

### EXERCISE 7.13

Answer questions (1 to 4) :

Evaluate the following (1 to 4) integrals :

1. (i)  $\int \sqrt{x^2 + 4x + 6} \, dx$

(ii)  $\int \sqrt{5 - 2x + x^2} \, dx$  (Exemplar)

2. (i)  $\int \sqrt{3 - 2x - x^2} \, dx$

(ii)  $\int \sqrt{1 + 3x - x^2} \, dx$

3. (i)  $\int (x + 3) \sqrt{3 - 4x - x^2} \, dx$

(ii)  $\int (2x + 3) \sqrt{4x^2 + 5x + 6} \, dx$

(CBSE 2016, 15)

4.  $\int (3x + 1) \sqrt{4 - 3x - 2x^2} \, dx$

(CBSE 2016)

### ANSWERS

1. (i)  $\frac{1}{2} (x + 2) \sqrt{x^2 + 4x + 6} + \log |x + 2 + \sqrt{x^2 + 4x + 6}| + C$

(ii)  $\frac{1}{2} (x - 1) \sqrt{5 - 2x + x^2} + 2 \log |x - 1 + \sqrt{5 - 2x + x^2}| + C$

2. (i)  $\frac{1}{2} (x + 1) \sqrt{3 - 2x - x^2} + 2 \sin^{-1} \left( \frac{x + 1}{2} \right) + C$

(ii)  $\frac{1}{4} (2x - 3) \sqrt{1 + 3x - x^2} + \frac{13}{8} \sin^{-1} \left( \frac{2x - 3}{\sqrt{13}} \right) + C$

3. (i)  $-\frac{1}{3} (3 - 4x - x^2)^{3/2} + \frac{1}{2} (x + 2) \sqrt{3 - 4x - x^2} + \frac{7}{2} \sin^{-1} \left( \frac{x + 2}{\sqrt{7}} \right) + C$

(ii)  $\frac{1}{6} (4x^2 + 5x + 6)^{3/2} + \frac{7}{32} (8x + 5) \sqrt{4x^2 + 5x + 6} + \frac{497}{256} \log \left| x + \frac{5}{8} + \sqrt{x^2 + \frac{5}{4}x + \frac{3}{2}} \right| + C$

4.  $-\frac{1}{2} (4 - 3x - 2x^2)^{3/2} - \frac{5}{32} (4x + 3) \sqrt{4 - 3x - 2x^2} - \frac{205\sqrt{2}}{128} \sin^{-1} \left( \frac{4x + 3}{\sqrt{41}} \right) + C$

### 7.7 DEFINITE INTEGRAL AS THE LIMIT OF A SUM

interval  $[a, b]$  and (without loss of