Paper 1

Solution	Marks	Remarks
1. $\frac{x^{20}y^{13}}{(x^5y)^6}$		
$=\frac{x^{20}y^{13}}{x^{30}y^6}$	1M	for $(ab)^m = a^m b^m$ or $(a^m)^n = a^{mn}$
$=\frac{y^{13-6}}{x^{30-20}}$	1M	for $\frac{c^p}{c^q} = c^{p-q}$ or $\frac{c^p}{c^q} = \frac{1}{c^{q-p}}$
$=\frac{y^7}{x^{10}}$	1A	
	----------(3)	
2. $\frac{3}{h} - \frac{1}{k} = 2$		
$\frac{1}{k} = \frac{3}{h} - 2$	1M	for putting k on one side
$\frac{1}{k} = \frac{3-2h}{h}$	1M	
$k = \frac{h}{3-2h}$	1A	or equivalent
$\frac{3}{h} - \frac{1}{k} = 2$		
$\left(\frac{3}{h} - \frac{1}{k}\right)hk = 2hk$	1M	
$3k - h = 2hk$		
$3k - 2hk = h$	1M	for putting k on one side
$k(3-2h) = h$		
$k = \frac{h}{3-2h}$	1A	or equivalent
$\frac{3}{h} - \frac{1}{k} = 2$		
$\frac{3k-h}{hk} = 2$	1M	
$3k - h = 2hk$		
$3k - 2hk = h$	1M	for putting k on one side
$k(3-2h) = h$		
$k = \frac{h}{3-2h}$	1A	or equivalent
	----------(3)	
3. (a) $4m^2 - 25n^2$		
$= (2m)^2 - (5n)^2$		
$= (2m \quad 5n)(2m+5n)$	1A	or equivalent
(b) $4m^2 - 25n^2 + 6m - 15n$		
$= (2m-5n)(2m+5n) + 6m - 15n$	1M	for using the result of (a)
$= (2m-5n)(2m+5n) + 3(2m-5n)$		
$= (2m-5n)(2m+5n+3)$	1A	or equivalent
	----------(3)	

Solution	Marks	Remarks
4. Let $\$x$ be the price of a pear and $\$y$ be the price of an orange.		
$\begin{cases} 7x+3y=47 \\ 5x+6y=49 \end{cases}$	1A+1A	
So, we have $2(7x)-5x=2(47)-49$.	1M	for getting a linear equation in x or y only
Solving, we have $x=5$.	1A	
Thus, the price of a pear is $\$5$.		
Let $\$x$ be the price of a pear.		
$5x+6\left(\frac{47-7x}{3}\right)=49$	1M+1A+1A	1A for $y=\frac{47-7x}{3}$ + 1M for $5x+6y$
Solving, we have $x=5$.	1A	
Thus, the price of a pear is $\$5$.		
The price of a pear $=\frac{2(47)-49}{2(7)-5}$	1M+1A+1A	1M for fraction + 1A for numerator + 1A for denominator
$=\$5$	1A	
	----------(4)	
5. (a) $\frac{19-7x}{3}>23-5x$		
$19-7x>69-15x$		
$-7x+15x>69-19$	1M	for putting x on one side
$8x>50$		
$x>\frac{25}{4}$	1A	$x>6.25$
(b) $18-2x\geq 0$		
$x\leq 9$	1A	
By (a), we have $\frac{25}{4}<x\leq 9$.		
Thus, the required integers are 7 , 8 and 9 .	1A	for all correct
	----------(4)	

