

215. Moment of inertia of a right circular cylinder about a line tangent to its base.

216. Moment of inertia of a segment cut from a sphere by a plane, about a diameter parallel to that plane.

217. Center of gravity of a right circular cone whose density varies as the distance from the center of the base.

218. Volume bounded by the xy -plane, the cylinder $x^2 + y^2 = 2ax$ and the cone $z^2 = x^2 + y^2$.

219. Find the attraction of a uniform wire of length l and mass M on a particle of unit mass at distance c from the wire in the perpendicular at one end.

220. Find the attraction of a right circular cylinder on a particle at the middle of its base.

221. Show that the attraction of a homogeneous shell bounded by two concentric spherical surfaces on a particle in the enclosed space is zero.

CHAPTER X

Solve the following differential equations:

222. $y dx + (x - xy) dy = 0$.

223. $\sin x \sin y dx + \cos x \cos y dy = 0$.

224. $(2xy - y^2 + 6x^2) dx + (3y^2 + x^2 - 2xy) dy = 0$.

225. $x \frac{dy}{dx} + y = x^3y$.

226. $x \frac{dy}{dx} + y = \cot x$.

227. $x dy - \left(y + e^{\frac{1}{x}} \right) dx = 0$.

228. $(1 + x^2) dy + (xy + x) dx = 0$.

229. $x dx + y dy = x dy - y dx$.

230. $(\sin x + y) dy + (y \cos x - x^2) dx = 0$.

231. $y(e^x + 2) dx + (e^x + 2x) dy = 0$.

232. $(xy^2 - x) dx + (y + xy) dy = 0$.

233. $(1 + x^2) \frac{dy}{dx} + xy = 2y$.

234. $x dy - y dx = \sqrt{x^2 + y^2} dx$.

235. $(x - y) dx + x dy = 0$.

236. $x dy - y dx = x \sqrt{x^2 + y^2} dx$.

237. $e^{x+y} dy + (1 + e^y) dx = 0$.

238. $(2x + 3y - 1) dx + (4x + 6y - 5) dy = 0$.

239. $(3y^2 + 3xy + x^2) dx = (x^2 + 2xy) dy$.

240. $(1 + x^2) dy + (xy - x^2) dx = 0$.