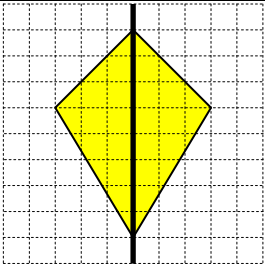**Education and Manpower Bureau**
Territory-wide System Assessment 2006
Secondary 3 Mathematics
Marking Scheme

Question No.	Answers	Marks	Remarks
1	A	1	
2	D	1	
3	C	1	
4	B	1	
5	B	1	
6	D	1	
7	C	1	
8	B	1	
9	B	1	
10	C	1	
11	A	1	
12	D	1	
13	A	1	
14	B	1	
15	C	1	
16	B	1	
17	C	1	
18	D	1	
19	C	1	
20	C	1	
21	B	1	
22	1 200	1	
23	$\underline{5} : \underline{3}$	1	Must be all correct
24	$4n$	1	
25	-2	1	
26	$-6x + 3x2 - 12x3$	1	Accept $-12x3 + 3x2 - 6x$, etc.
27	$(x - 3)2$	1	Accept $(x - 3)(x - 3)$, etc.
28	$5(x + 1) = 90$	1	Accept $5x + 5 = 90$, etc.

Question No.	Answers	Marks	Remarks
29	$\dfrac{1}{2}$ or 0.5	1	
30	$x + y = 20$ $2x + 3y = 47$	1 1	Order of arrangement is not important. 1 mark for each correct equation. Accept other equivalent equations e.g.: $x = 20 - y$
31	$9x^2 - 24xy + 16y^2$	1	Accept $9x^2 + 16y^2 - 24xy$, etc.
32	$x \le -5$	1	
33	768	1	
34		1	
35	$x = \underline{45}$，$a = \underline{7}$	1	Must be all correct
36	*BDEG* / *DEGB* / *EGBD* / *GBDE* / *BGED* / *GEDB* / *EDBG* / *DBGE*	1	
37	$\angle FAB$ / $\angle BAF$ or $\angle EDC$ / $\angle CDE$	1	
38	18	1	
39	60°	1	
40	(i) Discrete (ii) Continuous	1	Must be all correct
41	$31 - 35$	1	
42	79	1	
43	$\dfrac{4}{25}$ or 0.16	1	
44	Total number of visitors $\approx 20\,000 \times 5$ $= 100\,000$ OR $\because$ The number of visitors each month is close to $20\,000$. $\therefore$ The total number of visitors is about $20\,000 \times 5 = 100\,000$.	1 1	Other reasonable methods of estimation are also acceptable 1 mark for the estimated value

Question No.	Answers	Marks	Remarks
45	$\begin{cases} x+y=1 & \cdots(1) \\ \quad x=2y+4 & \cdots(2) \end{cases}$ Sub (2) into (1), $\quad (2y+4)+y=1$ $\qquad\qquad y=-1$ Sub $y=-1$ into (2), $\quad x=2(-1)+4$ $\qquad =2$ $\therefore\; x=2$ and $y=-1$ OR $\begin{cases} x+y=1 & \cdots(1) \\ \quad x=2y+4 & \cdots(2) \end{cases}$ From (2), $\; x-2y=4 \quad\cdots(3)$ $(1)-(3)$ $\qquad 3y=-3$ $\qquad\; y=-1$ Sub $y=-1$ into (1), $\quad x=2(-1)+4$ $\qquad =2$ $\therefore\; x=2$ and $y=-1$	1 1* 1*	Accept other methods of substitution Answer mark (*please see remarks below) Answer mark (*please see remarks below) Accept other methods by eliminating either x or y from the pair of simultaneous equations
46	The amount that David will receive $= \$2\,000 \times (1+10\%)^3$ $= \$2\,662$	1 1* 1**	Method mark: other correct methods are also acceptable Answer mark (*please see remarks below) Presentation mark (** please see remarks below)
47(a)	$E=250+120n$ $120n=E-250$ $\quad n=\dfrac{E-250}{120}$	1	1 mark for expressing n as the subject of the formula
47(b)	$n=\dfrac{1090-250}{120}$ $n=7$ OR $1090=250+120n$ $\quad n=7$	1 1*	1 mark for substituting the value of E into the formula obtained in (a) Answer mark (*please see remarks below)

Question No.	Answers	Marks	Remarks
48	The height of the street lamp is about 4 m.	1	Acceptable range: $3.5 \text{ m} \leq h < 4.5 \text{ m}$
	The street lamp is about 4 times as tall as the little girl.	1	Other reasonable methods of estimation are also acceptable e.g. The height of the girl is about 1 m. Height of street lamp $\approx 4 \times 1 \text{ m}$ $= 4 \text{ m}$
49	Circumference of the base of the cone $= 2\pi \times 20 \times \dfrac{108}{360}$ cm	1	1 mark for formula
	$= 37.7$ cm	1*	Answer mark (*please see remarks below)
		1**	Presentation mark (** please see remarks below)
50	$\angle ABC = \dfrac{180° - 30° - 56°}{2}$ $\qquad = 47°$	1	1 mark for $\angle ABC$
	$\angle ADC = 30° + 47°$	1	Method mark: other correct methods are also acceptable
	$\qquad = 77°$ OR $\angle ACB = \dfrac{180° - 30° - 56°}{2}$ $\qquad = 47°$ $\angle ADC = 180° - 56° - 47°$ $\qquad = 77°$	1*	Answer mark (*please see remarks below)
51	$\angle AEB + \angle BEC + \angle CED = 180°$ (adj. $\angle$s on st. line)	1	Deduct 1 mark for missing/ wrong reasons
	$20° + \angle BEC + 70° = 180°$ $\qquad\qquad \angle BEC = 90°$ $\therefore \quad BE \perp CE$	1 1	1 mark for $\angle BEC = 90°$ Award mark only when a correct proof is given
	OR $\angle AEB + \angle BEC + \angle CED + \angle DEA = 360°$ ($\angle$s at a pt.) $20° + \angle BEC + 70° + 180° = 360°$ $\qquad\qquad\qquad \angle BEC = 90°$ $\therefore \quad BE \perp CE$		Other correct proofs are also acceptable

Question No.	Answers	Marks	Remarks
52(a)	<table><thead><tr><th>Height less than (cm)</th><th>Cumulative frequency</th></tr></thead><tbody><tr><td>155.5</td><td>0</td></tr><tr><td>160.5</td><td>5</td></tr><tr><td>165.5</td><td>17</td></tr><tr><td>170.5</td><td>31</td></tr><tr><td>175.5</td><td>37</td></tr><tr><td>180.5</td><td>40</td></tr></tbody></table>	1	Must be all correct
52(b)	**The heights of 40 students** 	1 1 1	Correct scale of height: 175.5, 180.5 respectively Cumulative frequency polygon drawn from the cumulative frequency table in part (a) Correct graph (Do not accept cumulative frequency curve)

Remarks: *Answer mark - (1) Just the correct answer without showing mathematical expression, award the answer mark.

          (2) Mathematical expression is incorrect, do not award the answer mark.

          (3) Poor presentation in the mathematical expression or workings but correct answer given, award the answer mark.

  **Presentation mark: (1) Mathematical expression is correct, but wrong answer given, award the presentation mark.

          (2) Mathematical expression is incorrect, do not award the presentation mark.

          (3) Presentation mark includes holistic assessment of mathematical expression, units (missing unit or wrong unit), explanation, statement/conclusion and use of symbols, etc.