

Q	Marking instructions	AO	Marks	Typical solution
9(a)	Uses the binomial expansion to obtain either $\left(-\frac{1}{2}\right)x$ or $\frac{\left(-\frac{1}{2}\right)\left(-\frac{3}{2}\right)x^2}{2!}$ OE	1.1a	M1	$(1+x)^{-\frac{1}{2}} \approx 1 + \left(-\frac{1}{2}\right)x + \frac{\left(-\frac{1}{2}\right)\left(-\frac{3}{2}\right)x^2}{2!}$ $\approx 1 - \frac{1}{2}x + \frac{3}{8}x^2$
	Obtains $1 - \frac{1}{2}x + \frac{3}{8}x^2$ Must have evaluated coefficients – allow equivalent fractions.	1.1b	A1	
	Subtotal		2	

Q	Marking instructions	AO	Marks	Typical solution
9(b)	Explains that the expansion is only valid for $ x < 1$ OE Accept that the expansion is not valid for $ x > 1$ Must include the word valid or invalid .	2.3	E1	The expansion is valid for $ x < 1$
	Subtotal		1	

Q	Marking instructions	AO	Marks	Typical solution
9(c)	Substitutes $x = -\frac{1}{4}$ into their answer to part (a)	1.1a	M1	$1 - \frac{1}{2}\left(-\frac{1}{4}\right) + \frac{3}{8}\left(-\frac{1}{4}\right)^2 = \frac{147}{128}$ $\left(\frac{3}{4}\right)^{-\frac{1}{2}} = \frac{2}{\sqrt{3}}$ $\frac{2}{\sqrt{3}} = \frac{147}{128}$ $\frac{1}{\sqrt{3}} = \frac{147}{256} \approx 0.574$
	Obtains $\frac{147}{128}$ AWRT 1.148 Condone 1.15 if a fully correct substituted expansion is seen.	1.1b	A1	
	Deduces the value 0.574 AWRT 0.574 or Deduces the value 0.580 AWRT 0.580	2.2a	A1	
	Subtotal		3	

	Question 9 Total		6	
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