MATH 311 | Topics in Applied Mathematics I | Spring 2015
Sections 502,503 | Linear Algebra and Vector Analysis | P. Yasskin

Homework

Due Dates:

- 1/28: HW 1: 1.1, 1.2A
- 2/4: HW 2: 1.3, 1.4, 1.5, 1.2B
- 2/11: HW 3: 2.1,2.2
- 2/17: THQ 1
- 2/18: HW 4: 3.1
- 2/19: Exam 1.
- 3/4: HW 5: 3.2, 3.3, 3.4
- 3/11: HW 6: 3.5, 3.6, 4.1
- 3/25: HW 7: 4.2, 4.3, 5.1
- 4/1: HW 8: 5.4, 5.5, 5.6
- 4/2: THQ 2
- 4/7: Exam 2.
- 4/15: HW 9: 6.1, 6.3
- 4/16: THQ 3 (To be handed out in class.)
- 4/22: HW :
- 4/29: HW :

Assignments: (Underlined are the most important.)

- Section 1.1 – p. 10: # 6e, 6h, 7, **8**(Use reduced row echelon form from Sec 1.2 instead of back substitution.), 9
- Section 1.2A – p. 23: # 5a, **5e**, **5f**, **5i**, **5j**, 6b, 7, 8, **10**
- Section 1.3 – p. 42: # 1d, 1e, 1f, 1g, 1h, 2, 3, 4b, 8, **9**, **10ab**
- Section 1.4 – p. 56: # **1**, 4, 5, **6**, 11acd, 13c, **16**, 17, **20**, 23, 24c, **27**
- Section 1.5 – p. 66: (See the bottom of p 62 through the top of p 64.) #10b, **10c**, 10f, **10g**, **9**, **12a**, **12d**
- Section 1.2B – p. 23: # **15**, 19, **22c**
- Section 2.1 – p. 94: # 3b, 3f, **3h**, 4bcd, 6, 9, 11
- Section 2.2 – p. 101: # **2**, 4, 6, 7, **10**, 12
- Section 2.3 – p. 109: # **1c**, 2b, 5, 9
- Section 3.1 – p. 122: # 5, 8, **9**, 11, **12**, 14
- Section 3.2 – p. 131: # 1, 3bcdef, 4ab, **5bc**, 6abc, 6de, **8**, **13**, 14, 16, 19, **22**

- Section 3.3 – p. 143: # **2bce**, **3bce**, 5, 7, **8ac**, 16, 17
- Section 3.4 – p. 149: # 2bce, **5**, 9, 11, 12, **13**, 16
- Section 3.5 – p. 159: # 1ab, 3ab, **5**, **9**(and express $3x + 2$ in the $[2x - 1, 2x + 1]$ basis.)
- Section 3.6 – p. 165: # 1b, **3**, 4ad, **8**, **13**, **18**, 22a, 26
- Section 4.1 – p. 182: # 1, 4(HINT: Write $(7, 5)$ as a linear combination of $(1, 2)$ and $(1, -1)$.), 5, 8, 11, **13**, 17, **19**, **21**, **22**, 23, 25
- Section 4.2 – p. 195: # 4, 6, **8**, 13, **14**, **18**(HINT: First find the matrix relative to the standard bases for $\mathbb{R}^3$ and $\mathbb{R}^2$. Then multiply on the left and right by appropriate change of basis matrices.), 20
- Section 4.3 – p. 202: # 2ab, 3, 5abc, **6**, 7, 9, 11, 13, **15**(HINT: Use the formulas: $tr(A) = \sum_{i=1}^{n} A^i{}_i$ and $(AB)^i{}_j = \sum_{k=1}^{n} A^i{}_k B^k{}_j$.)
- Section 5.1 – p. 224: # 1bd, 2bd, 3bd, **13**, **17**, **18**
- Section 5.4 – p. 251: # 3, **7ac**, **8**, 10, 11, **26**, **9**(HINT: There is a trig identity for $\sin A \cos B$ in terms of $\sin(A + B)$ and $\sin(A - B)$.)
- Section 5.5 – p. 269: # **2**, 4, 6, **9**
- Section 5.6 – p. 280: # **3**, 4, **Extra**: Find an orthonormal basis for P_3 with the inner product $(p, q) = \int_0^1 x\, p(x)\, q(x)\, dx$ by applying the Gram-Schmidt procedure to $1, x, x^2$.
- Section 6.1 – p. 308: # **1acdghijl**(Please list your eigenvalues in ascending order.), 3, **4**, 7, 9, 10, **14**, 28, 33
- Section 6.3 – p. 336: # **1abcde**(Please list your eigenvalues in ascending order.), **2abcde**, **3abcde**(if invertible), **4**(Do b before a.), 5, **18**(Also: How are the eigenvalues and eigenvectors of B expressed in terms of those for A?), **29**