Neurons transmit information electrochemically. When the soma, or cell body, of the neuron switches from being inactive (grey circle) to being active (yellow circle), the neuron transmits a signal down the axon, and then to other neurons at synapses (arrows). These other neurons may or may not become active, depending upon their receptor activation threshold.

A neuron with a positive (white numbered circle) activation threshold needs to receive a signal from a certain number of other neurons for itself to become active. Thus, a neuron with a +1 activation threshold requires at least one active synapse, while a +3 activation threshold requires at least three active synapses.

A neuron with a negative (black numbered circle) activation threshold needs a lack of inhibitor signal from a certain number of other neurons for itself to become active. In other words, it needs a certain number of synaptic connections to inactive neurons to become active. Thus, a neuron with a –1 activation threshold requires at least one inactive synapse, while a –3 activation threshold requires at least three inactive synapses.

The maximum activation threshold (positive or negative) for a neuron is equal to the number of incoming synaptic connections (arrows pointing to it). No neurons have an activation threshold of 0.

In each of these puzzles, you are given a set of neurons in one or more activation states. You need to determine how to assign the available receptor activation thresholds to the neurons in the bottom row so that the neurons behave as given. The same arrangement of activation thresholds must work for every given activation state.