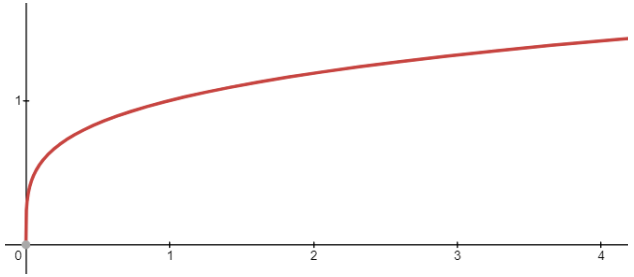
11.12) Integration as the limit of a sum

Worked example

The diagram shows a sketch of the curve with equation $y = \sqrt[4]{x}, x > 0$.



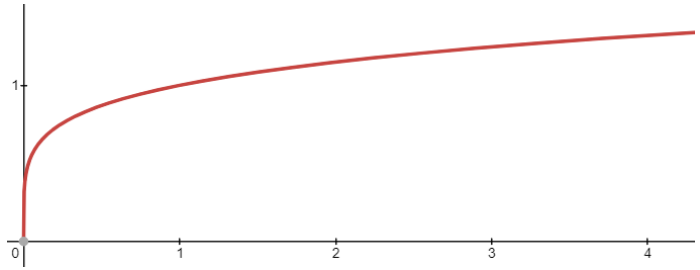
The area under the curve may be thought of as a series of thin strips of height y and width δx.

Calculate to 4 significant figures:

$$\lim_{\delta x \to 0} \sum_{2}^{3} \sqrt[4]{x}\, \delta x$$

Your turn

The diagram shows a sketch of the curve with equation $y = \sqrt[5]{x}, x > 0$.



The area under the curve may be thought of as a series of thin strips of height y and width δx.

Calculate to 4 significant figures:

$$\lim_{\delta x \to 0} \sum_{3}^{4} \sqrt[5]{x}\, \delta x$$

1.284

Worked example

Calculate to four significant figures:

$$\lim_{\delta x \to 0} \sum_{5}^{6} \cos x \, \delta x$$

Your turn

Calculate to four significant figures:

$$\lim_{\delta x \to 0} \sum_{1}^{2} \sin x \, \delta x$$

0.9564