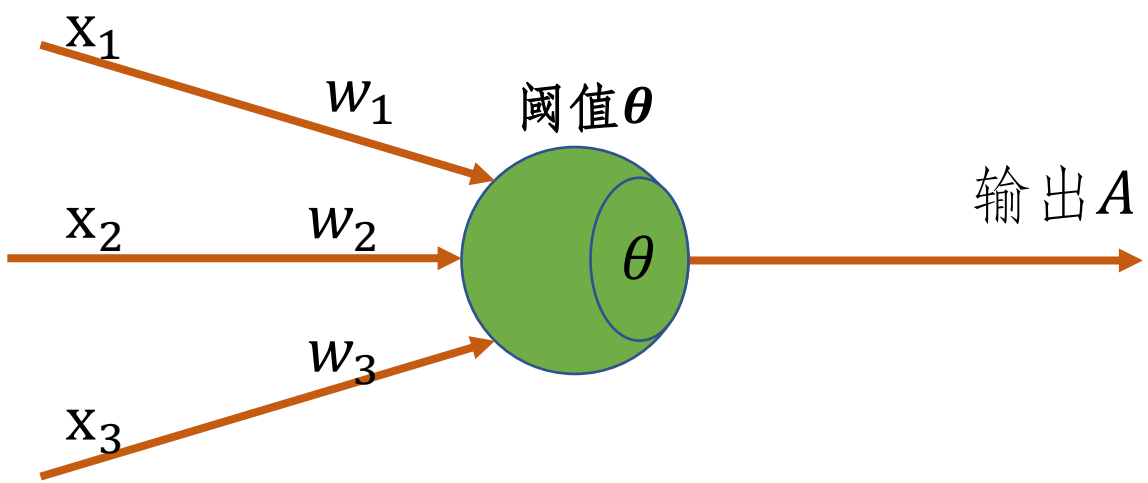
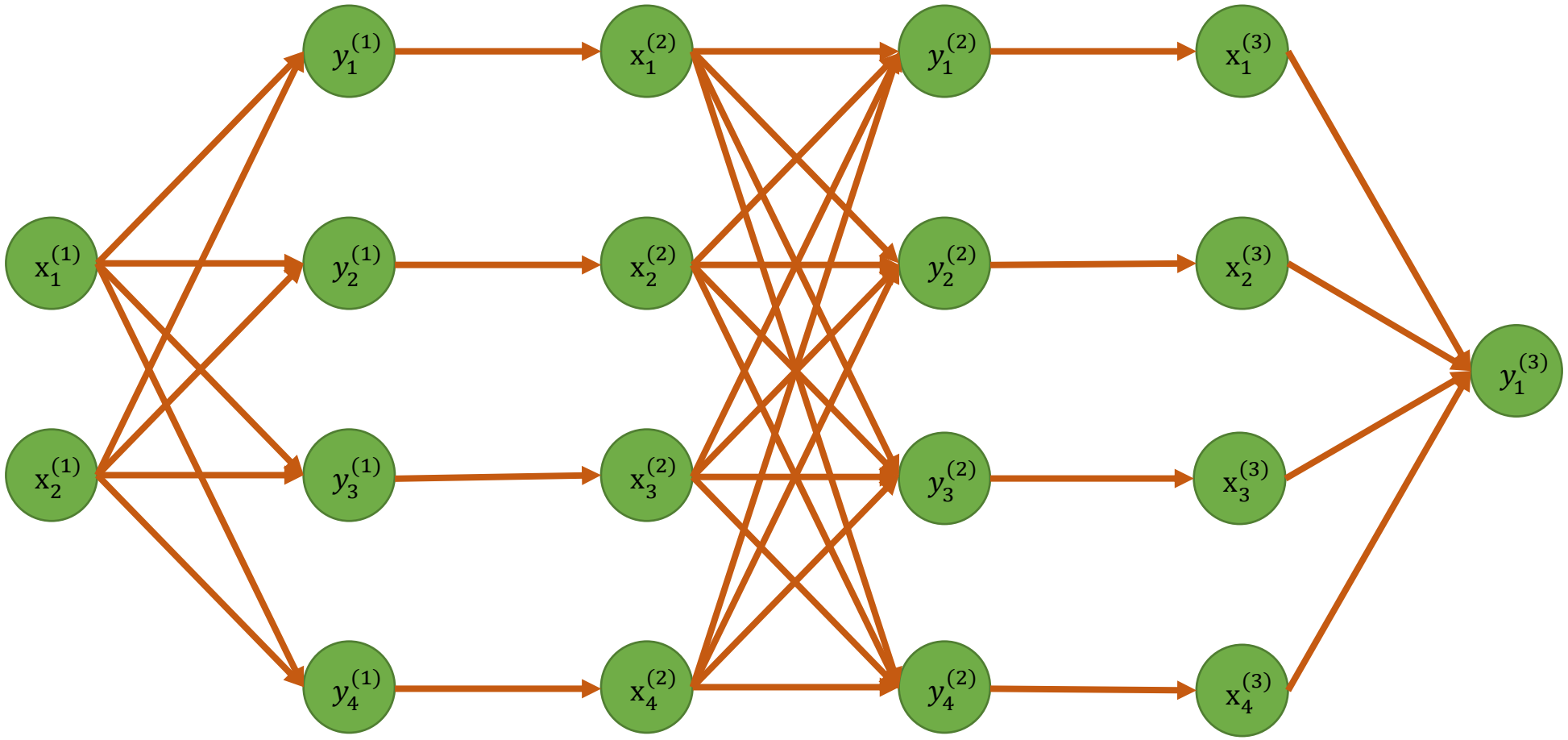
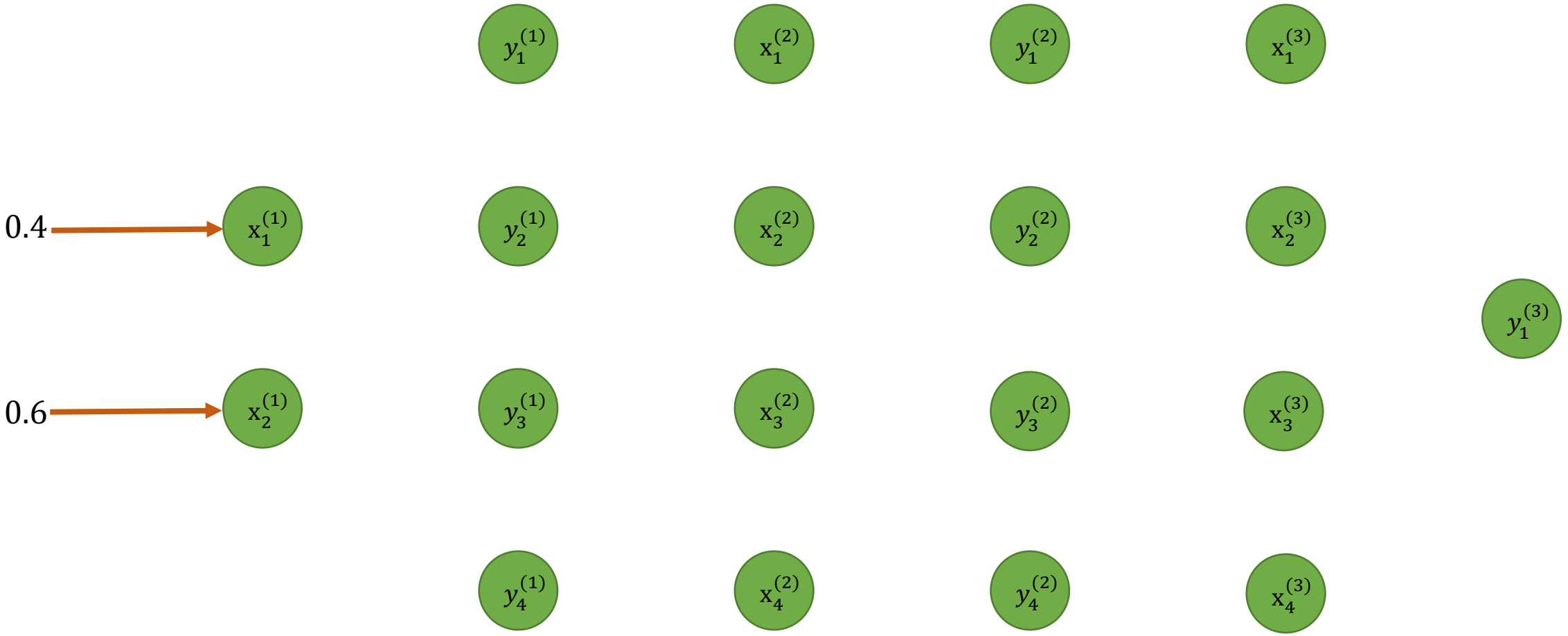


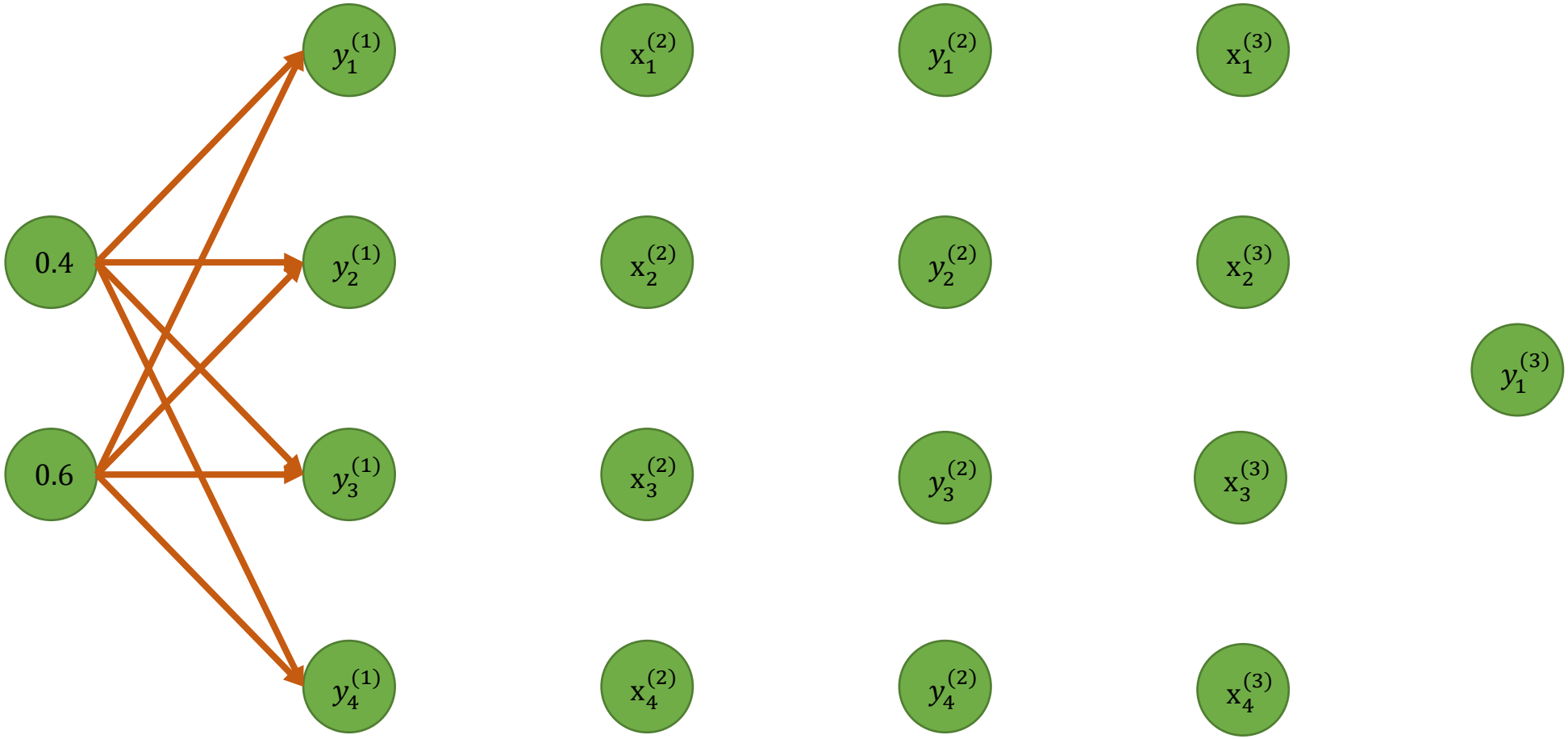
$$A = f(y) = f(w_1x_1 + w_2x_2 + w_3x_3 + \theta)$$

其中$f(\cdot)$为激活函数

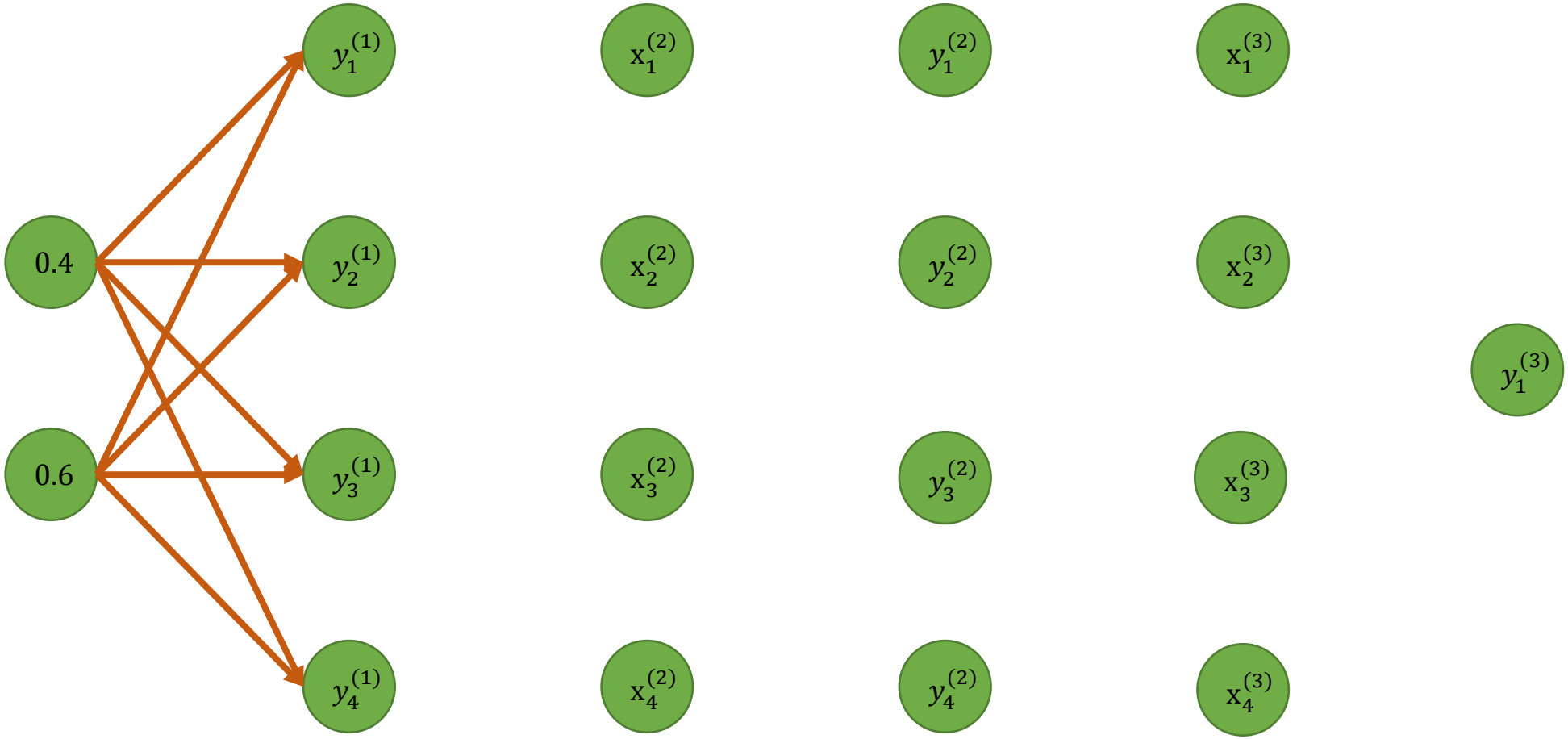

$x_1^{(1)}$
$x_2^{(1)}$
$y_1^{(1)}$
$y_2^{(1)}$
$y_3^{(1)}$
$y_4^{(1)}$
$x_1^{(2)}$
$x_2^{(2)}$
$x_3^{(2)}$
$x_4^{(2)}$
$y_1^{(2)}$
$y_2^{(2)}$
$y_3^{(2)}$
