

Math 251
Assignment 2

Deadline: Wed Feb 24, 2:30pm Pacific Time
Submit on D2L

Number of Questions: 3
Total Marks: 10 marks

Show all your work for full marks.

You MAY use the course website (notes, videos etc) and your own notes

You may NOT copy from others (classmates, tutors, Chegg etc)

Submit jpg or pdf files

Feel free to handwrite your solutions and take photos of your work

Covers Sections 2.3-3.2

1. [2 marks] Set up but DO NOT SOLVE a system of equations.

A mining company operates three different mines. Each week, Mine A produces 12 tons of anthracite (hard coal), 20 tons of ordinary coal and 3 tons of bituminous (soft) coal. Each week, Mine B produces 5 tons of anthracite, 4 tons of ordinary coal and 2 tons of bituminous coal. Each week, Mine C produces 7 tons of anthracite, 9 tons of ordinary coal and 8 tons of bituminous coal. For how many weeks must each of the three mines be operated to produce a total of 69 tons of anthracite, 100 tons of ordinary coal and 43 tons of bituminous coal?

2. [4 marks] Are the following vectors linearly independent or linearly dependent? Show all your work.

$$\mathbf{u}_1 = [1, 2, 3], \mathbf{u}_2 = [-1, 1, 1] \text{ and } \mathbf{u}_3 = [1, 1, 2]$$

3. [4 marks] Find the general form of the span of $\begin{bmatrix} 1 & 4 \\ 3 & 6 \end{bmatrix}$ and $\begin{bmatrix} 2 & 8 \\ 7 & 14 \end{bmatrix}$