1. What does a neuron compute? 1 / 1 point

- A neuron computes the mean of all features before applying the output to an activation function
- A neuron computes an activation function followed by a linear function $z = Wx + b$
- A neuron computes a linear function $z = Wx + b$ followed by an activation function
- A neuron computes a function g that scales the input x linearly (Wx + b)

Expand

Correct

Correct, we generally say that the output of a neuron is a = g(Wx + b) where g is the activation function (sigmoid, tanh, ReLU, ...).

2. Which of these is the "Logistic Loss"? 1 / 1 point

- $\mathcal{L}^{(i)}(\hat{y}^{(i)}, y^{(i)}) = max(0, y^{(i)} - \hat{y}^{(i)})$
- $\mathcal{L}^{(i)}(\hat{y}^{(i)}, y^{(i)}) = \mid y^{(i)} - \hat{y}^{(i)} \mid$
- $\mathcal{L}^{(i)}(\hat{y}^{(i)}, y^{(i)}) = -(y^{(i)} \log(\hat{y}^{(i)}) + (1 - y^{(i)}) \log(1 - \hat{y}^{(i)}))$
- $\mathcal{L}^{(i)}(\hat{y}^{(i)}, y^{(i)}) = \mid y^{(i)} - \hat{y}^{(i)} \mid^2$

Expand

Correct

Correct, this is the logistic loss you've seen in lecture!

3. Suppose x is a (8, 1) array. Which of the following is a valid reshape? 1 / 1 point

- x.reshape(2, 2, 2)

3. Suppose x is a (8, 1) array. Which of the following is a valid reshape? **1 / 1 point**

- (●) x.reshape(2, 2, 2)
- ( ) x.reshape(2, 4, 4)
- ( ) x.reshape(-1, 3)
- ( ) x.reshape(1, 4, 3)

Expand

Correct

Yes. This generates uses 2*2*2 = 8 entries.

4. Consider the following random arrays a and b, and c: **1 / 1 point**

$a = np.random.randn(3, 3)\ \#\ a.shape = (3, 3)$

$b = np.random.randn(2, 1)\ \#\ b.shape = (2, 1)$

$c = a + b$

What will be the shape of c?

- (●) The computation cannot happen because it is not possible to broadcast more than one dimension
- ( ) c.shape = (2, 3, 3)
- ( ) c.shape = (3,3)
- ( ) c.shape = (2, 1)

Expand

Correct

Yes. It is not possible to broadcast together a and b. In this case there is no way to generate copies of one of the arrays to match the size of the other.

5. Consider the two following random arrays a and b: **1 / 1 point**

$a = np.random.randn(4, 3)\ \#\ a.shape = (4, 3)$

$b = np.random.randn(1, 3)\ \#\ b.shape = (1, 3)$

$c = a * b$

What will be the shape of c?

- (●) c.shape = (4, 3)
- ( ) c.shape = (1, 3)
- ( ) The computation cannot happen because it is not possible to broadcast more than one dimension.
- ( ) The computation cannot happen because the sizes don't match.

Expand

Correct
Yes. Broadcasting is invoked, so row b is multiplied element-wise with each row of a to create c.

6. Suppose you have n_x input features per example. Recall that $X = [x^{(1)}x^{(2)}...x^{(m)}]$. What is the dimension of X? **0 / 1 point**

- ( ) $(1, m)$
- (●) (m, n_x)
- ( ) (n_x, m)
- ( ) $(m, 1)$

Expand

Incorrect

7. Consider the following array: 1 / 1 point

$a = np.array([[2, 1], [1, 3]])$

What is the result of $a * a$?

- $\begin{pmatrix} 4 & 1 \\ 1 & 9 \end{pmatrix}$
- $\begin{pmatrix} 5 & 5 \\ 5 & 10 \end{pmatrix}$
- $\begin{pmatrix} 4 & 2 \\ 2 & 6 \end{pmatrix}$
- The computation cannot happen because the sizes don't match. It's going to be an

Expand

Correct
Yes, recall that * indicates element-wise multiplication.

8. Consider the following code snippet: 1 / 1 point

$a.shape = (3, 4)$

$b.shape = (4, 1)$

```
for i in range(3):
 for j in range(4):
 c[i][j] = a[i][j]*b[j]
```

How do you vectorize this?

- c = a*b.T
- c = np.dot(a,b)
- c = a*b
- c = a.T*b

Expand

Correct

Yes. b.T gives a column vector with shape (1, 4). The result of c is equivalent to broadcasting a*b.T.

9. Consider the following arrays: **1 / 1 point**

$a = np.array([[1, 1], [1, -1]])$

$b = np.array([[2], [3]])$

$c = a + b$

Which of the following arrays is stored in c?

