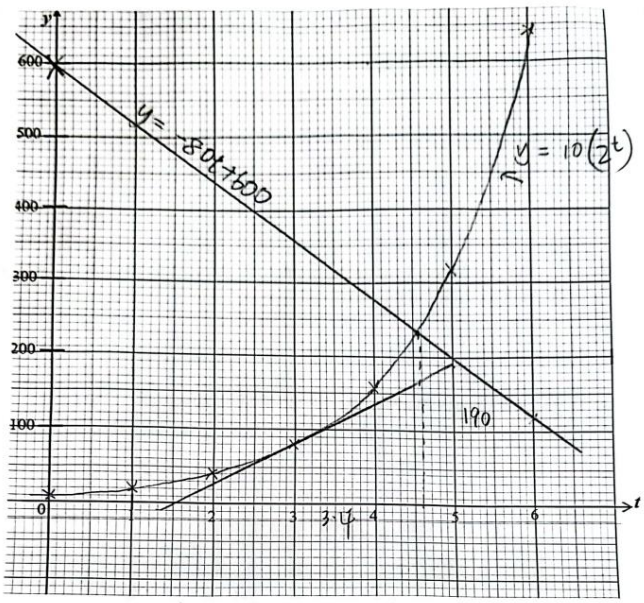
Marking Scheme
Secondary 4 Exp
Mathematics 4052/2

Anglo-Chinese School
(Barker Road)

1	**(a)(i)**	42.25			
	(ii)	$\frac{1}{2}at^2 = s - ut$ $a = \frac{2(s-ut)}{t^2}$			
	(b)	$(x-4)(2x-1) = 9$ $2x^2 - x - 8x + 4 = 9$ $2x^2 - 9x - 5 = 0$ $(2x+1)(x-5) = 0$ $x = -\frac{1}{2}$ or $x = 5$			
	(c)	$8x - 6y = 36$ $18x + 6y = 3$ $x = \frac{3}{2}$ $y = -4$			
2	**(a)(i)**	In triangle *CFD* and triangle *BFA*, Angle *CDF* = angle *BAF* (angle in the same segment) Angle *ABF* = angle *DCF* (angle in the same segment) Angle *CFD* = angle *BFA* (Vert. opp angles) By AA similarity test, the triangles are similar.			
	(ii)	$BC = 10\tan 48°$ $= 11.106\text{cm}$ $\frac{1}{2} \times 10 \times 11.106$ $= 55.5\text{cm}^2$			
	(b)(i)	$\text{radius} = \frac{60}{100} \times 21.5 + 8(2.54) = 33.22$ circumference= $2 \times \pi \times 33.22$=208.727cm=2.087m or 2.09m			
	(ii)	$2.087 \times 50 = 104.35 = 104\text{m}$ (to 3 sig fig)			
3	**(a)**	160			
	(b)	All 7 points plotted			
		Smooth curve through plotted points.			

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		 Grad = 190/3.4 ≈ 55			
	(c)(i)	Drawing of tangent at $t = 3$			
		55.5			
	(ii)	The micro organisms are increasing at rate of 55.5 per day after 3 days.			
	(d)	Drawing of line $y = -80t + 100$			
		4.6			
4	**(a)(i)(a)**	28			
	(b)	37-24 =13			
	(a)(ii)	35			
	(a) (iii)	$\frac{12.5}{100} \times 80 = 10$ 45 marks			
	(a)(iv)	**Disagree.** Test 1, 12.5% scored distinction, **Test 2, 25 % scored distinction**. High proportion of students scored distinction in Test 2.			
	(b)(i)	56.1			
	(ii)	9.98			
5	**(a)**	$\frac{57600 - 56000}{56000} \times 100\%$ $= 2.86\%$			

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	(b)	$\text{TA} = 25000\left(1+\frac{1.6}{100}\right)^5$ $= \$27065.03$ $\text{Total interest} = \$27065.03 - \$25000$ $= \$2065.03$			
	(c)(i)	London Hotel £160=S$271.19 Berlin Hotel 160€=S$249.60 The hotel in London is more expensive because It costs more at S$271.19>a stay in Berlin Hotel at S$249.60.			
	(ii)	$3 \text{ nights in London} = 271.19 \times 3 = 813.57$ $5 \text{ nights at Berlin } 249.60 \times 5 = 1248$ $\text{Total} = 2061.57 \times \frac{103.35}{100}$ $= 2130$ (correct to 10 dollars)			
6	**(a)(i)**	$\overrightarrow{AB} = \begin{pmatrix} 3 \\ -4 \end{pmatrix}$ $\lvert\overrightarrow{AB}\rvert = 5\text{units}$			
	(ii)	$\frac{k}{9} = \frac{-4}{3}$ $k = -12$			
	(b)(i) **(a)**	**a-b**			
	(b)	$\frac{3}{5}(2\text{a}+\text{b})$			
	(c)	$\text{a-b}+\frac{3}{5}(2\text{a}+\text{b})$ $\frac{11}{5}\text{a} - \frac{2}{5}\text{b}$			
	(ii)	$CD = \frac{2}{3}BC$ $\lvert\overrightarrow{CD}\rvert = \frac{2}{3}\lvert\overrightarrow{BC}\rvert$ B, C and D lie on a straight line.			
	(iii)	The two triangles are similar.			

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	(iv)	$\frac{\frac{1}{2}\times BC\times h}{\frac{1}{2}\times CD\times h}=\frac{3}{2}$			
7	**(a)(i)**	$\frac{1}{x}$			
	(ii)	$\frac{1}{x-4}$			
	(b)	$\frac{6}{x}+\frac{6}{x-4}=1$ $\frac{2x-4}{x(x-4)}=\frac{1}{6}$ $x^2-4x=12x-24$ $x^2-16x+24=0$			
	(c)(i)	$x=\frac{16\pm\sqrt{16^2-4(24)}}{2}$ $=\frac{16\pm\sqrt{160}}{2}$ x = 14.32 or x = 1.68			
	(ii)	x = 1.68 will make time taken to be negative for Tap B			
	(d)	$14.32-4=10.324h$ $=10\text{h}19\,\text{mins}$			
8	**(a)**	$\angle a=360°-260°=100°$ $\angle b=80°$(co-interior angles, parallel north lines) $\angle ABC=210°-80°=130°$			
	(b)(i)	$AC=\sqrt{75^2+110^2-2(75)(110)\cos 130°}$ $=168.318$ $=168\text{m}$			
	(ii)	$\frac{\sin a}{110}=\frac{\sin 130°}{168.318}$ $\angle a=30.0°$ $30°+30°=060.0°$			
	(c)	$d=75\sin 30.04°$ $=37.545\text{m}$ $\tan\theta=\frac{55}{37.545}$ $\theta=55.7°$			

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9	**(a)**	Moon Hub 42.90+(16.05x30)+(10.70x2) $(42.90+4.815+21.4)=$69.12 SingCom 56.61+(8.60x2) $(56.61+17.20)=$73.81 Hence Owen should use Moon Hub as it cost less at $69.12.			
	(b)	SingCom $(73.81+56.61+38.89) $(73.81+56.61+38.89)x0.85 =$143.91 MoonHub $(69.12+42.90+39.90) =$151.92 Since SingCom cost < MoonHub cost, choose Singcom.			

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