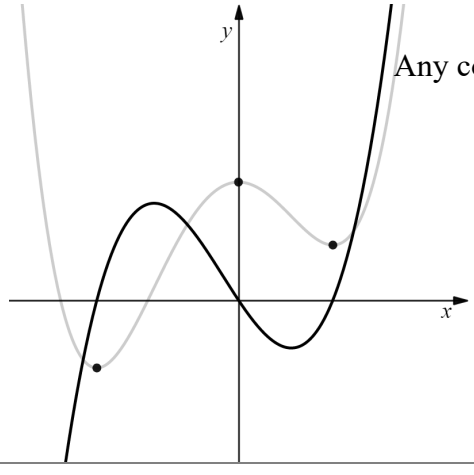
Question	Scheme	Marks	AOs
10 (a)	States either $x<-3$ or $0<x<2$	M1	1.1b
	States $\{x\in\mathbb{R}:x<-3\}\cup\{x\in\mathbb{R}:0<x<2\}$ oe using set notation	A1	2.5
		(2)	
(b)	Point Q as $f''(x)<0$ at maximum point	B1	2.4
		(1)	
(c)	States either $k=10$ or $k=5$	B1	1.1b
	States both $k=10$ and $k=5$	B1	3.1a
		(2)	
(d)	 Any correct point where $f'(x)=0$	B1	1.1b
	Correct shape	M1	1.1b
	Correct shape and position	A1	1.1b
		(3)	
			(8 marks)

Notes:

(a)

M1: States either region. Condone $\leqslant$ for $<$

A1: States given answer but condone $\{x\in\mathbb{R}:x<-3\cup 0<x<2\}$ oe using set notation.

Allow $\{x\in\mathbb{R}:x<-3$ or $0<x<2\}$ or even $\{x<-3\ \cup\ 0<x<2\}$ but not $\{x<-3\ \cap\ 0<x<2\}$ or not $\{x<-3, 0<x<2\}$

(b)

B1: Gives valid reason. E.g $f''(x)<0$ at maximum point

(c)

B1: Determines that $y=k$ crosses $y=f(x)$ 3 times only when $k=10$ **or** when $k=5$

B1: Determines that $y=k$ crosses $y=f(x)$ 3 times only when $k=10$ **and** when $k=5$ only

(d)

B1: Graph crosses x-axis at any x value corresponding to point P, Q or R

M1: Correct shape

A1: Fully correct