1	Use of $b^2 - 4ac$
	Obtain $k^2 - 20k + 64$
	Attempt solution of quadratic equation or inequality
	Obtain $k < 4,\ k > 16$ or clear equivalent

4(a)	$\{10\} - (x\ \{+\}\{3\})^2$
4(b)	State reflection in x-axis
	Obtain $m = -3$
	Obtain $n = 10$

3(a)	Solve $2x-3=5x+2$ to obtain $-\frac{5}{3}$
	Attempt solution of linear equation where $2x$ and $5x$ have different signs
	Obtain $\frac{1}{7}$
	Alternative Method for Question 3(a)
	State or imply non-modulus equation $(2x-3)^2=(5x+2)^2$
	Attempt complete solution of three-term quadratic equation
	Obtain $-\frac{5}{3}$ and $\frac{1}{7}$ or equivalents
3(b)	State or imply $\cos\theta=-\frac{3}{5}$
	Attempt correct process for finding third quadrant angle
	Obtain 4.07

7(a)	Substitute $x = -2$, equate to zero and attempt solution
	Obtain $32 - 8k + 4k - 34 + 18 = 0$ or equivalent and hence $k = 4$
7(b)	State $\alpha = -2$
	Divide by $x + 2$ at least as far as $2x^3 + mx$
	Obtain $2x^3 + 4x + 9$
	Rearrange $2x^3 + 4x + 9 = 0$ to confirm $x = \sqrt[3]{-2x - 4.5}$
7(c)	Consider sign of $x - \sqrt[3]{-2x - 4.5}$ or equivalent for -1.4 and -1.0
	Obtain –0.2... and 0.3… or equivalents and justify conclusion
7(d)	Use iterative process correctly at least once
	Obtain final answer -1.26
	Show sufficient iterations to 5 sf to justify answer or show sign change in interval $[-1.265, -1.255]$

2(a)	State or imply $2 = \log_4 4^2$
	Use log power, product or quotient law e.g. $2\log_4 (3x - 1) = \log_4 (3x - 1)^2$
	Obtain a correct equation in any form, free of logs
2(b)	Solve 3-term quadratic
	Obtain answer 4.59 only

10(a)	State or imply the form $A + \dfrac{B}{3+x} + \dfrac{Cx+D}{2+x^2}$
	Use a correct method for finding a constant
	Obtain one of $A = 1$, $B = -4$, $C = 1$ and $D = -3$
	Obtain a second value
	Obtain a third value
	Obtain all four correct values

10(b)	Use a correct method to find the first two terms in the expansion of $(3+x)^{-1}$, $\left(1+\frac{x}{3}\right)^{-1}$, $(2+x^2)^{-1}$ or $\left(1+\frac{x^2}{2}\right)^{-1}$
	Obtain correct unsimplified expansions up to the term in x^2 of each partial fraction
	Multiply $(Cx+D)$ by the expansion of $\left(1+\frac{x^2}{2}\right)^{-1}$ up to the term in x^2 where $CD \neq 0$
	Obtain final answer $-\frac{11}{6}+\frac{17}{18}x+\frac{65}{108}x^2$

3	For attempt to resolve in any direction to form an equation or expression
	Vertically: $(Y=)\ \pm(45+28\sin 35-72\sin 50-35\sin 60)$
	Horizontally: $(X=)\ \pm(28\cos 35+72\cos 50-35\cos 60)$
	$R=\sqrt{(\mathit{their}\ 24.4059...)^2+(\mathit{their}\ 51.7169...)^2}$
	$\theta=\tan^{-1}\left(\frac{\mathit{their}\ 24.4059...}{\mathit{their}\ 51.7169...}\right)\left[=\tan^{-1}0.4719...\right]$ OR $\alpha=\tan^{-1}\left(\frac{\mathit{their}\ 51.7169...}{\mathit{their}\ 24.4059...}\right)\left[=\tan^{-1}2.1190...\right]$

3	$R = 57.2$ N Direction is 25.3° below the positive x-direction or bearing 115°

7(a)	$v=\frac{1}{3}\left(2t^2-11t+12\right)\Rightarrow\frac{dv}{dt}=\frac{1}{3}\left(4t-11\right)$
	$\frac{1}{3}\left(4\times 2-11\right)=-1\text{m s}^{-2}$
7(b)	Attempt to integrate
	$s=\frac{1}{3}\left(\frac{2t^3}{3}-\frac{11t^2}{2}+12t\right)(+c)$
	[P changes direction when] t = 1.5
	Attempt to evaluate their $\frac{1}{3}\left(\frac{2t^3}{3}-\frac{11t^2}{2}+12t\right)$ for t = 0 to t = 1.5 **and** t = 1.5 to t = 3
	Total distance is $\left[2.625+\lvert -1.125\rvert =\right]$ 3.75 m

7(c)	Attempt to evaluate their s for $t = 0$ to $t = 4$
	$\int_0^4 v\,\mathrm{d}t = \frac{8}{9} > 0$ so, no P does not return to O

3(a)	Median = [$]32400
	[IQR = $]33500 – [$]31300
	= [$]2200

3(b)	[Mean =] $\frac{878.3+896.5}{54}\left[=32.867\right]$
	so [$]32900
	[Variance =] $\left[\frac{28616.09+29815.63}{54}-\left(\frac{1774.8}{54}\right)^2=\right]$ $\frac{58431.72}{54}-\left(\frac{1774.8}{54}\right)^2$
	= 1.8511
	σ = 1.36, so σ = [$]1360

1(a)	$e^{-3}(\frac{3^3}{3!}+\frac{3^4}{4!}) = e^{-3}(4.5 + 3.375) = 0.22404 + 0.16803$
	$= 0.392$ (3 sf)
1(b)	$\lambda = 5$
	$1 - e^{-5}(1 + 5 + \frac{5^2}{2!}) = 1 - e^{-5}(1+5+12.5)$ $= 1 - (0.0067379 + 0.0336897 + 0.0842243\ )$
	$= 0.875$ (3 sf)
1(c)	$T \sim N(600, 600)$
	$\frac{559.5-600}{\sqrt{600}}$ $[= -1.653]$
	$\Phi(\text{'}-1.653\text{'}) = 1 - \Phi(\text{'}1.653\text{'})$
	$= 0.0492$ (3 sf) or 0.0491