

Integration

Exercise 3.1 Differentials

1. Find δx and dy in the following cases
 - (i) $y = x^2 - 1$
 - (ii) $y = x^2 + 2x$
 - (iii) $y = \sqrt{x}$

2. Using differentials find $\frac{dy}{dx}$ and $\frac{dx}{dy}$ in the following equations.
 - (i) $xy + x = 4$
 - (ii) $x^2 + 2y^2 = 16$
 - (iii) $x^4 + y^2 = xy^2$
 - (iv) $xy - \ln x = c$

3. Use differentials to approximate the values of
 - (i) $\sqrt[4]{17}$
 - (ii) $(8.02)^{\frac{1}{3}}$
 - (iii) $31^{\frac{1}{5}}$
 - (iv) $\cos 29^\circ$
 - (v) $\sin 61^\circ$

4. Find the approximate increase in the volume of a cube if the length of its each edge changes from 5 to 5.02.

5. Find the approximate increase in the area of circular disc if its diameter is increased from 44cm to 44.4cm.