

## 2. Approximation of area

$$1 \quad h = \frac{3 - (-1)}{5} = \frac{4}{5} = 0.8$$

|   |    |      |      |      |      |   |
|---|----|------|------|------|------|---|
| x | -1 | -0.2 | 0.6  | 1.4  | 2.2  | 3 |
| y | 5  | 7.56 | 8.84 | 8.84 | 7.56 | 5 |

$$A = 0.8(5 + 5) + 2(7.56 + 8.84 + 8.84 + 7.56)$$

$$\begin{aligned} &= 0.8(10 + 2)(32.8) \\ &= 0.8 \times 75.6 \\ &= 30.24 \text{ sq. units} \end{aligned}$$

$$2. \quad y_0 = 0$$

$$y_1 = 2.5$$

$$y_2 = 6$$

$$y_3 = 10.5$$

$$y_4 = 16$$

$$y_5 = 22.5$$

$$y_6 = 30$$

$$A = \frac{1}{2} \times 1(0+30) + 2(2.5 + 6 + 10.5 + 16 + 22.5)$$

$$= \frac{1}{2} \times 145 = 72.5$$

$$(b) \quad \frac{1}{2}x^2 - 2 = \frac{x^3}{6} - x$$

$$= \frac{8^3}{6} - 8 - \frac{2^3}{6} - 2$$

$$= 77.33 - 0.67$$

$$= 78 \text{ square units}$$

$$(c) \% \text{ error} = \frac{72.5 - 78}{78} \times 100$$

$$= -7.05\%$$

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$$(c) \% \text{ error} = \frac{72.5 - 78}{78} \times 100$$

$$= -7.05\%$$

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