Solution	Marks	Remarks
6. (a) L is the angle bisector of $\angle AOB$.	1M	
(b) Let $S(r\,,\theta)$ be the point of intersection of L and AB .		
r		
$= 26\cos 60°$	1M	
$= 13$	1A	
θ		
$= 70°$	1A	
Thus, the required polar coordinates are $(13\,,70°)$.		
	----------(4)	
7. (a) In ΔABC and ΔDCB ,		
$\angle BCE = \angle CBE$ (base $\angle$s, isos. Δ)		
$\angle BAC = \angle BDC$ (given)		
$BC = BC$ (common side)		
$\Delta ABC \cong \Delta DCB$ (AAS)		
Marking Scheme:		
Case 1 Any correct proof with correct reasons.	2	
Case 2 Any correct proof without reasons.	1	
(b) (i) There are 3 pairs of congruent triangles.	1A	
(ii) There are 4 pairs of similar triangles.	1A	
	----------(4)	

Solution	Marks	Remarks
8. (a) The maximum absolute error		
$= 0.5$ g		
The least possible weight		
$= 100 - 0.5$	1M	
$= 99.5$ g	1A	
(b) The least possible total weight of 32 *regular* packs of sea salt		
$= (99.5)(32)$	1M	
$= 3\,184$ g	1A	
$= 3.184$ kg		
$= 3.2$ kg (correct to the nearest 0.1 kg)		
Thus, it is impossible that the total weight of 32 *regular* packs of sea salt is measured as 3.1 kg correct to the nearest 0.1 kg .	1A	f.t.
Note that		
$\frac{3.15}{32}$ kg	1M	
$= 0.0984375$ kg		
$= 98.4375$ g	1A	
< 99.5 g		
Thus, it is impossible that the total weight of 32 *regular* packs of sea salt is measured as 3.1 kg correct to the nearest 0.1 kg .	1A	f.t.
	----------(5)	
9. (a) The mean		
$= \frac{7}{2}$	1A	3.5
The inter-quartile range		
$= 4 - 2$	1M	
$= 2$	1A	
The standard deviation		
$= 1.5$	1A	
(b) The new standard deviation		
≈ 1.451456116		
The decrease in the standard deviation		
$\approx 1.5 - 1.451456116$		
$= 0.048543884$		
≈ 0.0485	1A	r.t. 0.0485
	----------(5)	

Solution	Marks	Remarks
10. (a) The median		
$= 31$	1A	
The mode		
$= 23$	1A	
	----------(2)	
(b) (i) Note that $0 \le a \le 5$ and $7 \le b \le 9$.		
Also note that the range of the distribution is 47 .		
Thus, we have $\begin{cases} a=0 \\ b=7 \end{cases}$, $\begin{cases} a=1 \\ b=8 \end{cases}$ or $\begin{cases} a=2 \\ b=9 \end{cases}$.	1A+1A	1A for one pair + 1A for all
(ii) The required probability		
$= \dfrac{3+3+3+3+2+9+9}{260}$	1M	
$= \dfrac{32}{260}$		
$= \dfrac{8}{65}$	1A	r.t. 0.123
The required probability		
$= \dfrac{3+3+2+2+2+2+2+2+2+4+4+4}{260}$	1M	
$= \dfrac{32}{260}$		
$= \dfrac{8}{65}$	1A	r.t. 0.123
	----------(4)	
11. (a) Let $W = h\ell + k\ell^2$, where h and k are non-zero constants.	1A	
$\begin{cases} h(1)+k(1^2)=181 \\ h(2)+k(2^2)=402 \end{cases}$	1M	for substitution
Solving, we have $h=161$ and $k=20$.	1A	for both correct
The required weight		
$= 161(1.2)+20(1.2^2)$		
$= 222$ grams	1A	
	----------(4)	
(b) $20\ell^2 + 161\ell = 594$		
$20\ell^2 + 161\ell - 594 = 0$	1M	
$(4\ell - 11)(5\ell + 54) = 0$		
$\ell = \dfrac{11}{4}$ or $\ell = \dfrac{-54}{5}$ (rejected)	1A	2.75
Thus, the perimeter of the tray is $\dfrac{11}{4}$ metres.		
	----------(2)	

