Question Number	Scheme	Notes	Marks
2	$y^2 = 10x$ $\quad y^2 = 4ax,\ x = at^2,\ y = 2at,$ focus : $(a, 0)$, directrix : $x = -a$		
(a) (i) & (ii)	Focus is $\left(\frac{5}{2}, 0\right)$ **or** directrix is $x = -\frac{5}{2}$ oe e.g., $2x + 5 = 0$	Correct focus (may be given as $x = \frac{5}{2},\ y = 0$) **OR** any correct **equation** for directrix	**B1**
	Focus is $\left(\frac{5}{2}, 0\right)$ **and** directrix is $x = -\frac{5}{2}$ oe	Correct focus (may be given as $x = \frac{5}{2},\ y = 0$) **and** directrix. Allow $\frac{10^2}{4}$ or $2\frac{1}{2}$ or 2.5 for both marks	**dB1**
	SC: Allow B1dB0 for $(k, 0)$ & $x = -k \quad k > 0,\ k \neq 4$ Just $a = \frac{5}{2}$ is 00 unless $(a, 0)$, $x = -a$ areseen		
			(2)
(b)	20	Correct distance	**B1**
			(1)
(c)	$x_P = 20 - "\frac{5}{2}" = \ldots \left(= \frac{35}{2}\right)$	Correct ft value for the x coordinate of P with 20 and their a where $0 < a < 20$. If $a = \ldots$ is not seen or implied and their focus and directrix are not consistent then look for $20 - a = \ldots$ from a directrix of $x = -a,\ a > 0$. Ignore any extra x-coordinates	**B1ft**
	$y_P = (\pm)\sqrt{20^2 - (17.5 - 2.5)^2}$ or $y = (\pm)\sqrt{10 \times \frac{35}{2}}$	A correct numerical expression or value for one of the y coordinates of P. Allow awrt $(\pm)13.2$ **Not an ft mark**	**M1**
	$\left(\frac{35}{2}, \pm 5\sqrt{7}\right)$ or e.g., $\left(17.5, \sqrt{175}\right), \left(17.5, -\sqrt{175}\right)$	Fully correct exact coordinates of P May be given as $x = \ldots\ y = \ldots$ Answer only is acceptable. No extra coordinates unless rejected	**A1**
	Using a parameter (scheme above still applies): $P\left(at^2, 2at\right) = P\left(\frac{5}{2}t^2, 5t\right) \Rightarrow \frac{5}{2}t^2 = 20 - \frac{5}{2} \Rightarrow t = \pm\sqrt{\frac{2}{5} \times \frac{35}{2}} = \sqrt{7} \Rightarrow P\left(\frac{35}{2}, \pm 5\sqrt{7}\right)$ Allow B1ft for a consistent $x = \ldots$ from $"\frac{5}{2}"t^2 + "\frac{5}{2}" = 20$ provided $0 < "\frac{5}{2}" < 20$ May also see e.g., $20^2 = \left(\frac{5}{2}t^2 - \frac{5}{2}\right)^2 + (5t)^2 \Rightarrow t^4 + 2t^2 - 63 = (t^2 - 7)(t^2 + 9) = 0 \Rightarrow t = \pm\sqrt{7} \Rightarrow P\left(\frac{35}{2}, \pm 5\sqrt{7}\right)$ Calculators may be used to solve equations in solutions such as: $\left(x - \frac{5}{2}\right)^2 + y^2 = 20^2 \Rightarrow x^2 + 5x - \frac{1575}{4} = 0 \Rightarrow 4x^2 + 20x - 1575 = (2x - 35)(2x + 45) = 0 \Rightarrow x = \frac{35}{2}$		
			(3)
			(Total 6 marks)