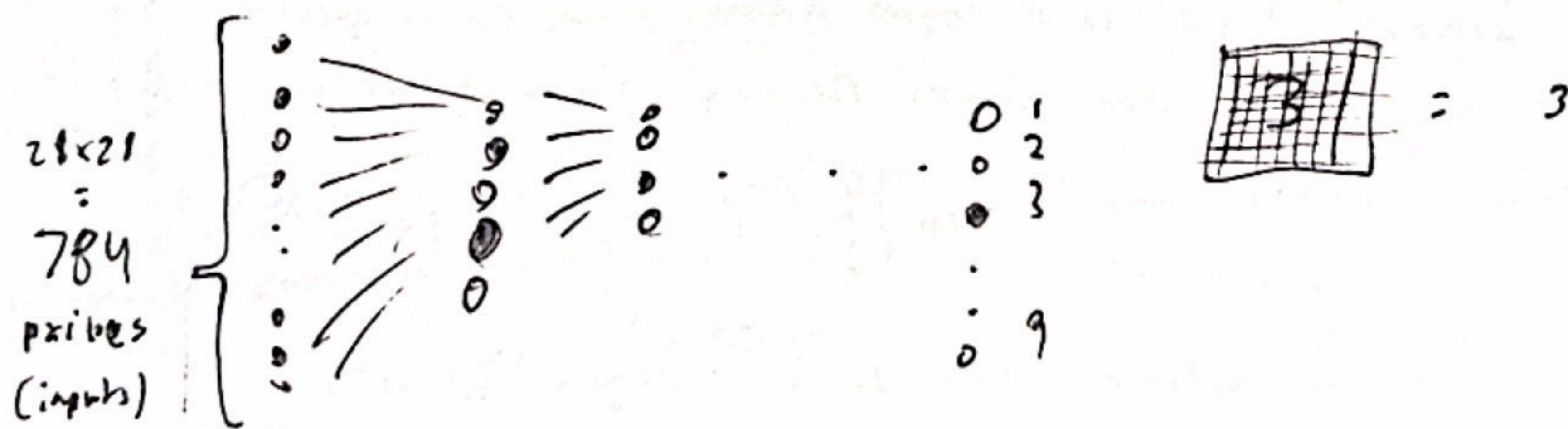# Neural Networks (complete guide)

- inspired by brain as it knows all 3 3 3 are three even though written differently the brain knows so NN are trying to mimic human neurons.

- NN Ex for all Notes: image recognition
  - 29x28 grid of grayscale val (intensity of pixel black to white)

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- NN are part of machine learning, since we cannot explicitly program what a 3 looks like as its not the same when someone writes it again it must be the exact same so not exact pixels lighting up, we must use ML to teach NN (computer) what a 3 is.

28x21
=
784
pxibes
(inputs)

- Variants of NN (NOTE: we talk about plain Vanilla Neural Nets)! Like MLP,
  - Convolutional Neural Network (CNN) → good for img recognition
  - Long short-term memory Network (LSTM) → good for speech recognition
  - Recurrent Neural Network (RNN) → good for sequential data
    ↳ GRU (Gated Recurrent unit) type of RNN
  - Dense Neural Networks (fully connected NN): are NN Where every neuron in one layer is connected to every huron in the next layer