

MATH 171

Multidimensional Mathematics

Calculus, Eighth Edition, James Stewart, 2016, 2012 Cengage Learning, ISBN: 978-1-285-74062-1.

Math 171 Basic Linear Algebra, <http://www.math.iupui.edu/~kitchens/LinAlg.pdf>

Syllabus

1. Geometry of \mathbb{R}^2
 - (a) parametric equations (section 10.1)
 - (b) polar coordinates (section 10.3)
 - (c) conic sections (section 10.5)
 - (d) complex numbers (appendix G)
2. \mathbb{R}^3 and vectors
 - (a) cartesian coordinates for \mathbb{R}^3 (section 12.1)
 - (b) vectors (section 12.2)
 - (c) dot product (section 12.3)
 - (d) cross product (section 12.4)
 - (e) lines and planes (section 12.5)
3. Geometry of \mathbb{R}^3
 - (a) curves in \mathbb{R}^3 (section 13.1)
 - (b) quadric surfaces (section 12.6)
 - (c) functions of 2 variables and graphs (section 14.1)
 - (d) cylindrical coordinates (section 15.7)
 - (e) spherical coordinates (section 15.8)
 - (f) parametric equations of surfaces (section 16.6)
4. Linear algebra
 - (a) lines, planes and systems of linear equations
 - (b) matrices and elementary row operations
 - (c) Gaussian elimination
 - (d) reduced row-echelon matrices and solution sets
 - (e) matrix arithmetic
 - (f) the multiplicative identity and inverse matrices
 - (g) determinants
 - (h) functions
 - (i) eigenvalues and eigenvectors
 - (j) complex eigenvalues and eigenvectors