Solution	Marks	Remarks
12. (a) By comparing the coefficients of x^3 and the constant terms, we have $a=3$ and $c=4$.	1A+1A	
Note that the coefficient of x^2 in the expansion of $(x-2)(3x^2+bx+4)$ is $b-6$.		
By comparing the coefficients of x^2 , we have $b-6=-7$.	1M	
Thus, we have $b=-1$.	1A	
Note that $x-2$ is a factor of $f(x)$.		
$f(2)=0$		
$3(2)^3-7(2)^2+2k-8=0$	1M	
$k=6$		
$f(x)$		
$=3x^3-7x^2+6x-8$		
$=(x-2)(3x^2-x+4)$		
Thus, we have $a=3$, $b=-1$ and $c=4$.	1A+1A+1A	
	----------(4)	
(b) Δ		
$=(-1)^2-4(3)(4)$	1M	
$=-47$		
<0		
So, the equation $3x^2-x+4=0$ has nonreal roots.		
Thus, the claim is disagreed.	1M+1A	f.t.
	----------(3)	

Solution	Marks	Remarks
13. (a) (i) $\dfrac{\pi r^2}{\pi R^2}=\dfrac{1}{9}$	1M	
$\left(\dfrac{r}{R}\right)^2=\dfrac{1}{9}$		
$\dfrac{r}{R}=\dfrac{1}{3}$		
$r:R=1:3$	1A	
(ii) Let h cm be the height of a larger circular cylinder.		
$2\pi R^2h=27(\pi r^2(10))$	1M	
$h=\dfrac{270}{2}\left(\dfrac{r}{R}\right)^2$		
$h=\dfrac{270}{2}\left(\dfrac{1}{3}\right)^2$	1M	
$h=15$	1A	
Thus, the height of a larger circular cylinder is 15 cm .		
	----------(5)	
(b) $\dfrac{\text{The base radius of a smaller circular cylinder}}{\text{The base radius of a larger circular cylinder}}=\dfrac{1}{3}$		
$\dfrac{\text{The height of a smaller circular cylinder}}{\text{The height of a larger circular cylinder}}=\dfrac{10}{15}=\dfrac{2}{3}$		
$\dfrac{\text{The base radius of a smaller circular cylinder}}{\text{The base radius of a larger circular cylinder}}\neq\dfrac{\text{The height of a smaller circular cylinder}}{\text{The height of a larger circular cylinder}}$	1M	for comparing two ratios
Therefore, the two circular cylinders are not similar.		
Thus, the claim is disagreed.	1A	f.t.
$\dfrac{\text{The base area of a smaller circular cylinder}}{\text{The base area of a larger circular cylinder}}=\dfrac{1}{9}$		
$\dfrac{\text{The curved surface area of a smaller circular cylinder}}{\text{The curved surface area of a larger circular cylinder}}=\dfrac{2\pi r(10)}{2\pi R(15)}=\dfrac{2}{9}$		
$\dfrac{\text{The base area of a smaller circular cylinder}}{\text{The base area of a larger circular cylinder}}\neq\dfrac{\text{The curved surface area of a smaller circular cylinder}}{\text{The curved surface area of a larger circular cylinder}}$	1M	for comparing two ratios
Therefore, the two circular cylinders are not similar.		
Thus, the claim is disagreed.	1A	f.t.
$\dfrac{\text{The base radius of a smaller circular cylinder}}{\text{The base radius of a larger circular cylinder}}=\dfrac{1}{3}$		
$\left(\dfrac{\text{The base radius of a smaller circular cylinder}}{\text{The base radius of a larger circular cylinder}}\right)^3=\left(\dfrac{1}{3}\right)^3=\dfrac{1}{27}$		
$\dfrac{\text{The volume of a smaller circular cylinder}}{\text{The volume of a larger circular cylinder}}=\dfrac{2}{27}$		
$\dfrac{\text{The volume of a smaller circular cylinder}}{\text{The volume of a larger circular cylinder}}\neq\left(\dfrac{\text{The base radius of a smaller circular cylinder}}{\text{The base radius of a larger circular cylinder}}\right)^3$	1M	for comparing two ratios
Therefore, the two circular cylinders are not similar.		
Thus, the claim is disagreed.	1A	f.t.
	----------(2)	

