Q2	Model Solution – 25 Marks	Marking Notes
(a)	<table><tr><td>x</td><td>1</td><td>1.5</td><td>2</td><td>2.5</td><td>3</td><td>3.5</td><td>4</td></tr><tr><td>y</td><td>16.5</td><td>7.361</td><td>4</td><td>2.31</td><td>1.278</td><td>0.556</td><td>0</td></tr></table> y values found by subbing x values into $y = \frac{16}{x^2} - \frac{x}{2} + 1,\ x > 0$	MS (0, 3, 5) PC for 4 OR 2.31 OR correct working
(b)	$Area = \frac{h}{2}[y_1 + y_n + 2(y_2 + y_3 + y_4 \dots\dots + y_{n-1})]$ $A = \frac{0.5}{2}\{((16.5 + 0) + 2(7.361 + 4 + 2.31 + 1.278 + 0.556)\}$ $= 11.88 \text{units}^2$	MS (0, 3, 5) PC for any correct substitution into formula **Incorrect rounding and/or no units = 4 marks**
(c)	$\int_1^4 \frac{16}{x^2} - \frac{x}{2} + 1\ dx$ $\int_1^4 16x^{-2} - \frac{1}{2}x + 1\ dx$ $\left[\frac{16x^{-1}}{-1} - \frac{\frac{1}{2}x^2}{2} + x\right]$ $= \left[-\frac{16}{x} - \frac{x^2}{4} + x\right]$ $= [-4 - 4 + 4] - \left[-16 - \frac{1}{4} + 1\right]$ $= 11\frac{1}{4} = \frac{45}{4} \text{ units}^2$	MS (0, 5, 8, 10) LPC: Some correct integration OR correct substitution into incorrect integral HPC: Fully correct integral OR correct substitution into incorrect integral with some correct integration **No units = 9 marks**
(d)	$\%\ error = \left(\frac{\lvert approx - exact \rvert}{exact}\right) \times 100$ $\%\ error = \left(\frac{11.88 - 11.25}{11.25}\right)$ $= 5.6\%$	MS (0, 3, 5) PC: Some correct substitution % sign not needed for full credit