Question Number	Scheme	Marks
1.	$\int\left(\frac{1}{2}x^3+\frac{3}{\sqrt{x}}-4\right)\mathrm{d}x=\frac{1}{2}\times\frac{x^4}{4}+3\times\frac{x^{\frac{1}{2}}}{\frac{1}{2}}-4x+c$	M1, A1
	$=\frac{1}{8}x^4+6x^{\frac{1}{2}}-4x+c$	A1, A1 **(4 marks)**

M1: For raising any correct index by 1. So, award for $x^3\rightarrow x^4$, $x^{-\frac{1}{2}}\rightarrow x^{\frac{1}{2}}$ or $-4\rightarrow -4x$ (allowing $-4x^1$)
The index must be processed and not left, for example, as x^{3+1}

A1: For **two** of $\frac{1}{2}\times\frac{x^4}{4}$, $+3\times\frac{x^{\frac{1}{2}}}{\frac{1}{2}}$, $-4x$ (allowing $-4x^1$) correct simplified or correct unsimplified.

A1: For **two** of $\frac{1}{8}x^4$, $+6x^{\frac{1}{2}}$, $-4x$ correct and in simplest form.

Accept forms such as $0.125x^4$, $+6\sqrt{x}$ and $-4x^1$ and $+-4x^1$

A1: Fully correct, and simplified with $+c$ all on a single line. Accept simplified equivalents (see above)
Ignore any spurious notation such as $\int\frac{1}{8}x^4+6x^{\frac{1}{2}}-4x+c$ or $\frac{1}{8}x^4+6x^{\frac{1}{2}}-4x+c\,\mathrm{d}x$
If they go on, however, and multiply for example by 8 then it is A0 or integrate again it is A0.
They can do this in one line for full marks

Question Number	Scheme	Marks
2. (a)	$5(x+3)>4(2x-5)\Rightarrow 5x+15>8x-20\Rightarrow ax>b$ or $px<q$	M1
	$\Rightarrow x<\frac{35}{3}$	A1
		(2)
(b) (i)	$x^2-6x+1=(x-3)^2\pm...=(x-3)^2-8$	M1, A1
(ii)	$(x-3)^2-8=0\Rightarrow x=3+\sqrt{8}$ or $3-\sqrt{8}$	M1
	$x^2-6x+1\geqslant 0\Rightarrow x\leqslant 3-\sqrt{8}, x\geqslant 3+\sqrt{8}$	A1
		(4)
(c)	$x\leqslant 3-\sqrt{8},\ 3+\sqrt{8}\leqslant x<\frac{35}{3}$	B1
		(1)
		(7 marks)

This is effectively a non- calculator question and methods must be clearly shown.

(a)

M1: Attempts to expand brackets and then collect terms. Look for

- $5x\pm 15>8x\pm 20$
- followed by $ax>b$ or $px<q$

Also condone with an = sign in place of the inequality

A1: $x<\frac{35}{3}$ or exact equivalent such as $\frac{35}{3}>x$ **following the award of M1.**

Do not accept $x<11.66$ or $x<11.7$ but $x<11.\dot{6}$ is acceptable and ISW after a correct answer

Mark part (b) as one question

(b) (i)

M1: Starts the process by writing x^2-6x+1 as $(x-3)^2\pm c$, where c is a constant (which may not be simplified)

A1: $x^2-6x+1=(x-3)^2-8$. It is acceptable to write this down for the two marks

(b) (ii) **Note that this must follow on from their (b)(i) and CANNOT be restarted via the quadratic formula**

M1: Correctly solves their $(x+a)^2-b=0,\ b>0$ and finds at least one critical value.

Look for an intermediate line of working such as $(x+a)^2=b$ or $x+a=\pm\sqrt{b}$

Do not allow decimals, i.e. awrt 5.83, 0.17 but isw after a correct (exact) answer

It can be implied by an attempt to solve their inequality as long as an intermediate line is seen.

E.g. $(x+a)^2-b\geqslant 0,\ b>0\Rightarrow x+a...\sqrt{b}\Rightarrow x...-a+\sqrt{b}$ where … can even be an incorrect inequality

Again, it is important to see an intermediate line of working.

A1: $x\leqslant 3-\sqrt{8}, x\geqslant 3+\sqrt{8}$ o.e following the award of M1

ISW if this is subsequently changed to decimals. Accept $\sqrt{8}$ as $2\sqrt{2}$