Solution	Marks	Remarks
14. (a) The coordinates of R		
$= (6, 17)$	1A	
	----------(1)	
(b) (i) Let (h, k) be the coordinates of P.		
Since P lies on L, we have $4h + 3k + 50 = 0$.	1M	
Note that RP is perpendicular to the straight line $4x + 3y + 50 = 0$.		
Also note that the slope of RP is $\frac{k-17}{h-6}$.		
Hence, we have $\left(\frac{k-17}{h-6}\right)\left(\frac{-4}{3}\right) = -1$.	1M	
So, we have $3h - 4k + 50 = 0$.		
Solving, we have $h = -14$ and $k = 2$.		
Therefore, the coordinates of P are $(-14, 2)$.		
The distance between P and R		
$= \sqrt{(-14-6)^2 + (2-17)^2}$	1M	
$= 25$	1A	
(ii) (1) P, Q and R are collinear.	1M	
(2) Note that the radius of the C is 10 .		
The distance between Q and R		
$= 10$	1M	
The distance between P and Q		
$= 25 - 10$		
$= 15$	1M	
The required ratio		
$= PQ : QR$		
$= 15 : 10$		
$= 3 : 2$	1A	
	----------(8)	

Solution	Marks	Remarks
15. (a) Note that the highest score of the distribution is 90 marks. Let μ marks and σ marks be the mean and the standard deviation of the distribution respectively. $\begin{cases} 90-\mu=3\sigma \\ 65-\mu=0.5\sigma \end{cases}$	1M	
Solving, we have $\mu=60$.	1A	
Thus, the mean of the distribution is 60 marks.		
Note that the highest score of the distribution is 90 marks. Let σ marks be the standard deviation of the distribution. $3-0.5=\dfrac{90-65}{\sigma}$	1M	for both
$\sigma=10$ The mean $=90-3\sigma$ $=90-3(10)$		
$=60$ marks	1A	
Note that the highest score of the distribution is 90 marks. The mean $=90-3\left(\dfrac{90-65}{3-0.5}\right)$	1M	
$=60$ marks	1A	
Note that the highest score of the distribution is 90 marks. The mean $=65-0.5\left(\dfrac{90-65}{3-0.5}\right)$	1M	
$=60$ marks	1A	
	----------(2)	
(b) Note that if the test score of a student is lower than the mean, then the standard score of the student is negative. Also note that the median is 55 marks and the mean is 60 marks. So, the median is less than the mean.	1M	either one
Therefore, the test scores of at least half of the students are less than the mean. Thus, the claim is agreed.	1A	f.t.
	----------(2)	

