

**Math 309 Midterm, due Oct 21, 2009**

(1) Section 2.5, #6, p149. (10 points)

(2) Section 2.9, # 14, p181. (10 points)

(3) Section 2.9, #22, p182. (10 points)

(Hint: Let  $\{w_1, w_2, w_3, w_4\}$  form a basis of  $\text{Span}(v_1, \dots, v_5)$ . Write  $v_1, \dots, v_5$  as linear combinations of  $w_1, \dots, w_4$ . Explain why one can find constants  $c_1, \dots, c_5$  such that  $c_1v_1 + \dots + c_5v_5 = 0$  by reducing it to a matrix problem.)

(4) Section 3.2, # 10, p199. (10 points)

(5) Section 3.3, #12, p210. (10 points)

(6) Section 3.3, # 30, p210. (10 points)

(7) # 10, p212. (10 points)

(8) # 16, p212. (10 points for each part)