o.	Solution	Marks Remarks
1	(a) 3	B1
	(b) $a=\sqrt{\frac{2b+c}{b-4}}$	
	$a^2=\frac{2b+c}{b-4}$	
	$a^2(b-4)=2b+c$	M1
	$a^2b-2b=4a^2+c$	
	$b(a^2-2)=4a^2+c$	M1
	$b=\frac{4a^2+c}{a^2-2}$	A1
2	(a) $\frac{12ab^3}{3c^2}\div\frac{18a^2}{6bc}$	
	$=\frac{12ab^3}{3c^2}\times\frac{6bc}{18a^2}$	M1 for changing divide to times correctly
	$=\frac{4b^4}{3ac}$	A1
	(b) $\frac{5}{3x-2}-\frac{4}{x+1}$	
	$=\frac{5(x+1)}{(3x-2)(x+1)}-\frac{4(3x-2)}{(3x-2)(x+1)}$	M1 for changing common denominator
	$-\frac{5(x+1)-4(3x-2)}{(3x-2)(x+1)}$	
	$=\frac{13-7x}{(3x-2)(x+1)}$	A1

3	(a) Increase in population $=907300\quad 834096$ $=73204$	M1
	Increase $=\frac{73204}{834096}\times100$ $=8.7764$ ≈8.78	A1
	(b) Original amount of sugar $=\frac{25}{100}\times60=15g$	M1
	et x be the amount of sugar to be added $\frac{15+x}{60+x}=\frac{40}{100}$ $x=15$	A1
4	$\angle BCF=\frac{(6-2)\times180°}{6}$ $=120°$	M1
	Exterior angle of n-sided polygon $=120°+90°-180°$ $=30°$	M1. Accept if student find interior angle (150°).
	$n=\frac{360°}{30°}$ $=12$	M1. Accept if use $\frac{(n\quad 2)180°}{n}=150°$. A1
5	(a) $x+y=12$	B1
	(b) $0.2x+0.5y=4.5$ $2x+5y=45$	B1
	(c) $x+y=12$ ----- (1) $2x+5y=45$ ---- (2)	
	(2) – 2 (1) $3y=21$ $y=7$	M1 for attempting substitution or elimination
	sub $y=7$ into (1), $x=5$	
	$\therefore x=5,\ y=7$	A1, A1 for correct values of x and y

6	(a) $AD^2 + BD^2 = 9^2 + 12^2$ $= 225$ $AB^2 = 15^2 = 225$ Since $AD^2 + BD^2 = AB^2$, by converse of Pythagoras' Theorem, triangle ABD is a right-angled triangle.	M1 A1
	(b) Area of triangle $BCD = \frac{1}{2}(5)(12)$ $= 30\text{cm}^2$	M1 A1
	(c) $CD = \sqrt{12^2 + 5^2} = 13\text{cm}$ Shortest distance of B to $CD = 30 \div \frac{1}{2}(13)$ $= 4.61538$ $\approx 4.62\text{cm}$	M1 M1 A1
7	(a) $\frac{150}{x}$ h	B1
	(b) $\frac{150}{x+10}$ h	B1
	(c) $\frac{150}{x} - \frac{150}{x+10} = \frac{1}{2}$ $150(x+10)(2) - 150(x)(2) = 1(x)(x+10)$ $300x + 3000 - 300x = x^2 + 10x$ $x^2 + 10x - 3000 = 0$ (shown)	M1 A1
	(d) $x^2 + 10x - 3000 = 0$ $(x+60)(x-50) = 0$ $x = -60$ or 50	M1 A1, A1
	(e) Time taken by ucien $= \frac{150}{50+10}$ $= 2.5$ h	M1 A1

8	(a) 17	B1
	(b) 25	B1
	(c) o. of students who passed $= \frac{40}{100} \times 15 = 6$ Minimum passing mark = 23	M1 A1
	(d) 19	B1
9	(a) Cost of talk time exceeded $= 72 \times 16.05$ cents $= 1155.6$ cents $= 11.556$ Cost of excess data $= 18 \times 10.70$ $= 192.60$ Use 188 Total excess charges $= 11.556 + 188$ $= 199.556$ ≈ 200	M1 M1 A1
	(b) Cost of Plan B for 2 years $= 98 \times 24$ months $+ 485 + 5.40 \times 24$ months $= 2966.60$ Cost of Plan D for 2 years $= 40.65 \times 24$ months $+ 1836 + 5.40 \times 24$ months $+ 5.08 \times 24$ months $= 3063.12$ Jane should sign up for Plan **B**.	M1 award if 2out of 3 are correct M1 for 2966.60 M1 award if 2out of 4 are correct M1 for 3063.12 A1