

U. V. Patel College of Engineering
B. Tech. Semester - I (All Branches)
Subject: 2BS101 Mathematics-I
TUTORIAL - 2 (Unit-3)

Example:

Evaluate following integrals in terms of Beta function.

$$(1) \int_0^1 x^3 (1 - \sqrt{x})^5 dx \quad \left[\frac{1}{5148} \right]$$

$$(2) \int_0^1 \sqrt{1 - x^4} dx \quad \left[\frac{1}{4} B \left(\frac{3}{2}, \frac{1}{4} \right) \right]$$

$$(3) \int_0^1 \sqrt{1 - x^m} dx \quad \left[\frac{1}{m} B \left(\frac{1}{m}, \frac{3}{2} \right) \right]$$

$$(4) \int_0^1 \frac{dx}{\sqrt{1 - x^6}} \quad \left[\frac{1}{8} B \left(\frac{1}{8}, \frac{1}{2} \right) \right]$$

$$(5) \int_0^{\pi/2} \sqrt{\cot \theta} d\theta \quad \left[\frac{1}{2} B \left(\frac{3}{4}, \frac{1}{4} \right) \right]$$

Example:

Find the value of following

$$(1) B \left(\frac{3}{2}, \frac{1}{2} \right) \quad (2) B \left(\frac{5}{2}, \frac{3}{2} \right) \quad \left[\frac{\pi}{2}, \frac{\pi}{16} \right]$$

Example:

If $B(n, 3) = \frac{1}{60}$ and n is a positive integer then find the value of n .

Answer: $[n = 4]$