1 Matrix

Def- Array of numbers arranged in rows and col's

ex- $A = \begin{vmatrix} 1 & 2 \\ 3 & 4 \end{vmatrix}$

2 Determinant

Def- scalar value determined from square matrix

ex- $\det(A) = (1)(4) - (2)(3) = -2$

3 Vector

Def- Ordered list of numbers that represents a point in space direction

ex- $V = \begin{vmatrix} 1 \\ 2 \\ 3 \end{vmatrix}$

4 linear transformation

Def- Function between vector spaces that preserves vector addition and scalar multiplication

ex- $A = \begin{vmatrix} 1 & 2 \\ 3 & 4 \end{vmatrix}$ is a linear transformation on a vector $V = \begin{vmatrix} x \\ y \end{vmatrix}$ by: $Av = \begin{vmatrix} 1 & 2 \\ 3 & 4 \end{vmatrix} \begin{vmatrix} x \\ y \end{vmatrix} = \begin{vmatrix} x+2y \\ 3x+4y \end{vmatrix}$

5 Dot Product

Def- An operation that returns a scalar from two vectors. If $A = \begin{vmatrix} a_1 \\ a_2 \\ a_3 \end{vmatrix}$ and $b = \begin{vmatrix} b_1 \\ b_2 \\ b_3 \end{vmatrix}$, then dot product is $A \cdot B = a_1 b_1 + a_2 b_2 + a_3 b_3$

ex- if $a = \begin{vmatrix} 1 \\ 2 \\ 3 \end{vmatrix}$ and $b = \begin{vmatrix} 4 \\ 5 \\ 6 \end{vmatrix}$, then:

$a \cdot b = 1(4) + 2(5) + 3(6) = 4 + 10 + 18 = 32$

6 Cross Product
Def- an Operation that returns a vector that is perpendicular to two 3-deimensional vectors.
ex- For $a=\begin{vmatrix} a_1 \\ a_2 \\ a_3 \end{vmatrix}$ and $b=\begin{vmatrix} b_1 \\ b_2 \\ b_3 \end{vmatrix}$, the cross product is
$$a \times b = \begin{vmatrix} a_2 b_3 - a_3 b_2 \\ a_3 b_1 - a_1 b_3 \\ a_1 b_2 - a_2 b_1 \end{vmatrix}$$

7 Eigenvalue
Def- Scalars associated with a square matrix that when multiplied by an eigenvector, produces a scaled version of the original vector
ex- For $A=\begin{vmatrix} 4 & 1 \\ 2 & 3 \end{vmatrix}$, eigenvalues can be computed by solving $\det(A-\lambda I)$ where I is the identity matrix

8 Bezier Curve
Def- Parametric curve that is commonly used in computer graphics. It helps in modeling smooth curves. I don't remember learning this in linear algebra.
ex- A Bezier Curve with points P_0, P_1, P_2 is
$$B(T) = (1-T)^2 P_0 + 2(1-T)T P_1 + T^2 P_2$$