22A Homework 6

Due Friday May 11, 5pm Wellman Boxes

KOHI ≡ Kolman/Hill, Edition 8, "Introductory Linear Algebra"

Question 1 Let \vec{u} and \vec{v} be vectors in \mathbb{R}^n . Prove the triangle inequality

 $|\vec{u} + \vec{v}| \le |\vec{u}| + |\vec{v}|.$

Under what conditions can you replace the inequality with an equals sign? (Draw a picture.)

Question 2 Let $L : \mathbb{R}^n \to \mathbb{R}^m$ be a linear transformation. Show that there is a unique $m \times n$ matrix A so that

$$L(\vec{u}) = A\vec{u}, \qquad \forall \vec{u} \in \mathbb{R}^n.$$

(Hint: this result is discussed in KOHI 4.2, but you will need to put together several smaller results to produce an argument in your own words.)

Question 3 KOHI 4.2, pp 224-245, qq 2, 8, 12, 14, 16, 20, 22, 26, 30, 32, 34, 36.

Question 4 KOHI 4.2, pp 245-246, qq T2, T6, T8, T12, T13.

Question 5 KOHI 4.3, pp 255-256, qq 2, 4, 6, 8, 10, 14, 16, 18, 22, 26.

Question 6 KOHI 4.3, p 256, qq T4, T6, T8, T10.

Question 7 KOHI p 257-258, qq 2, 4, 8, 12, 14, 22, 24.

Question 8 KOHI p 258, qq T4, T6.

Question 9 KOHI p 258, q C6.