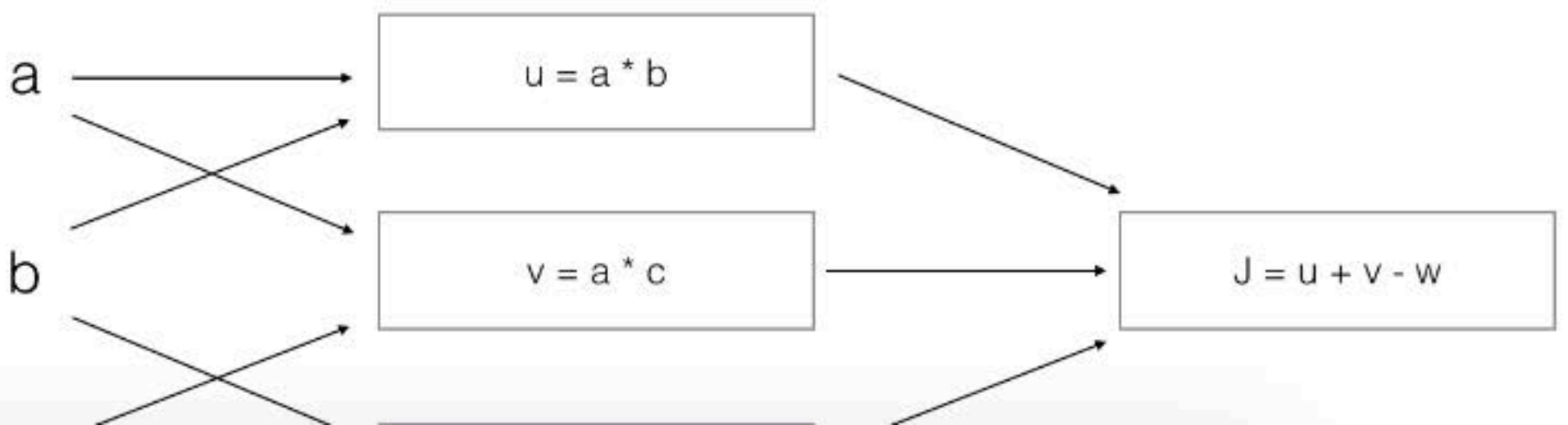
- $\begin{matrix} 3 & 3 \\ 4 & 2 \end{matrix}$
- $\begin{matrix} 3 & 4 \\ 3 & 2 \end{matrix}$
- The computation cannot happen because the sizes don't match. It's going to be an "Error"!
- $\begin{pmatrix} 3 & 3 \end{pmatrix}$

Expand

Correct

Yes. The array b is a column vector. This is copied two times and added to the array a to construct the array c.

10. Consider the following computation graph. **1 / 1 point**



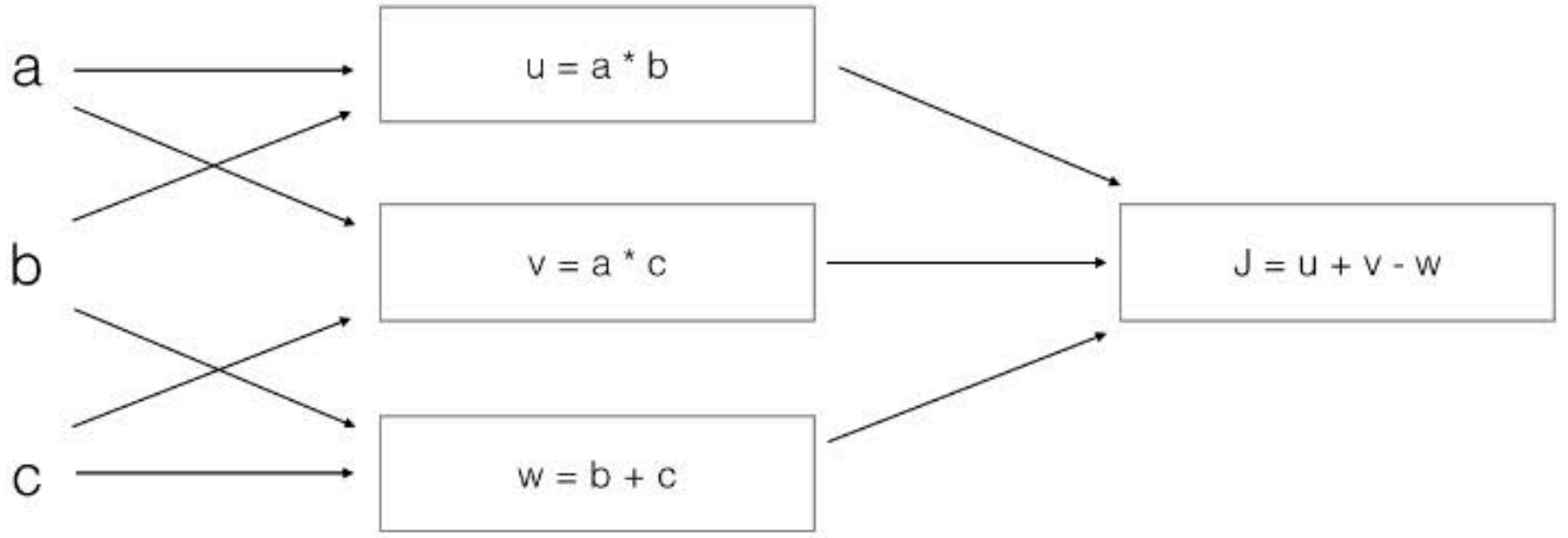
Error.

- $(3 \quad 3)$

Expand

Correct
Yes. The array b is a column vector. This is copied two times and added to the array a to construct the array c.

10. Consider the following computation graph. **1 / 1 point**



What is the output J?

- $J = (a - 1) * (b + c)$
- $J = a * b + b * c + a * c$
- $J = (c - 1) * (b + a)$
- $J = (b - 1) * (c + a)$

Expand

Correct
Yes. $J = u + v - w = a * b + a * c - (b + c) = a * (b + c) - (b + c) = (a - 1) * (b + c)$.