Question	Scheme	Marks
4 (i)(a)	$p+q=\frac{7}{25}$ oe $\quad q+r=\frac{1}{5}$ oe $\quad p+r=\frac{8}{25}$ oe	M1 M1 M1
	$2p+2q+2r=\frac{7}{25}+\frac{1}{5}+\frac{8}{25}\left[=\frac{4}{5}\right]$*	A1* (4)
(i)(b)	eg $p+q+r+s=1$	M1
	$p=\frac{1}{5}$ oe $\quad q=\frac{2}{25}$ oe $\quad r=\frac{3}{25}$ oe $\quad s=\frac{3}{5}$ oe	A1 A1 A1 A1
		(5)
(ii)	$\frac{x}{x+5}+\frac{5}{x}=\frac{x^2+5(x+5)}{x(x+5)}$ or $\frac{x}{x+5}+\frac{5}{x}=\frac{x+5-5}{x+5}+\frac{5}{x}$	M1
	$=\frac{x^2+5x+25}{x^2+5x}$ oe or $=1-\frac{5}{x+5}+\frac{5}{x}$	M1
	$=1+\frac{25}{x^2+5x}$ or as $x^2+5x+25>x^2+5x$ $\mathrm{P}(C)+\mathrm{P}(D)>1$ or As $x+5>x$ then $\frac{5}{x+5}<\frac{5}{x}\Rightarrow-\frac{5}{x+5}+\frac{5}{x}>0$ So $\mathrm{P}(C)+\mathrm{P}(D)>1$	A1
	$\mathrm{P}(C\cup D)>1$ or $\mathrm{P}(C\cap D)>0$	A1 cso
		(4)

	Notes	**Total 13**
	NB In (i) Allow the use of exact decimals throughout and mark (a) and (b) together	
(i)(a)	**M1**	for $p+q=\frac{7}{25}$ oe or $p+q=\mathrm{P}(A)$
	M1	for $q+r=\frac{1}{5}$ oe or $q+r=\mathrm{P}(B)$
	M1	for $p+r=\frac{8}{25}$ oe or $p+r=P\left[\left(A\cap B'\right)\cup\left(A'\cap B\right)\right]$
	A1*	we must see $2p+2q+2r=\frac{7}{25}+\frac{1}{5}+\frac{8}{25}$ and no errors
(i)(b)	**M1**	any correct equation involving at least two of *p*, *q*, *r* and *s*. May be implied by two correct values. Do not allow just $2p+2q+2r=\frac{4}{5}$ This mark may be awarded in part (a)
	A1	for $\frac{1}{5}$ or 0.2 oe This mark may be awarded in part (a)
	A1	for $\frac{2}{25}$ or 0.08 oe This mark may be awarded in part (a)
	A1	for $\frac{3}{25}$ or 0.12 oe This mark may be awarded in part (a)
	A1	for $\frac{3}{5}$ oe This mark may be awarded in part (a)
	SC	for one correct value M0 A1 A0 A0 A0
(ii)	**M1**	For an attempt to add P(*C*) and P(*D*) e.g. $\frac{x^2}{x(x+5)}+\frac{5(x+5)}{x(x+5)}$ May be implied by $\frac{x^2+5x+25}{x^2+5x}$ or $1-\frac{5}{x+5}+\frac{5}{x}$
	M1	For $\frac{x^2+5x+25}{x^2+5x}$ oe or $1-\frac{5}{x+5}+\frac{5}{x}$
	A1	for recognising that $\mathrm{P}(C)+\mathrm{P}(D)$ is > 1
	A1 cso	a fully correct solution showing that *C* and *D* cannot be mutually exclusive