	Solution	Marks	Remarks
16. (a)	The required probability		
	$=\frac{C_4^5C_2^{11}+C_5^5C_1^{11}}{C_6^{16}}$	1M	for numerator
	$=\frac{286}{8008}$		
	$=\frac{1}{28}$	1A	r.t. 0.0357
	The required probability		
	$=15\left(\frac{5}{16}\right)\left(\frac{4}{15}\right)\left(\frac{3}{14}\right)\left(\frac{2}{13}\right)\left(\frac{11}{12}\right)\left(\frac{10}{11}\right)+6\left(\frac{5}{16}\right)\left(\frac{4}{15}\right)\left(\frac{3}{14}\right)\left(\frac{2}{13}\right)\left(\frac{1}{12}\right)\left(\frac{11}{11}\right)$	1M	for $15p_1+6p_2$
	$=\frac{1}{28}$	1A	r.t. 0.0357
		----------(2)	
(b)	The required probability		
	$=1-\frac{1}{28}$	1M	for $1-(a)$
	$=\frac{27}{28}$	1A	r.t. 0.964
	The required probability		
	$=\frac{C_0^5C_6^{11}+C_1^5C_5^{11}+C_2^5C_4^{11}+C_3^5C_3^{11}}{C_6^{16}}$	1M	for considering 4 cases
	$=\frac{7722}{8008}$		
	$=\frac{27}{28}$	1A	r.t. 0.964
	The required probability		
	$=\left(\frac{11}{16}\right)\left(\frac{10}{15}\right)\left(\frac{9}{14}\right)\left(\frac{8}{13}\right)\left(\frac{7}{12}\right)\left(\frac{6}{11}\right)+6\left(\frac{5}{16}\right)\left(\frac{11}{15}\right)\left(\frac{10}{14}\right)\left(\frac{9}{13}\right)\left(\frac{8}{12}\right)\left(\frac{7}{11}\right)$ $+15\left(\frac{5}{16}\right)\left(\frac{4}{15}\right)\left(\frac{11}{14}\right)\left(\frac{10}{13}\right)\left(\frac{9}{12}\right)\left(\frac{8}{11}\right)+20\left(\frac{5}{16}\right)\left(\frac{4}{15}\right)\left(\frac{3}{14}\right)\left(\frac{11}{13}\right)\left(\frac{10}{12}\right)\left(\frac{9}{11}\right)$	1M	for $p_3+6p_4+15p_5+20p_6$
	$=\frac{27}{28}$	1A	r.t. 0.964
		----------(2)	

Solution	Marks	Remarks
17. (a) $f(x)$		
$= 36x - x^2$		
$= -(x^2 - 36x + 18^2) + 18^2$	1M	
$= -(x-18)^2 + 324$		
Thus, the coordinates of the vertex are $(18, 324)$.	1A	
	----------(2)	
(b) (i) A		
$= x\left(\dfrac{108-3x}{2}\right)$	1M+1A	1M for $x\left(\dfrac{108-mx}{2}\right)$, $m > 0$
$= 54x - \dfrac{3}{2}x^2$		
(ii) Note that $A = \dfrac{3}{2}f(x)$, where $f(x) = 36x - x^2$ and $0 < x < 36$.		
By (a), the greatest value of A is 486 .	1M	
Thus, the claim is disagreed.	1A	f.t.
Assume that $A > 500$.		
Hence, we have $54x - \dfrac{3}{2}x^2 > 500$.		
So, we have $3x^2 - 108x + 1000 < 0$.		
Δ		
$= (-108)^2 - 4(3)(1000)$		
$= -336$		
< 0	1M	
Therefore, we have $3x^2 - 108x + 1000 > 0$.		
This is impossible.		
Thus, the claim is disagreed.	1A	f.t.
Note that $A = 54x - \dfrac{3}{2}x^2$.		
Hence, the quadratic equation $3x^2 - 108x + 2A = 0$ has real roots.		
So, we have $(-108)^2 - 4(3)(2A) \geq 0$.	1M	
Therefore, we have $11\,664 - 24A \geq 0$.		
Solving, we have $A \leq 486$.		
Thus, the claim is disagreed.	1A	f.t.
	----------(4)	

