Question	Scheme	Marks	AOs
11 (a)	$\mathrm{f}(x) \geqslant 5$	B1	1.1b
		(1)	
(b)	Uses $-2(3-x)+5=\frac{1}{2}x+30$	M1	3.1a
	Attempts to solve by multiplying out bracket, collect terms etc $\frac{3}{2}x=31$	M1	1.1b
	$x=\frac{62}{3}$ only	A1	1.1b
		(3)	
(c)	Makes the connection that there must be two intersections. Implied by either end point $k>5$ or $k \leqslant 11$	M1	2.2a
	$\{k : k \in \mathbb{R}, 5<k \leqslant 11\}$	A1	2.5
		(2)	
			(6 marks)

Notes:

(a)

B1: $\mathrm{f}(x) \geqslant 5$ Also allow $\mathrm{f}(x) \in [5, \infty)$

(b)

M1: Deduces that the solution to $\mathrm{f}(x)=\frac{1}{2}x+30$ can be found by solving

$$-2(3-x)+5=\frac{1}{2}x+30$$

M1: Correct method used to solve their equation. Multiplies out bracket/ collects like terms

A1: $x=\frac{62}{3}$ only. Do not allow 20.6

(c)

M1: Deduces that two distinct roots occurs when $y=k$ intersects $y=\mathrm{f}(x)$ in two places. This may be implied by the sight of either end point. Score for sight of either $k>5$ or $k \leqslant 11$

A1: Correct solution only $\{k : k \in \mathbb{R}, 5<k \leqslant 11\}$