General Stuff

- Lab 1 today after Discussion 12:20 - 1:10
- Quiz today at 11:45

  15 minutes to do the quiz

  5 minutes to upload
- Any questions on quiz material (1.3)?

  Cross products

  Determinants

  Finding equations of planes

  Parametrizations of lines or planes

Review

- Equation for minimum distance from a point (x_1, y_1, z_1) to a plane $ax + by + cz = d$.

$$\text{dist} = \frac{ax_1 + by_1 + cz_1 + d}{\sqrt{a^2 + b^2 + c^2}}.$$

- Vector properties of $\mathbb{R}^n$

  dot product

  magnitude

  vector addition and scalar multiplication

  Matrix multiplication

1. Find the minimum distance from the point $p = (-1, 2, 0)$ to the plane $x - y + 2z = 3$.

2. Let

$$A = \begin{pmatrix} 2 & -1 \\ 0 & 3 \\ 1 & 2 \end{pmatrix} \quad B = \begin{pmatrix} -6 & 1 \\ 4 & 0 \end{pmatrix} \quad v = \begin{pmatrix} -1 \\ 1 \\ 3 \end{pmatrix}.$$

Find which combinations of A, B, and v can be multiplied and evaluate them.

We usually denote functions with arrows. The notation

$$T : \mathbb{R}^n \to \mathbb{R}^m$$

means the function is called T, the domain is $\mathbb{R}^n$, and the codomain is $\mathbb{R}^m$. Multiplying by an $m \times n$ matrix is a function like this. For example...

Functions where you multiply by a matrix are called *linear* transformations because...

Derivatives in multi will be linear transformations. We can already see that a bit using the parametrization of a plane.