Question number	Scheme	Marks
10 (a)	$(1-2x)^{-\frac{1}{2}} = 1 + \left(-\frac{1}{2}\right)(-2x) + \dfrac{\left(-\frac{1}{2}\right)\left(-\frac{3}{2}\right)(-2x)^2}{2!} + \dfrac{\left(-\frac{1}{2}\right)\left(-\frac{3}{2}\right)\left(-\frac{5}{2}\right)(-2x)^3}{3!}$ $\Rightarrow (1-2x)^{-\frac{1}{2}} = 1 + x + \dfrac{3}{2}x^2 + \dfrac{5}{2}x^3 + \dots$	M1A1A1 (3)
(b)	$-\dfrac{1}{2} \text{,, } x < \dfrac{1}{2}$ or $\|x\| < \dfrac{1}{2}$ (Allow $-\dfrac{1}{2} \text{,, } x \text{,, } \dfrac{1}{2}$ or $\|x\| \text{,, } \dfrac{1}{2}$)	B1 (1)
(c)	$\left(2-x^2\right)\left(1 + x + \dfrac{3}{2}x^2 + \dfrac{5}{2}x^3\right) = 2 + 2x + 2x^2 + 4x^3$	M1M1A1 (3)
(d)	$\displaystyle\int_0^{0.2} \dfrac{\left(2-x^2\right)}{\sqrt{\left(1-2x\right)}}\,dx = \int_0^{0.2} 2 + 2x + 2x^2 + 4x^3\,dx = \left[2x + x^2 + \dfrac{2}{3}x^3 + x^4\right]_0^{0.2}$ $= \left(0.4 + 0.04 + 0.00533 + 0.0016\right) = 0.4469$	M1M1 M1A1 (4) [11]

Additional Notes		
Part	**Mark**	**Guidance**
(a)	M1	An attempt at the binomial expansion which must have as a minimum; • The first term is 1 • The denominators in terms 2, 3 and 4 are correct. • The power of x is correct in each term $\left(-2x,\ [-2x]^2,\ [-2x]^3\right)$ • $-2x$ is used correctly at least once.
	A1	The first term and at least one term in x correct and simplified
	A1	All terms correct and simplified. $1 + x + \dfrac{3}{2}x^2 + \dfrac{5}{2}x^3$
(b)	B1	Correct inequality $-\dfrac{1}{2}\ ,,\ x < \dfrac{1}{2}$ or $\lvert x \rvert < \dfrac{1}{2}$ Allow $-\dfrac{1}{2}\ ,,\ x\ ,,\ \dfrac{1}{2}$ or $\lvert x \rvert\ ,,\ \dfrac{1}{2}$ isw other attempts when a correct range is seen.
(c)	M1	Shows that they intend to multiply their expansion in (a) by $\left(2 - x^2\right)$
	dM1	Multiplies out the two brackets to at least 4 terms up to and including the term in x^3 with a constant, term in x and a term in x^2
	A1	For the fully correct expansion as shown. $2 + 2x + 2x^2 + 4x^3$
(d)	**In part (d) the question clearly states using algebraic integration** **No evidence of algebraic integration – no marks**	
	M1	For an attempt to integrate their expansion in (c) provided it is as a minimum a constant term and at least two algebraic terms. Ignore the limits for this mark
	A1	**This is an M mark in Epen** For a fully correct integrated expression as shown (ignore limits)
	dM1	Attempts to evaluate their integrated expression using the correct limits Substitution of 0 need not be seen
	A1	Area = 0.4469