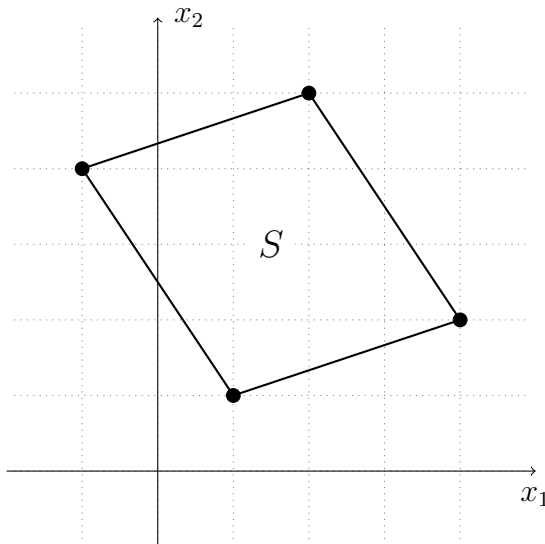


This is a two-stage quiz. You will receive this back with each question graded pass/fail in our next class meeting. You have until the date specified above to submit corrections for partial credit.

1. (5 points) Consider the parallelogram S plotted below with vertices $(1,1)$, $(-1,4)$, $(2,5)$, and $(4,2)$.



- (i) (3 points) Find the area of S .

- (ii) (2 points) Define a linear transformation $T : \mathbb{R}^2 \rightarrow \mathbb{R}^2$ by $T(\mathbf{x}) = A\mathbf{x}$ where

$$A = \begin{bmatrix} 1 & 4 \\ 1 & 2 \end{bmatrix}.$$

Compute the area of the parallelogram $T(S)$, the image of S under T .

2. (5 points) Consider the vector space \mathbb{P}_2 (the space of polynomials of degree at most 2). Three vectors in this space are

$$p_1(t) = 1 + x$$

$$p_2(t) = 1 - x$$

$$p_3(t) = 3x^2 - 1.$$

Give 5 vectors from \mathbb{P}_2 that are elements of $\text{Span}\{p_1(t), p_2(t), p_3(t)\}$.