Solution	Marks	Remarks
18. (a) (i) Note that $\angle ABC = 90°$.		
$\tan\angle BCM = \dfrac{28}{21}$		
$\angle BCM \approx 53.13010235°$		
$\angle BCM \approx 53.1°$	1A	r.t. $53.1°$
(ii) By sine formula,		
$\dfrac{CM}{\sin\angle MBC} = \dfrac{BC}{\sin\angle BMC}$	1M	
$\dfrac{CM}{\sin(180° - 75° - 53.13010235°)} \approx \dfrac{21}{\sin 75°}$		
$CM \approx 17.10154643$ cm		
$CM \approx 17.1$ cm	1A	r.t. 17.1 cm
	----------(3)	
(b) (i) By cosine formula,		
$AC^2 = AM^2 + CM^2 - 2(AM)(CM)\cos\angle AMC$	1M	
$AC^2 \approx (35 - 17.10154643)^2 + (17.10154643)^2 - 2(35 - 17.10154643)(17.10154643)\cos 107°$		
$AC \approx 28.13898297$ cm		
$AC \approx 28.1$ cm	1A	r.t. 28.1 cm
(ii) CN		
$= CM\cos\angle BCM$	1M	any one
$\approx 17.10154643\cos 53.13010235°$		
≈ 10.26092786		
By cosine formula,		
$AB^2 = BC^2 + AC^2 - 2(AC)(BC)\cos\angle ACB$		
$\cos\angle ACB \approx \dfrac{21^2 + (28.13898297)^2 - 28^2}{2(28.13898297)(21)}$		
$\angle ACB \approx 67.6818202°$		
By cosine formula,		
$AN^2 = CN^2 + AC^2 - 2(CN)(AC)\cos\angle ACB$		
$AN^2 \approx (10.26092786)^2 + (28.13898297)^2 - 2(10.260927867)(28.13898297)\cos 67.6818202°$		
$AN \approx 26.03453787$		
By sine formula,		
$\dfrac{AC}{\sin\angle ANC} = \dfrac{AN}{\sin\angle ACN}$		
$\dfrac{28.13898297}{\sin\angle ANC} \approx \dfrac{26.03453787}{\sin 67.6818202°}$		
$\angle ANC \approx 89.06498097°$ or $\angle ANC \approx 90.93501903°$		
So, $\angle ANC$ is not a right angle.	1M	
Hence, $\angle ANM$ is not the angle between the face BCM and the horizontal ground.		
Thus, the claim is disagreed.	1A	f.t.

Solution	Marks	Remarks
CN		
$= CM\cos\angle BCM$	1M	
$\approx 17.10154643\cos 53.13010235°$		
≈ 10.26092786		
By cosine formula,		
$AB^2 = BC^2 + AC^2 - 2(AC)(BC)\cos\angle ACB$		any one
$\cos\angle ACB \approx \dfrac{21^2 + (28.13898297)^2 - 28^2}{2(28.13898297)(21)}$		
$\angle ACB \approx 67.6818202°$		
By cosine formula,		
$AN^2 = CN^2 + AC^2 - 2(CN)(AC)\cos\angle ACB$		
$AN^2 \approx (10.26092786)^2 + (28.13898297)^2 - 2(10.260927867)(28.13898297)\cos 67.6818202°$		
$AN \approx 26.03453787$		
$CN^2 + AN^2 \approx (10.26092786)^2 + (26.03453787)^2$		
$CN^2 + AN^2 \approx 783.0838027$		
$AC^2 \approx (28.13898297)^2$		
$AC^2 \approx 791.8023627$		
Hence, we have $CN^2 + AN^2 \neq AC^2$.		
So, $\angle ANC$ is not a right angle.	1M	
Therefore, $\angle ANM$ is not the angle between the face BCM and the horizontal ground.		
Thus, the claim is disagreed.	1A	f.t.
CN		
$= CM\cos\angle BCM$	1M	
$\approx 17.10154643\cos 53.13010235°$		
≈ 10.26092786		
By cosine formula,		
$AB^2 = BC^2 + AC^2 - 2(AC)(BC)\cos\angle ACB$		any one
$\cos\angle ACB \approx \dfrac{21^2 + (28.13898297)^2 - 28^2}{2(28.13898297)(21)}$		
$\cos\angle ACB \approx 0.379749707$		
Suppose that N' is the foot of the perpendicular from A to BC .		
CN'		
$= AC\cos\angle ACB$		
$\approx 28.13898297(0.379749707)$		
≈ 10.68577054		
Hence, we have $CN' \neq CN$.		
So, N is not the foot of the perpendicular from A to BC .	1M	
Therefore, $\angle ANM$ is not the angle between the face BCM and the horizontal ground.		
Thus, the claim is disagreed.	1A	f.t.
	----------(5)	

