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## MATH 22 LECTURE 07 CLASSWORK: STANDARD MATRIX

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For each described operation, find the standard matrix  $A$  and determine if  $T$  is onto and/or one-to-one.

(1) Let  $T : \mathbb{R}^n \rightarrow \mathbb{R}^m$  be defined by  $T(x_1, x_2) = (3x_1, -2x_1 + x_2, -x_2)$ .

- (a) What is  $n$ ?
- (b) What is  $m$ ?
- (c) What is  $A$ ?

(d) Is  $T$  onto?

(e) Is  $T$  one-to-one?

(2) Let  $T : \mathbb{R}^2 \rightarrow \mathbb{R}^2$  be reflection about the line  $x_2 = x_1$ .

(a) What is  $A$ ?

(b) Is  $T$  onto?

(c) Is  $T$  one-to-one?

(3) Let  $T : \mathbb{R}^3 \rightarrow \mathbb{R}^2$  be defined by  $(x_1, x_2, x_3) \mapsto (x_1, x_2)$ .

(a) What is  $A$ ?

(b) Is  $T$  onto?

(c) Is  $T$  one-to-one?