Question number	Scheme	Marks
9 (a)	$1+\frac{1}{2}(-4x)+\frac{\frac{1}{2}\left(-\frac{1}{2}\right)(-4x)^2}{2!}+\frac{\frac{1}{2}\left(-\frac{1}{2}\right)\left(-\frac{3}{2}\right)(-4x)^3}{3!}$	M1
	$1-2x-2x^2-4x^3$	A1 A1 (3)
(b)	$x = 0.06$ $1 - 0.12 - 0.0072 - 0.000864$ 0.8719	B1 M1 A1 (3)
(c)	$\sqrt{\frac{76}{100}}=\frac{1}{5}\sqrt{19}$ $\sqrt{19}=0.8719\times 5$ 4.360	M1 A1 (2)
		[8]

Part	Mark	Additional Guidance
(a)	M1	For an attempt at a Binomial expansion. A attempt is defined as the following • The expansion must start with 1 • The powers of x must be correct • $-4x$ must be used at least once • The denominators (2! And 3!) must be seen. Accept 2 and 6 $(1-4x)^{\frac{1}{2}}=1+\left(\frac{1}{2}\right)(-4x)+\frac{\left(\frac{1}{2}\right)\left(-\frac{1}{2}\right)}{2!}(-4x)^2+\frac{\left(\frac{1}{2}\right)\left(-\frac{1}{2}\right)\left(-\frac{3}{2}\right)}{3!}(-4x)^3$
	A1	For at least one term in x correct and fully simplified. $1-2x-2x^2-4x^3$
	A1	For the expansion fully correct and simplified
(b)	B1	For finding the value of $x = 0.06$
	M1	For substituting **their** value of x into the expansion **provided** $\lvert x\rvert \leqslant 0.25$ Use of **their expansion** or the correct expansion must be seen explicitly here
	A1	0.8719
(c)	M1	For using their value from (b) in $\sqrt{0.76}=\frac{\sqrt{19}}{5}\Rightarrow\sqrt{19}=5\sqrt{0.76}=5\times\text{'0.8719'}$
	A1	For 4.360 rounded correctly
Penalise rounding once only in this question. Answers must round to the given answers.		