Solution	Marks	Remarks
19. (a) (i) The required area		
$= 9\times10^6(1+r\%)-3\times10^5$	1A	
$=(870+9r)\times10^4\ \text{m}^2$		
(ii) $(9\times10^6(1+r\%)-3\times10^5)(1+r\%)-3\times10^5=1.026\times10^7$	1M	
$150(1+r\%)^2-5(1+r\%)-176=0$	1M	$3r^2+590r-6200=0$
$1+r\%=\frac{11}{10}$ or $1+r\%=\frac{-16}{15}$ (rejected)		
Thus, we have $r=10$.	1A	
	----------(4)	
(b) (i) The required area		
$=9\times10^6(1.1)^{n-1}-3\times10^5(1.1)^{n-2}-3\times10^5(1.1)^{n-3}-3\times10^5(1.1)^{n-4}-\cdots-3\times10^5$	1M	
$=9\times10^6(1.1)^{n-1}-3\times10^5\left(\frac{(1.1)^{n-1}-1}{1.1-1}\right)$	1M	for sum of geometric sequence
$=9\times10^6(1.1)^{n-1}-3\times10^6((1.1)^{n-1}-1)$		
$=(6(1.1)^{n-1}+3)\times10^6\ \text{m}^2$	1A	
(ii) When $(6(1.1)^{n-1}+3)\times10^6>4\times10^7$, we have $(1.1)^{n-1}>\frac{37}{6}$.		
Hence, we have $\log(1.1)^{n-1}>\log\left(\frac{37}{6}\right)$.	1M	
So, we have $(n-1)\log1.1>\log\left(\frac{37}{6}\right)$.		
Therefore, we have $n-1>\frac{\log\left(\frac{37}{6}\right)}{\log1.1}$.		
Solving, we have $n>20.08671715$.		
Thus, the total floor area of all public housing flats will first exceed $4\times10^7\ \text{m}^2$ at the end of the 21st year.	1A	
	----------(5)	
(c) Note that $a(1.21)^1+b=1\times10^7$ and $a(1.21)^2+b=1.063\times10^7$.		
Solving, we have $a=\frac{300}{121}\times10^6$ and $b=7\times10^6$.	1M	
Consider $(6(1.1)^{n-1}+3)\times10^6>\left(\frac{300}{121}(1.21)^n+7\right)\times10^6$ …… (*) .		
So, we have $\frac{-300}{121}(1.21)^n-7+6(1.1)^{n-1}+3>0$.		
Therefore, we have $75((1.1)^n)^2-165(1.1)^n+121<0$.	1M	$3((1.1)^{n-1})^2-6(1.1)^{n-1}+4<0$
Δ		
$=(-165)^2-4(75)(121)$		
$=-9075$		
<0		
Since $75>0$, we have $75((1.1)^n)^2-165(1.1)^n+121>0$ for all n .		
Hence, there is no solution for (*) .	1M	
Thus, the claim is incorrect.	1A	f.t.
	----------(4)	

Paper 2

Question No.	Key	Question No.	Key
1.	B (69)	26.	A (42)
2.	D (81)	27.	B (68)
3.	D (85)	28.	A (80)
4.	C (75)	29.	D (57)
5.	A (40)	30.	B (54)
6.	C (70)	31.	B (52)
7.	B (59)	32.	B (40)
8.	A (59)	33.	A (64)
9.	D (66)	34.	D (29)
10.	A (45)	35.	D (46)
11.	D (65)	36.	A (60)
12.	C (31)	37.	C (46)
13.	C (63)	38.	C (47)
14.	D (21)	39.	A (29)
15.	B (71)	40.	B (21)
16.	B (33)	41.	D (39)
17.	B (56)	42.	B (37)
18.	C (37)	43.	A (30)
19.	C (56)	44.	C (64)
20.	D (58)	45.	C (37)
21.	C (46)		
22.	A (48)		
23.	B (56)		
24.	A (54)		
25.	D (36)		

Note: *Figures in brackets indicate the percentages of candidates choosing the correct answers.*