

Answers for the sample problems for Test II

1. (a) $A = \begin{pmatrix} 0 & 0 & 2 \\ 0 & 1 & 0 \\ 0 & 0 & 2 \end{pmatrix}$

(b) $B = \begin{pmatrix} 0 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 2 \end{pmatrix}$

(c) $S = \begin{pmatrix} 1 & 0 & 1 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{pmatrix}$

2. $\frac{8}{7}$.

3. (a) $u_1 = \left(\frac{1}{2}, \frac{1}{2}, \frac{1}{2}, \frac{1}{2}\right)$, $u_2 = \left(0, -\frac{1}{\sqrt{6}}, \frac{2}{\sqrt{6}}, -\frac{1}{\sqrt{6}}\right)$

(b) $u_3 = \left(0, -\frac{1}{\sqrt{2}}, 0, \frac{1}{\sqrt{2}}\right)$, $u_4 = \left(-\frac{\sqrt{3}}{2}, \frac{1}{2\sqrt{3}}, \frac{1}{2\sqrt{3}}, \frac{1}{2\sqrt{3}}\right)$

4. $\|x\|_1 = 8$, $\|x\|_2 = \sqrt{26}$, $\|x\|_\infty = 4$

5. $f(x) = \frac{3}{5} + 2x$

6. $\mathbf{p} = \left(-\frac{7}{3}, \frac{4}{3}, \frac{11}{3}\right)$