A1: Fully defines region correctly (**not ft here**).

E.g. $3x-12<y<2(x-4)(x-10),\quad 0<x<4\left(\text{or } x>0, x<4\right)$

Or e.g. $y>3x-12,\ y<2(x-4)(x-10),\ x>0\ ,\ x<4$

The right hand side of the inequality $0<x<4$ may be larger. Accept $0<x<p$ as long as $4\leqslant p\leqslant\frac{23}{2}$

Allow **consistent** use of $>\leftrightarrow\geqslant$ for all of their inequalities.

Question Number	Scheme	Marks
9(a)	π	B1
		(1)
(b)(i)	3	B1
		(1)
(ii)	5	B1
		(1)
(iii)	201	B1
		(1)
		(4 marks)

(a)

B1: Period is π (radians) but condone $180°$ or just 180

(b)(i)

B1: 3

(ii)

B1: 5

(iii)

B1: 201

Question Number	Scheme	Marks
10(a)	One of $-\frac{20}{3} < x < -6, \quad x > \frac{3}{2}$	M1
	Both $-\frac{20}{3} < x < -6, \quad x > \frac{3}{2}$	A1
		(2)
(b)	$(3x+20)(x+6)(2x-3) = (3x+20)\left(2x^2+9x-18\right) =$	M1
	$= 6x^3 + 67x^2 + 126x - 360$	A1 A1
		(3)
(c)	$\frac{dy}{dx} = 18x^2 + 134x + 126 \Rightarrow$ Gradient at $x = 0$ is 126	M1
	Equation of l is $y = 126x - 360$	A1ft
	l cuts C again when $6x^3 + 67x^2 + 126x - 360 = 126x - 360$	dM1
	$6x^3 + 67x^2 = 0 \Rightarrow x^2(6x+67) = 0$	ddM1
	$x = -\frac{67}{6}$	A1
		(5)
		(10 marks)

(a)

M1: One of $-\frac{20}{3} < x < -6, \quad x > \frac{3}{2}$. Condone with $< \leftrightarrow \leqslant$ for this mark and allow equivalent notation e.g. $\left(-\frac{20}{3}, -6\right), \quad \left(\frac{3}{2}, \infty\right), \left[-\frac{20}{3}, -6\right], \left[\frac{3}{2}, \infty\right)$

Allow the first inequality to be written separately as e.g. $x > -\frac{20}{3}, \ x < -6$,

$x > -\frac{20}{3}$ and $x < -6$

Condone incorrect notation e.g. $-\frac{20}{3} < \mathrm{f}(x) < -6, \quad \mathrm{f}(x) > \frac{3}{2}$

or e.g. $-\frac{20}{3} < y < -6, \quad y > \frac{3}{2}$

A1: Both $-\frac{20}{3} < x < -6, \quad x > \frac{3}{2}$.

Allow the first inequality to be written separately as e.g. $x > -\frac{20}{3}, \ x < -6$ and allow equivalent notation e.g. $\left(-\frac{20}{3}, -6\right), \quad \left[\frac{3}{2}, \infty\right)$ but **not** e.g. $-\frac{20}{3} < \mathrm{f}(x) < -6, \quad \mathrm{f}(x) > \frac{3}{2}$