

Neural Networks: Representation

Quiz, 5 questions

✓ **Congratulations! You passed!**

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1.

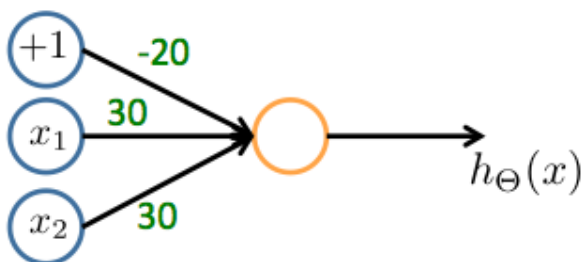
Which of the following statements are true? Check all that apply.



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2.

Consider the following neural network which takes two binary-valued inputs $x_1, x_2 \in \{0, 1\}$ and outputs $h_{\Theta}(x)$. Which of the following logical functions does it (approximately) compute?

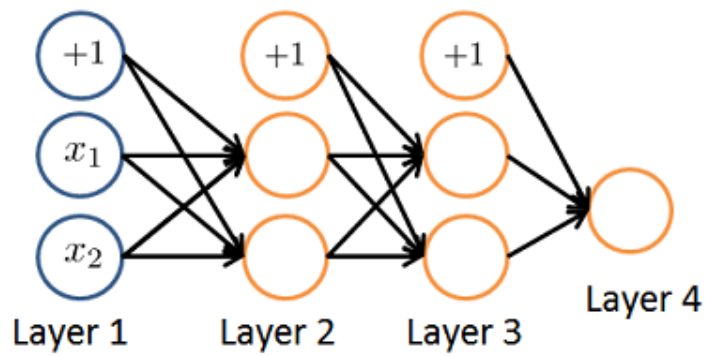


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3.

Consider the neural network given below. Which of the following equations correctly computes the activation a_1 ? Note: $g(z)$ is the Sigmoid activation function.

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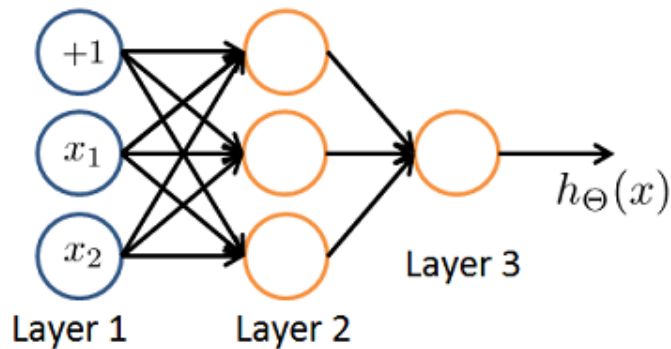
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4.

You have the following neural network:

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You'd like to compute the activations of the hidden layer $a^{(2)} \in \mathbb{R}^3$. One way to do so is the following Octave code:

```
% Theta1 is Theta with superscript "(1)" from lecture
% ie, the matrix of parameters for the mapping from layer 1 (input) to layer 2
% Theta1 has size 3x3
% Assume 'sigmoid' is a built-in function to compute 1 / (1 + exp(-z))

a2 = zeros (3, 1);
for i = 1:3
    for j = 1:3
        a2(i) = a2(i) + x(j) * Theta1(i, j);
    end
    a2(i) = sigmoid (a2(i));
end
```

You want to have a vectorized implementation of this (i.e., one that does not use for loops). Which of the following implementations correctly compute $a^{(2)}$? Check all that apply.



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5.

Neural Networks: Representation

You are using the neural network pictured below and have learned the parameters $\Theta^{(1)} = \begin{bmatrix} 1 & -1.5 & 3.7 \\ 1 & 5.1 & 2.3 \end{bmatrix}$ (used to compute $a^{(2)}$) and $\Theta^{(2)} = \begin{bmatrix} 1 & 0.6 & -0.8 \end{bmatrix}$ (used to compute $a^{(3)}$) as a function of $a^{(2)}$. Suppose you swap the parameters for the first hidden layer between its two units so $\Theta^{(1)} = \begin{bmatrix} 1 & 5.1 & 2.3 \\ 1 & -1.5 & 3.7 \end{bmatrix}$ and also swap the output layer so $\Theta^{(2)} = \begin{bmatrix} 1 & -0.8 & 0.6 \end{bmatrix}$. How will this change the value of the output $h_{\Theta}(x)$?

