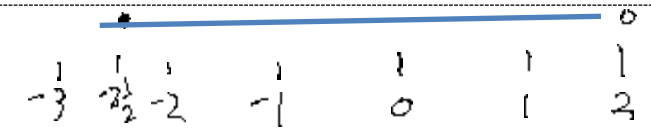
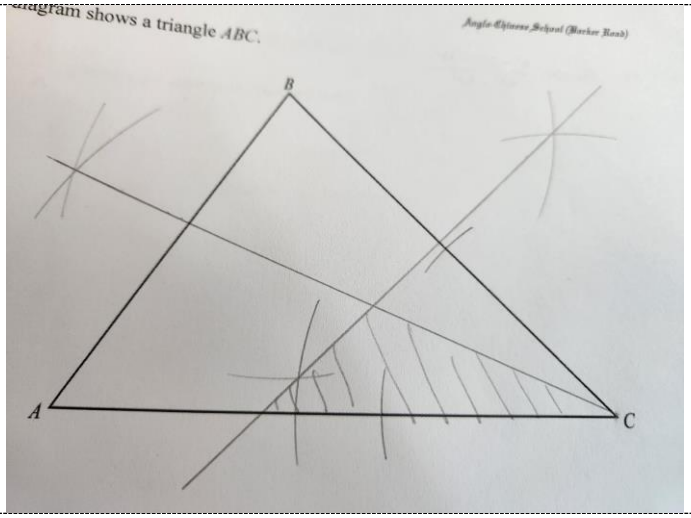
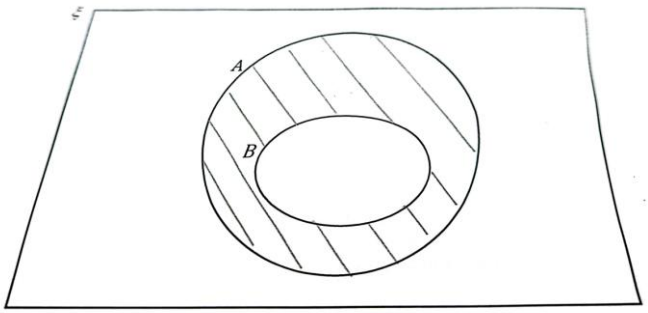
Marking Scheme
Secondary 4 Exp
Mathematics 4052/1

Anglo-Chinese School
(Barker Road)

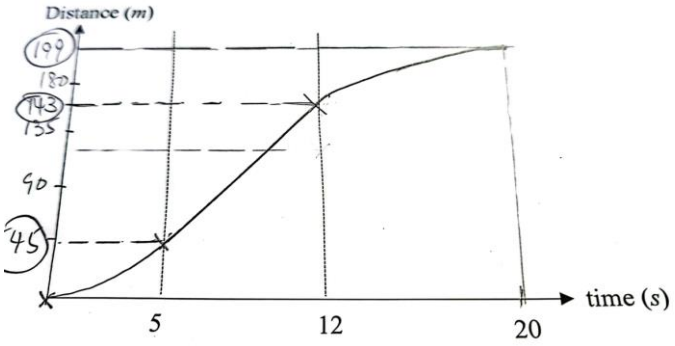
1		$2a+6$			
2	**(a)**	51.910			
	(b)	52			
3		$39.9°, 140.1°$			
4	**(a)**	$2^3 \times 3 \times 7$			
	(b)	42			
5	**(a)**	$3y(x-2a)-5(x-2a)$ $=(3y-5)(x-2a)$			
	(b)	$x=-\frac{1}{2}$ or $x=3$			
	(c)(i)	$9x-1<11+3x$ $9x-3x<12$ $6x<12$ $x<2$ $11+3x \le 7x+21$ $3x-7x \le 21-11$ $-4x \le 10$ $x \ge -2\frac{1}{2}$ $-2\frac{1}{2} \le x < 2$			
	(ii)				
6	**(a)**	$60 = 2^2 \times 3 \times 5$ $72 = 2^3 \times 3^2$ $84 = 2^2 \times 3 \times 7$ HCF$= 2^2 \times 3$ $=12$			

	(b)	$R=\frac{60}{12}=5$ $Y=\frac{72}{12}=6$ $B=\frac{84}{12}=7$			
7	**(a)**	$(x-4)^2-16+18$ $=(x-4)^2+2$			
	(b)	$x = 4$			
	(c)	Since the minimum value =2 which is above the x axis, the graph will not pass through the x-axis.			
8	**(a)**	$AB=\sqrt{20.5^2-13.3^2}$ $=15.6\text{cm}$			
	(b)(i)	Angle $ABC = 90^0$. Since angle in a semi-circle is 90^0, it is possible to draw a circle through A, B and C with AC as the diameter.			
	(ii)	Radius = 10.25cm			
9	**(a)**	Evidence of construction marks for angle bisector at angle C.			
	(b)	Evidence of construction marks for perpendicular bisector of BC.			
	(c)				

