

Name:

Problem 1: Consider the map

$$f: \mathcal{P}_1 \rightarrow \mathbb{R}^2$$

given by

$$f(a + bx) = \begin{pmatrix} a - b \\ b \end{pmatrix}.$$

Find the image of each of the following elements:

a) $3 - 2x$

Here $a = 3$ and $b = -2$, so

$$f(3 - 2x) = \begin{pmatrix} 5 \\ -2 \end{pmatrix}$$

b) $2 + 2x$

Here $a = 2$ and $b = 2$, so

$$f(2 + 2x) = \begin{pmatrix} 0 \\ 2 \end{pmatrix}$$

c) x

Here $a = 0$ and $b = 1$, so

$$f(x) = \begin{pmatrix} -1 \\ 1 \end{pmatrix}$$