MATH 240 Assignment 2, Spring 2016

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Please put your name and student ID at the top of the front page and staple your assignment together.
Please hand in to the dropoff boxes outside AQ 4135 by 6pm Tuesday February 2nd.
Sorry, no late assignments are accepted.
Also, the second quiz is on Wednesday February 3rd at the beginning of class.

1.7 Exercises 2, 16, 18, 21, 30, 36.

1.8 Exercises 8, 9, 16, 17, 21.

1.9 Exercises 2, 10, 18, 22, 23, 26.

2.1 Exercises 2, 6, 12, 15, 20.

Let A, B, C be m by n matrices. Show that $A + (B + C) = (A + B) + C$. Depending on how you do the proof, you will need some notation to refer to either the columns of the matrices or the individual entries in the matrices. Use $A_{i,j}$ to denote the entry in the $i'th$ row and $j'th$ column of the matrix A. This notation is standard.

2.2 Exercises 7, 9, 14, 15, 16, 17.

Find the inverse of the matrix $A = \begin{bmatrix} 1 & 0 & 2 \\ 0 & 1 & 0 \\ 2 & 0 & 5 \end{bmatrix}$ by row reducing the book keeping matrix $[A|I]$ to reduced row echelon form. Verify that your answer is correct. See example 7 on page 110.

2.3 Exercises 4, 8, 11, 15, 20, 23, 28.

Let u, v and w be vectors in $\mathbb{R}^n$. Here is my proof that $u + (v + w) = u + (v + w)$.

$$\begin{aligned}
u + (v + w) &= u + (\,[v_1, \ldots, v_n] + [w_1, \ldots, w_n]\,) \\
&= [u_1, \ldots, u_n] + [v_1 + w_1, \ldots, v_n + w_n] && \text{by definition of vector } + \\
&= [u_1 + (v_1 + w_1), \ldots, u_n + (v_n + w_n)] && \text{by definition of vector } + \\
&= [(u_1 + v_1) + w_1, \ldots, (u_n + v_n) + w_n] && + \text{ in } \mathbb{R} \text{ is associative} \\
&= [u_1 + v_1, \ldots, u_n + v_n] + [w_1, \ldots, w_n] && \text{by definition of vector } + \\
&= (\,[u_1, \ldots, u_n] + [v_1, \ldots, v_n]\,) + w && \text{by definition of vector } + \\
&= (u + v) + w
\end{aligned}$$