Question Number	Scheme	Marks
10ai	$(n=)\ 3$	B1
ii	1080	B1
		(2)
b	$(1620,\ -3)$	B1B1
		(2)
c	e.g. $k=\frac{1}{2}\left(\frac{12}{5}-\frac{3}{5}\right)=\frac{9}{10}$	M1A1
		(2)
		(6 marks)

Note: answers may appear next to questions or on the diagram.
If there is a contradiction between the answer by the question/on the diagram and the main body of the work then the answer in the main body of the work takes precedence.

(a)

(i)

B1: $(n=)\ 3$

(ii)

B1: 1080 (must be in degrees). Do not accept e.g. (1080, 3)

(b)

B1: One of the two coordinates $(1620,\ -3)$ Condone missing brackets. Allow *x*=… , *y* = ….
Condone 9π instead of 1620 for this mark and condone the coordinates to be the wrong way round e.g. $(-3,\ 1620)$ scores B1B0

B1: Both coordinates $(1620,\ -3)$ Condone missing brackets. Allow *x* =… , *y* = ….

(c)

M1: Attempts to find a value for *k* by either

- attempting to find $k=\frac{1}{2}\left(\frac{12}{5}-\frac{3}{5}\right)=...$.
- attempting to find $k=\frac{12}{5}-\frac{1}{2}\left(\frac{12}{5}+\frac{3}{5}\right)=...$ or $k=-\frac{3}{5}+\frac{1}{2}\left(\frac{12}{5}+\frac{3}{5}\right)=...$
- forming two **correct** simultaneous equations and eliminating sin *a* (may be labelled as a different variable, condone *a* for sin *a*)
  $2\sin(a)+k=\frac{12}{5},\ -2\sin(a)+k=-\frac{3}{5}\Rightarrow k=...$ scores M1
  They must have correctly used $\sin(-a)=-\sin(a)$. If they eliminate *k* instead, they must proceed to find *a* or $\sin a$ and then substitute back into one of the equations to find a value for *k*
  i.e. $4\sin a=3\Rightarrow a=48.59...\Rightarrow 2\sin(48.59...)+k=\frac{12}{5}\Rightarrow k=...$

A1: $\frac{9}{10}$ or 0.9 (this is not awrt 0.9 so if they achieve a rounded value e.g. 0.899… and round to 0.9 then M1A0)

Question Number	Scheme	Marks
11a	$2(x\pm...)^2$	B1
	$...(x\pm3)^2...$	M1
	$2(x-3)^2-4$	A1
		(3)
b	$(3,-4)$	B1ft
		(1)
c	$m=\frac{28--4}{-1-3}\ (=-8)$	M1
	$y-28=-8(x+1)$	dM1
	$y=-8x+20$	A1
		(3)
d	$y\leqslant$ "$-8x+20$" and $y\geqslant 2x^2-12x+14$ (or $y\geqslant$ "$2(x-3)^2-4$")	B1ftB1ft
	$y\leqslant -8x+20$ $\quad y\geqslant 2x^2-12x+14$ $\quad y\geqslant 0,\ x\geqslant 0$	B1cso
		(3)
		(10 marks)

Note: answers may appear next to questions or on the diagram.
If there is a contradiction between the answer by the question/on the diagram and the main body of the work then the answer in the main body of the work takes precedence.

(a)

B1: $a=2$ which may be stated or seen in the expression $2(x\pm...)^2$.

M1: $...(x\pm3)^2...$ may be implied by $b=\pm3$. Accept unsimplified versions e.g. $...\left(x\pm\frac{12}{4}\right)^2...$

A1: $2(x-3)^2-4$ isw following a correct expression (e.g. if they proceed to state incorrect values for *a*, *b* and/or *c*). If they just state the values then withhold this mark. Constants must be integers.

SC110 $2(x-3)-4$ (slip writing missing the squared on the bracket)

(b)

B1ft: $(3,-4)$ or e.g. $x=3,\ y=-4$. Condone invisible brackets. Follow through from their part (a) so score for $(-b,\ c)$