

7	(a)	$\frac{x^6}{8} \geq 0$ or $x^6 \geq 0$	B1 [1]	2.4	Do not accept $\frac{x^6}{8}$ is always positive (ie > 0)
7	(b)	The expansion with two terms is a better approximation than the one with three terms but it should be the other way round.	E1 [1]	2.3	O.E. See exemplars
7	(c)	$1 + \frac{1}{2}(-x^3) + \frac{1}{2}\left(-\frac{1}{2}\right)\frac{(-x^3)^2}{2!} + \frac{1}{2}\left(-\frac{1}{2}\right)\left(-\frac{3}{2}\right)\frac{(-x^3)^3}{3!} \dots$ $1 - \frac{x^3}{2} - \frac{x^6}{8} - \frac{x^9}{16} \dots$	M1 A2 [3]	1.1a 1.1 1.1	Working for 3 rd or 4 th term correct Must see the negative x^3 A2 all terms correct or A1 for three terms correct
7	(d)	$ x < 1$ oe	B1 [1]	1.1	
7	(e)	Goes through 2.5 on y-axis and (1,0) Right shape for values of x from -1 to 1	B1 B1 [2]	2.2a 1.1	Curve reaches between (-1, 3) to (-1, 4.5)
7	(f)	DR $2.5 \int_{-0.75}^{0.75} \left(1 - \frac{x^3}{2} - \frac{x^6}{8} - \frac{x^9}{16}\right) dx$ $[2.5] \left[x - \frac{x^4}{8} - \frac{x^7}{56} - \frac{x^{10}}{160} \right]_{-0.75}^{0.75}$	M1 M1	3.1b 1.1	For their expression from 7(c) in an integration. Condone dx missing. 2.5 and limits needed but may be seen later For integrating their expression (3 terms or more) allow one error Limits could be wrong or missing here

$$[2.5] \left[\left(0.75 - \frac{0.75^4}{8} - \frac{0.75^7}{56} - \frac{0.75^{10}}{160} \right) - \left(-0.75 - \frac{(-0.75)^4}{8} - \frac{(-0.75)^7}{56} - \frac{(-0.75)^{10}}{160} \right) \right]$$

3.74 m²

Special Case

If trapezium rule used on original function allow

M1 A1 maximum

M1

1.1

For attempt at their limits substituted into their integrand. Substitution *must* be seen.

A1

3.2a

AWRT 3.74 from correct working. Must include units. 1.495 will probably get either **M2** or **M3**
Annotate final page

Likely answers

If 2 strips used: 3.71m²

If 3 strips used: 3.72 m²

If 6 strips used: 3.73 m²

[4]

Exemplars for 7b

Accept (eg)

The 3-term expansion is further away than the one with 2 terms

The 3-term expansion moves away from the 2-term expansion

The 3-term expansion is on the wrong side of the graph of the 2-term expansion

The 3-term expansion goes up at the end

The 3-term expansion should be more accurate than a 2-term expansion [and it isn't]

The 3-term expansion moves away from the other 2

Do not accept (eg)

They don't follow the same shape