Question number	Scheme	Marks
9 (a)	$\frac{1}{(2-x)^3}=(2-x)^{-3}=\frac{1}{8}\left(1-\frac{x}{2}\right)^{-3} \Rightarrow p=\frac{1}{8},\ q=\frac{1}{2}$	B1B1 [2]
(b)	$\frac{1}{8}\left(1-\frac{x}{2}\right)^{-3}=\frac{1}{8}\left[1+(-3)\left(-\frac{x}{2}\right)+\frac{(-3)(-4)\left(-\frac{x}{2}\right)^2}{2!}+\frac{(-3)(-4)(-5)\left(-\frac{x}{2}\right)^3}{3!}\right]$	M1
	$=\frac{1}{8}+\frac{3}{16}x+\frac{3}{16}x^2+\frac{5}{32}x^3+\ldots$	A1A1 [3]
(c)	$(a+bx)\left(\frac{1}{8}+\frac{3}{16}x+\frac{3}{16}x^2\right)=\frac{a}{8}+x\left(\frac{2b}{16}+\frac{3a}{16}\right)+\left\{x^2\left(\frac{3a}{16}+\frac{3b}{16}\right)\right\}$	M1
	$\Rightarrow \frac{3}{8}=\frac{a}{8}\Rightarrow a=3$	A1
	$\Rightarrow -\frac{43}{16}=\frac{2b+3a}{16}\Rightarrow 2b=-43-9=-52\Rightarrow b=-26$	A1
		[3]
(d)	$\frac{3a+3b}{16}=\frac{9-78}{16}=-\frac{69}{16}$ oe	M1A1 [2]
		Total 10 marks

(a)	**NB** If p and q are stated then they must be correct but if p and q are not stated then $\frac{1}{8}\left(1-\frac{x}{2}\right)^{-3}$ scores B1B1
B1	$p=\frac{1}{8}$ (Allow $p=2^{-3}$)
B1	$q=\frac{1}{2}$

(b)	
M1	Attempts to use the binomial expansion for their $(1-qx)^{-3}$. Must have first term 1, three more terms with ascending powers of *x*, 2 or 2! and 6 or 3! seen , and their $\left(-\dfrac{x}{2}\right)$ used at least once. No simplification needed. Ignore terms beyond x^3
A1	Two algebraic terms correct in the expansion for their $(1-qx)^{-3}$.. Must be single fractions, not necessarily in lowest terms. Ignore terms beyond x^3
A1	All four terms correct and in lowest terms. Ignore terms beyond x^3
(c)	
M1	For either their $\dfrac{1}{8}a=\dfrac{3}{8}$ or their $\dfrac{3}{16}a+$ their $\dfrac{1}{8}b=-\dfrac{43}{16}$ May be implied by a correct value of *a* or *b*.
A1	$a=3$
A1	$b=-26$ **NB** answers $a=3$ and $b=-26$ scores 3/3
(d)	
M1	Substituting their *a* and their *b* into their $\dfrac{3a+3b}{16}$
A1	$-\dfrac{69}{16}$ oe **NB** If $p=2,\ q=\dfrac{1}{2}$ is used then $a=\dfrac{3}{16}$ and $b=-\dfrac{13}{8}$ which substituted into $3a+3b$ gives an answer of $-\dfrac{69}{16}$ but scores A0