10		$\frac{29}{37}x-15=4\left(\frac{8}{37}x-15\right)$ $x=555$ $\frac{29}{37}\times 555=435$ $435-15=420$ Alternatively 4:1=28:7 $1u---\$15$ $29\times 15=435$ $435-15=420$			
11		$\frac{(a+b)(a-3b)}{4(b-a)(b+a)}$ $=\frac{a-3b}{4(b-a)}$			
12		$\frac{5}{3(x-1)}+\frac{3}{2(1-x)}+4=0$ $\frac{5}{3(x-1)}-\frac{3}{2(x-1)}+4=0$ $\frac{10-9}{6(x-1)}=-4$ $x=\frac{23}{24}$			
13	**(a)**	8×10^4			
	(b)	400			
14	**(a)**	$\begin{pmatrix}25 & 15\\ 10 & 30\end{pmatrix}$			
	(b)	$5C=\begin{pmatrix}50 & 150\\ 100 & 50\end{pmatrix}$ $E=\begin{pmatrix}75 & 165\\ 110 & 80\end{pmatrix}$			

	(c)	E represents the number of **adults and children** ferried in **the morning and afternoon** from **Monday to Saturday.**			
	d(i)	$F=\begin{pmatrix}7000\\6500\end{pmatrix}$			
	(ii)	F represents the amount of money collected in **cents** on a **weekday morning and afternoon**.			
15	**(a)**				
	(b)(i)	4,16,36			
	(ii)	3			
16		Grad of *XY* is undefined and so the line is parallel to y-axis. $x = 1$			
17	**(a)(i)**	x^4			
	(b)(i)	$3^{-4} = 3^k$ $k = -4$			
	(ii)	$5^{4p-q} = 5^{3r}$ $4p - q = 3r$ $q = 4p - 3r$			
18		In triangle *BOC* and *EOF*, ● Angle *BOC* = angle *EOF* = 60^0 (angle at the point, *ABCD* is a regular hexagon) ● *BC=EF* (*ABCD* is a regular hexagon, all sides equal) ● Angle *BCO* = angle *EFO* = 60^0 (equilateral triangle) ● By ASA congruency test, triangle *BOC* is congruent to triangle *EOF*.			

19	**(a)(i)**	$(1+x)(1+x+x+x^2)$ $=(1+x)(1+x)^2$ $=(1+x)^3$			
	(ii)	$n = 5$			
	(b)	$2[(1+x)^{100}]$ $=2(4)^{100}$ $=2(2^{200})$ $=2^{201}$			
20		Angle $OBD = 90^0 - x$ (angle between the tangent and radius of a circle is a right angle). Angle $BOD = 180^0 - 2(90^0 - x) = 2x$ (base angles of an isosceles triangle, $OB = OD$, radii of the circle) Angle $BCD = \frac{360^0 - 2x}{2}$ (angle at the centre is twice the angle at the circumference) $=180^0 - x$			
21	**(a)(i)**	61.85			
	(b)(i)	$\frac{4}{5}$			
	(b)(ii)	$\left(\frac{4}{5}\right)\left(\frac{1}{5}\right)+\left(\frac{1}{5}\right)\left(\frac{4}{5}\right)$ $=\frac{8}{25}$			
	(c)	There is **improvement** in the performance of students as **the mean mark** of the students in the final year examination **63.7 marks** is **higher than** the mean mark of the mid-year examination of **61.85** marks. **More students passed** the final year examination.			
22	**(a)(i)**	$\frac{V_K}{V_J}=\left(\frac{9}{5}\right)^3=729:125$			
	(ii)	$\frac{S_J}{S_K}=\left(\frac{5}{9}\right)^2=25:81$			
	(b)	$K=\frac{729}{125}\times 250$ $=1.458\text{kg}$			

23	**(a)**	1			
	(b)	6			
	(c)	3			
24	**(a)(i)**	2 m/s^2			
	(ii)	$\frac{7}{4}\times 6 = 10.5$ m/s			
	(iii)	45+98+24.5 = 167.5 m			
	(b)				
25		Area of ½ square =1 cm^2 Area of sector $\frac{1}{2}\times\sqrt{2}\times\sqrt{2}=1$ $\frac{45}{360}\times\pi\times\left(\sqrt{2}\right)^2$ $=\frac{\pi}{4}$ Area of shaded region= $1-\frac{\pi}{4}$ cm^2			