$y_4^{(2)}$
$x_1^{(3)}$
$x_2^{(3)}$
$x_3^{(3)}$
$x_4^{(3)}$
$y_1^{(3)}$


$y_1^{(1)}$
$x_1^{(2)}$
$y_1^{(2)}$
$x_1^{(3)}$
0.4
$x_1^{(1)}$
$y_2^{(1)}$
$x_2^{(2)}$
$y_2^{(2)}$
$x_2^{(3)}$
$y_1^{(3)}$
0.6
$x_2^{(1)}$
$y_3^{(1)}$
$x_3^{(2)}$
$y_3^{(2)}$
$x_3^{(3)}$
$y_4^{(1)}$
$x_4^{(2)}$
$y_4^{(2)}$
$x_4^{(3)}$

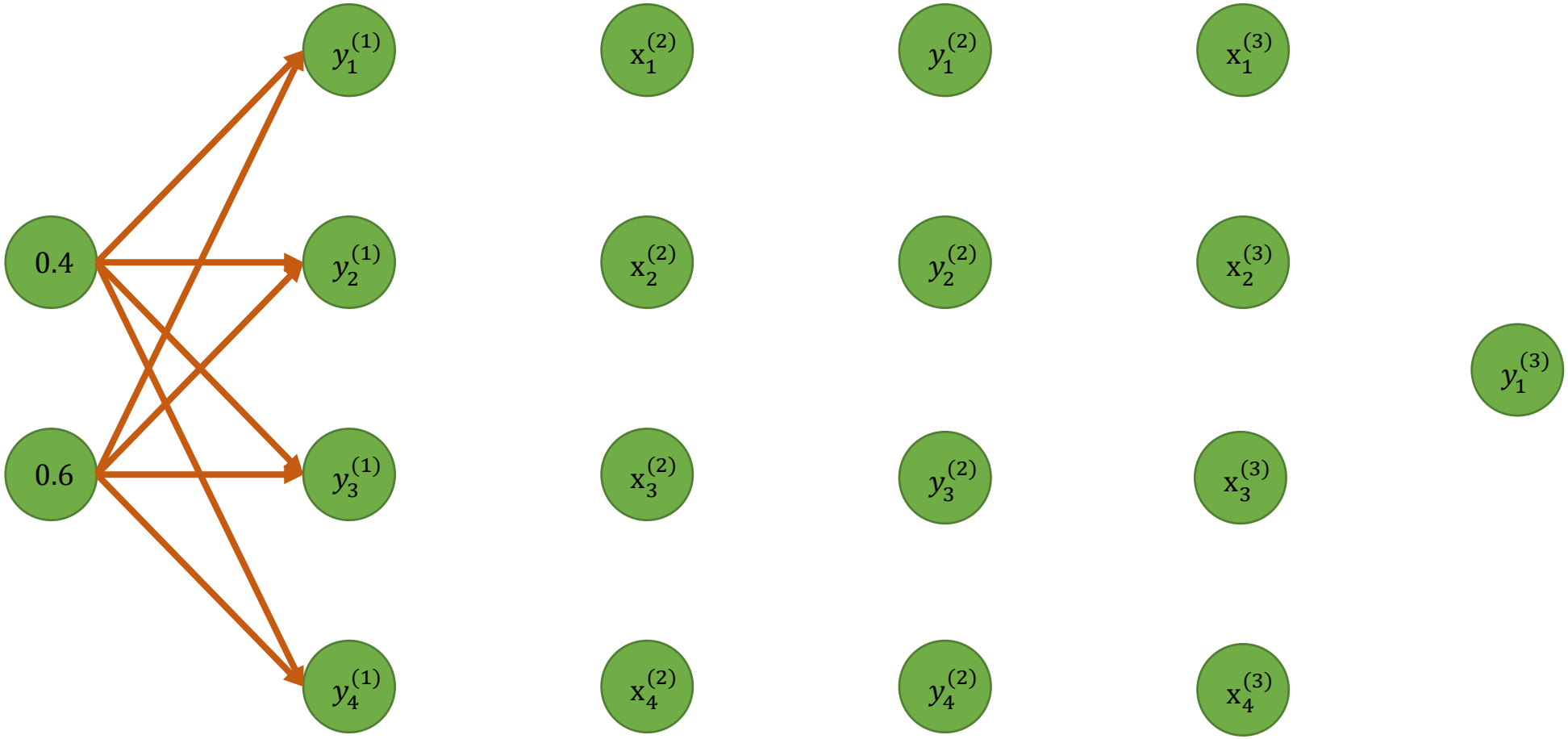
$$W^{(1)} = \begin{bmatrix} w_{1,1}^{(1)} w_{1,2}^{(1)} w_{1,3}^{(1)} w_{1,4}^{(1)} \\ w_{2,1}^{(1)} w_{2,2}^{(1)} w_{2,3}^{(1)} w_{2,4}^{(1)} \end{bmatrix} \qquad \theta^{(1)} = \begin{bmatrix} \theta_{1,1}^{(1)} \ \theta_{1,2}^{(1)} \ \theta_{1,3}^{(1)} \ \theta_{1,4}^{(1)} \end{bmatrix}$$



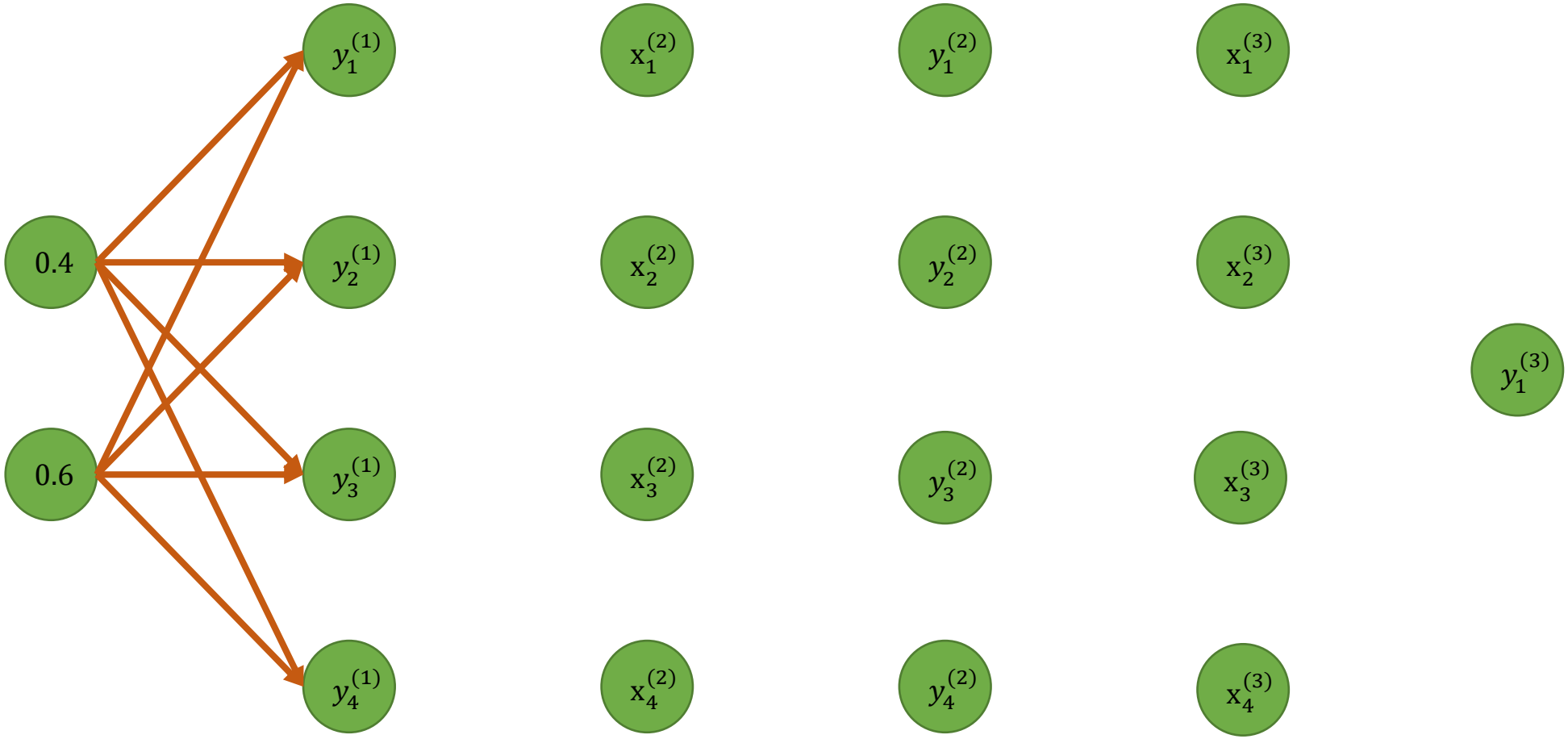
$$\begin{bmatrix} y_1^{(1)} & y_2^{(1)} & y_3^{(1)} & y_4^{(1)} \end{bmatrix} = \begin{bmatrix} x_1^{(1)} & x_2^{(1)} \end{bmatrix} \begin{bmatrix} w_{1,1}^{(1)} & w_{1,2}^{(1)} & w_{1,3}^{(1)} & w_{1,4}^{(1)} \\ w_{2,1}^{(1)} & w_{2,2}^{(1)} & w_{2,3}^{(1)} & w_{2,4}^{(1)} \end{bmatrix} + \begin{bmatrix} \theta_{1,1}^{(1)} & \theta_{1,2}^{(1)} & \theta_{1,3}^{(1)} & \theta_{1,4}^{(1)} \end{bmatrix}$$



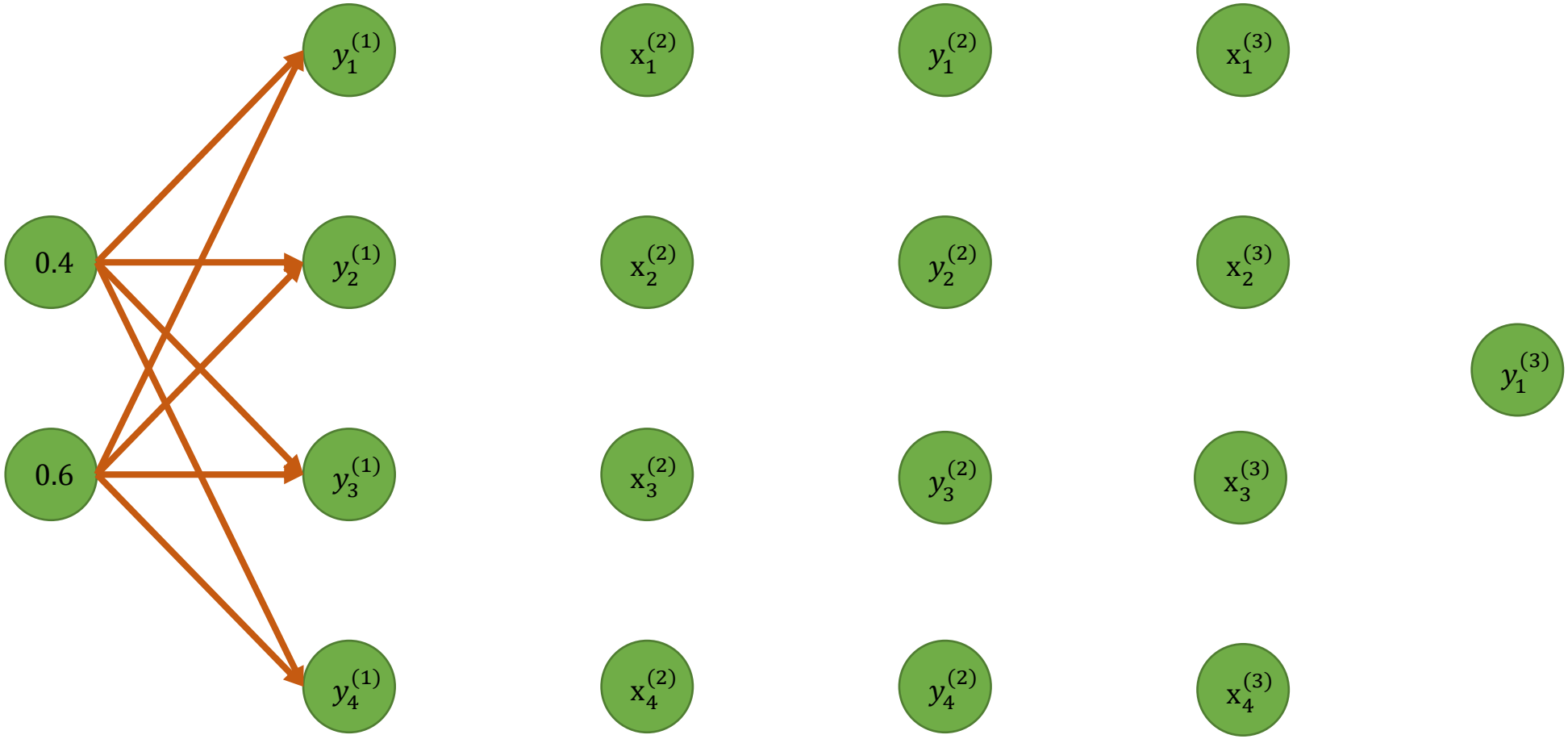
$$\left[y_1^{(1)}\ y_2^{(1)}\ y_3^{(1)}\ y_4^{(1)}\right] = \left[x_1^{(1)}\ x_2^{(1)}\right] \begin{bmatrix} w_{1,1}^{(1)} & w_{1,2}^{(1)} & w_{1,3}^{(1)} & w_{1,4}^{(1)} \\ w_{2,1}^{(1)} & w_{2,2}^{(1)} & w_{2,3}^{(1)} & w_{2,4}^{(1)} \end{bmatrix} + \left[\theta_{1,1}^{(1)}\ \theta_{1,2}^{(1)}\ \theta_{1,3}^{(1)}\ \theta_{1,4}^{(1)}\right]$$



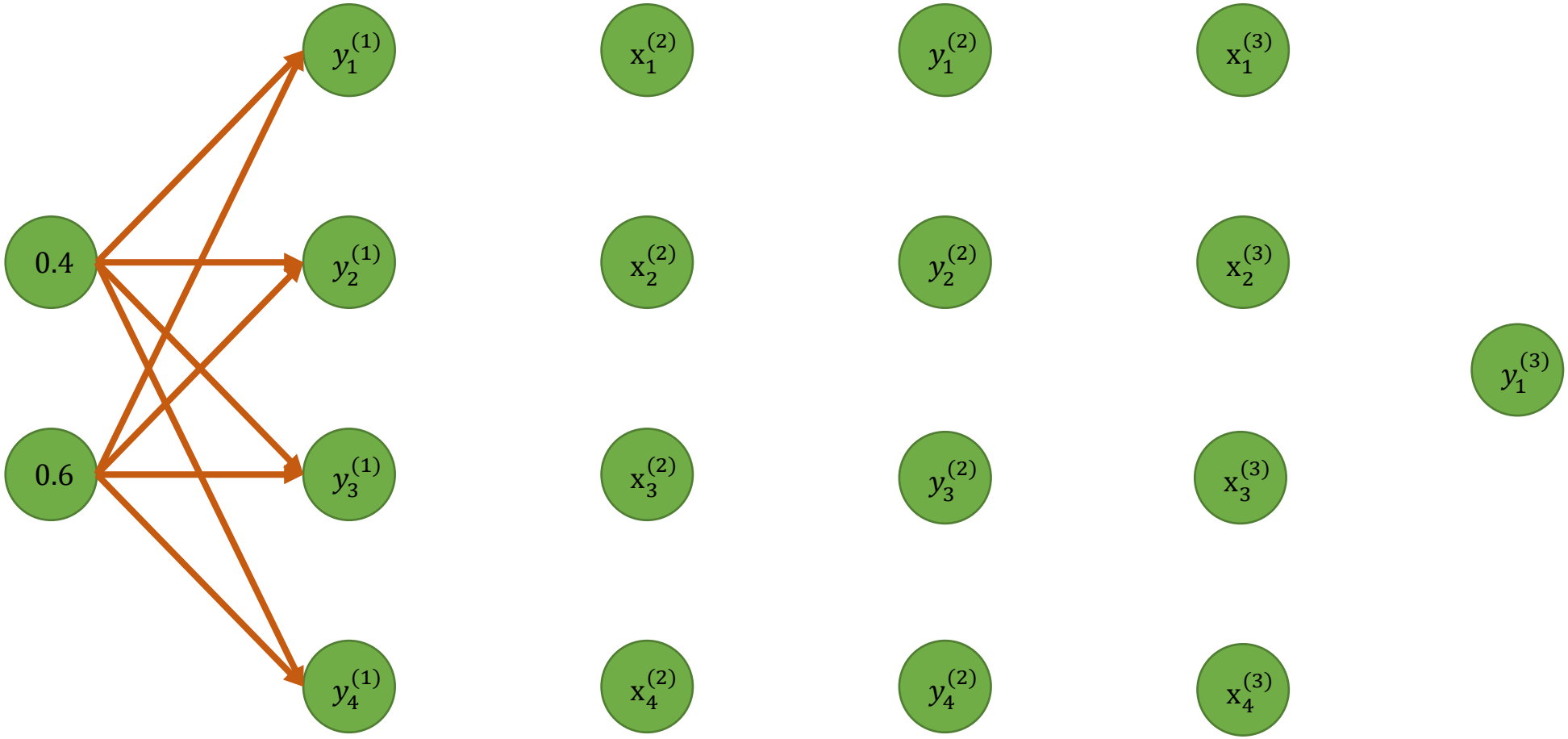
$$\left[y_1^{(1)}\ y_2^{(1)}\ y_3^{(1)}\ y_4^{(1)}\right] = \left[x_1^{(1)}\ x_2^{(1)}\right] \begin{bmatrix} w_{1,1}^{(1)} & w_{1,2}^{(1)} & w_{1,3}^{(1)} & w_{1,4}^{(1)} \\ w_{2,1}^{(1)} & w_{2,2}^{(1)} & w_{2,3}^{(1)} & w_{2,4}^{(1)} \end{bmatrix} + \left[\theta_{1,1}^{(1)}\ \theta_{1,2}^{(1)}\ \theta_{1,3}^{(1)}\ \theta_{1,4}^{(1)}\right]$$



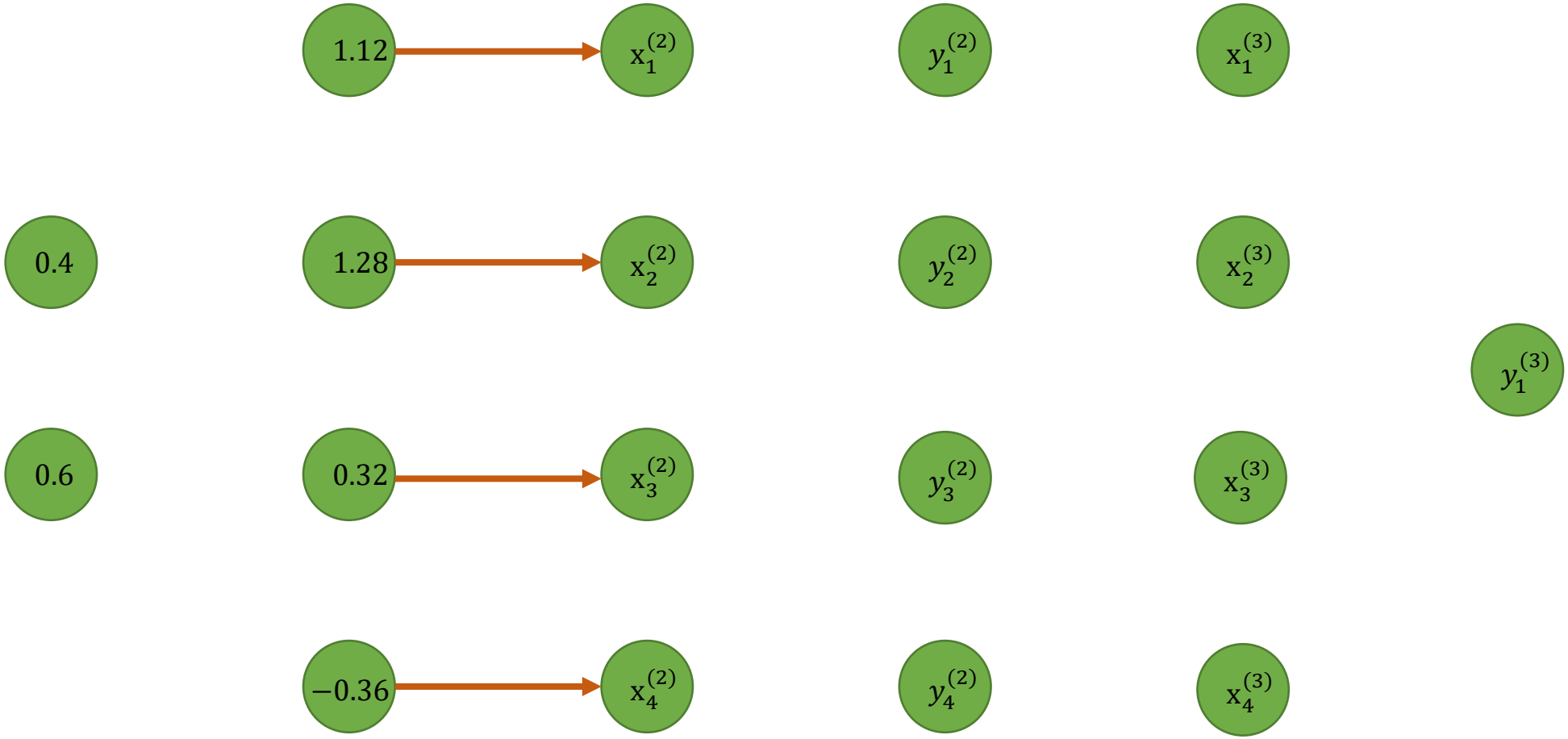
$$\left[y_1^{(1)}\ y_2^{(1)}\ y_3^{(1)}\ y_4^{(1)}\right] = \left[x_1^{(1)}\ x_2^{(1)}\right]\begin{bmatrix} w_{1,1}^{(1)} & w_{1,2}^{(1)} & w_{1,3}^{(1)} & w_{1,4}^{(1)} \\ w_{2,1}^{(1)} & w_{2,2}^{(1)} & w_{2,3}^{(1)} & w_{2,4}^{(1)} \end{bmatrix} + \left[\theta_{1,1}^{(1)}\ \theta_{1,2}^{(1)}\ \theta_{1,3}^{(1)}\ \theta_{1,4}^{(1)}\right]$$



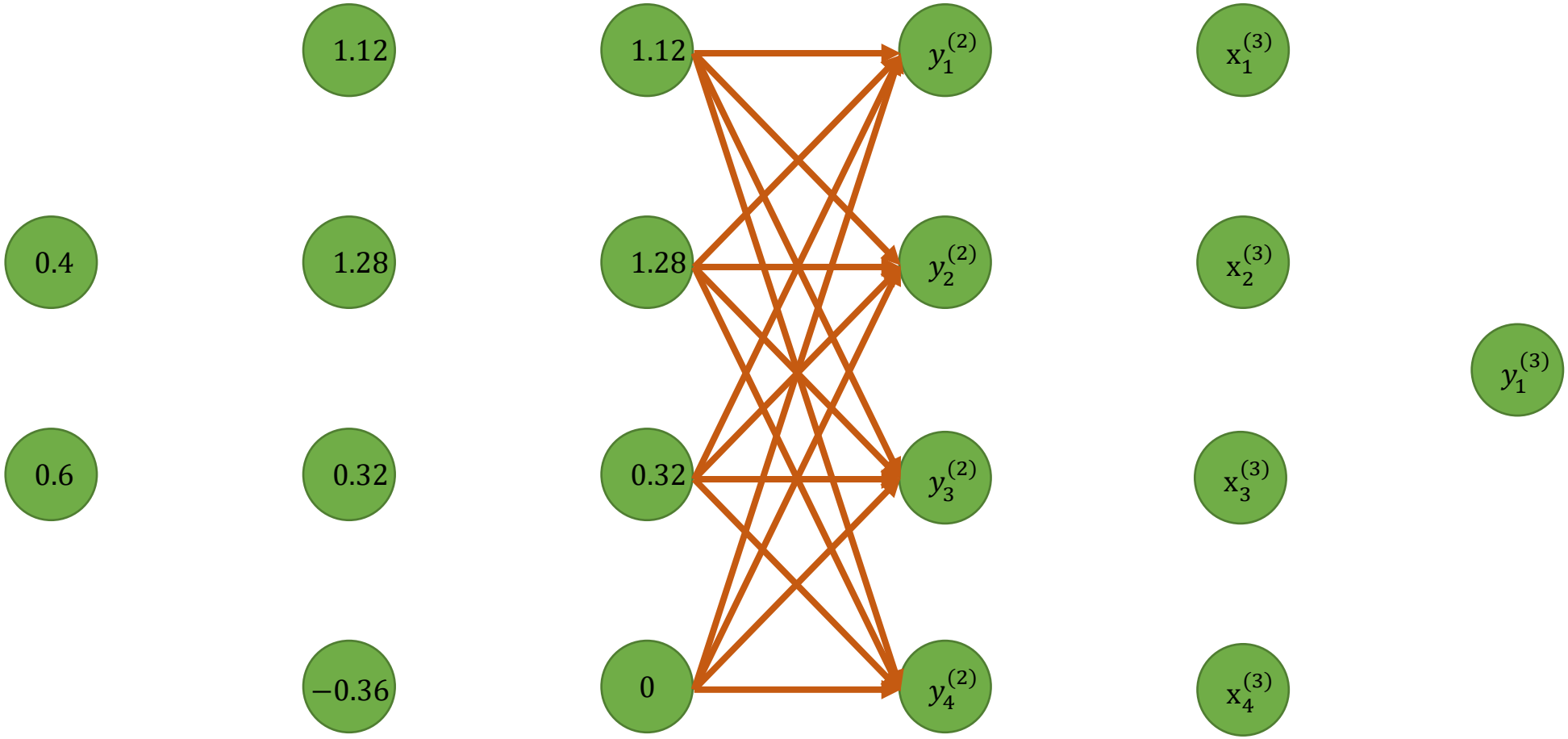
$$[1.12\ 1.28\ 0.32\ -0.36] = [0.4\ 0.6] \begin{bmatrix} 1.1 & -0.3 & -0.1 & -0.6 \\ -0.2 & 0.5 & 1.1 & -0.2 \end{bmatrix} + [0.8\ 1.1\ -0.3\ 0.0]$$



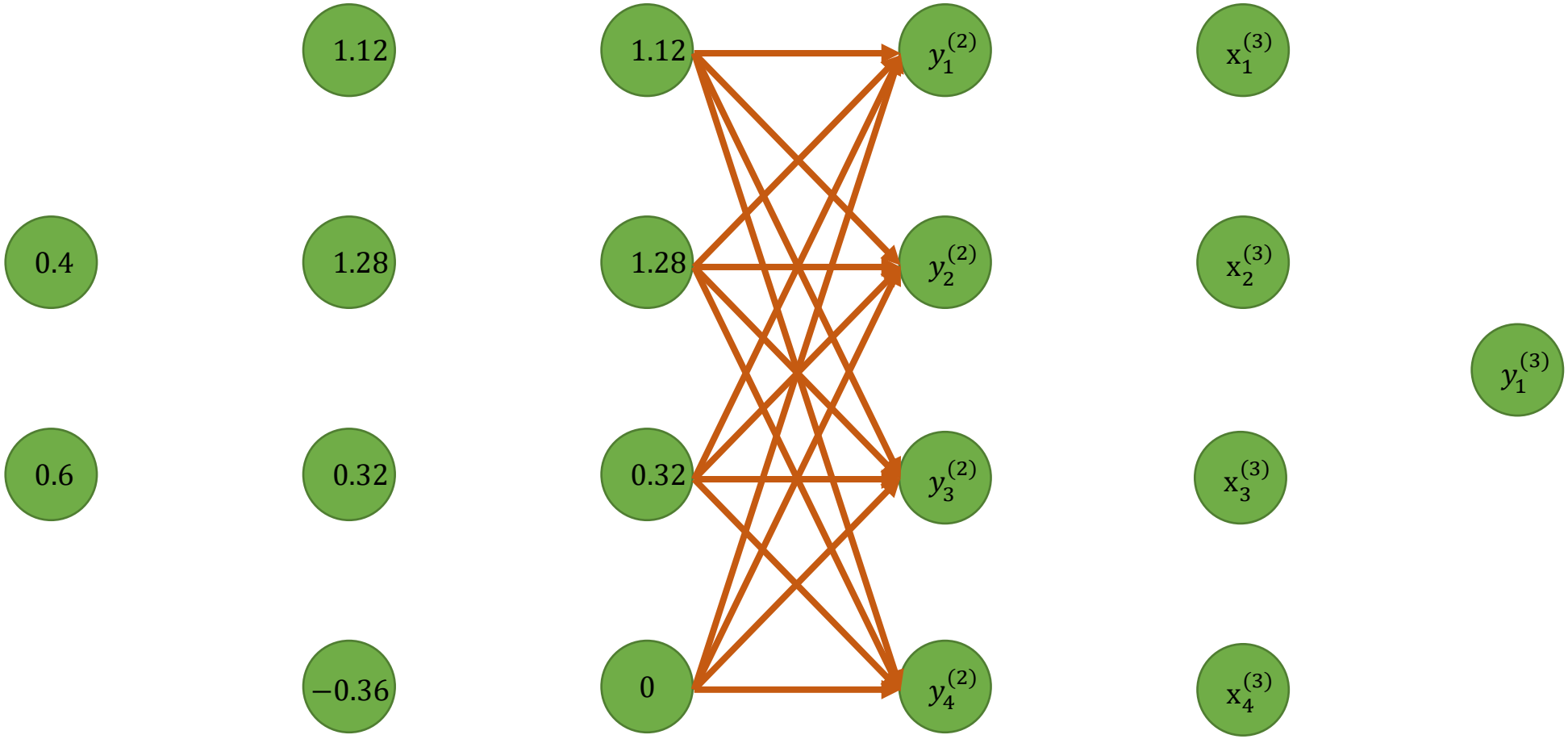
$$y = ReLU(x) = \begin{cases} 0, & x < 0 \\ x, & x \geq 0 \end{cases}$$



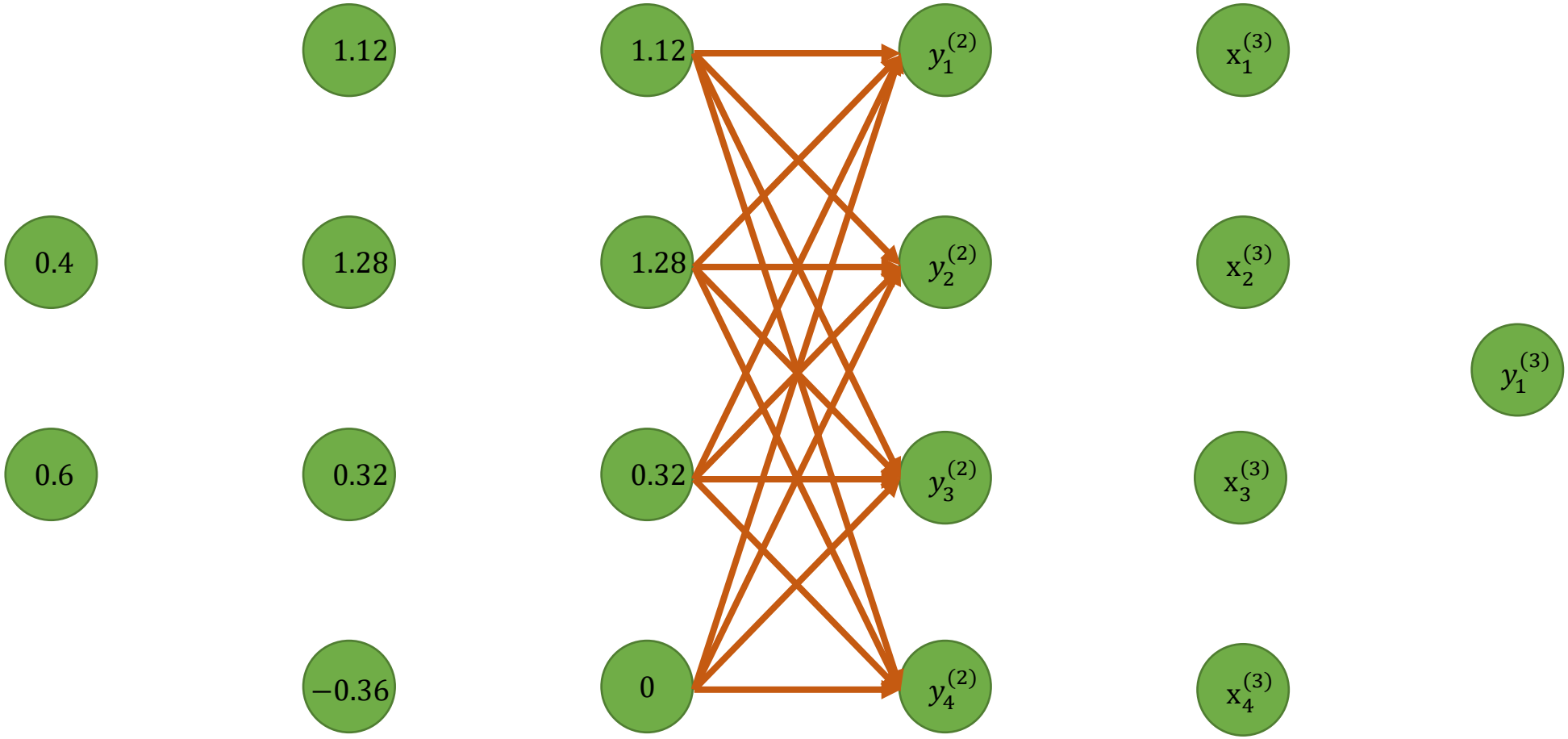
$$W^{(2)} = \begin{bmatrix} w_{1,1}^{(2)} w_{1,2}^{(2)} w_{1,3}^{(2)} w_{1,4}^{(2)} \\ w_{2,1}^{(2)} w_{2,2}^{(2)} w_{2,3}^{(2)} w_{2,4}^{(2)} \\ w_{3,1}^{(2)} w_{3,2}^{(2)} w_{3,3}^{(2)} w_{3,4}^{(2)} \\ w_{4,1}^{(2)} w_{4,2}^{(2)} w_{4,3}^{(2)} w_{4,4}^{(2)} \end{bmatrix} \qquad \theta^{(2)} = \begin{bmatrix} \theta_{1,1}^{(2)} \ \theta_{1,2}^{(2)} \ \theta_{1,3}^{(2)} \ \theta_{1,4}^{(2)} \end{bmatrix}$$



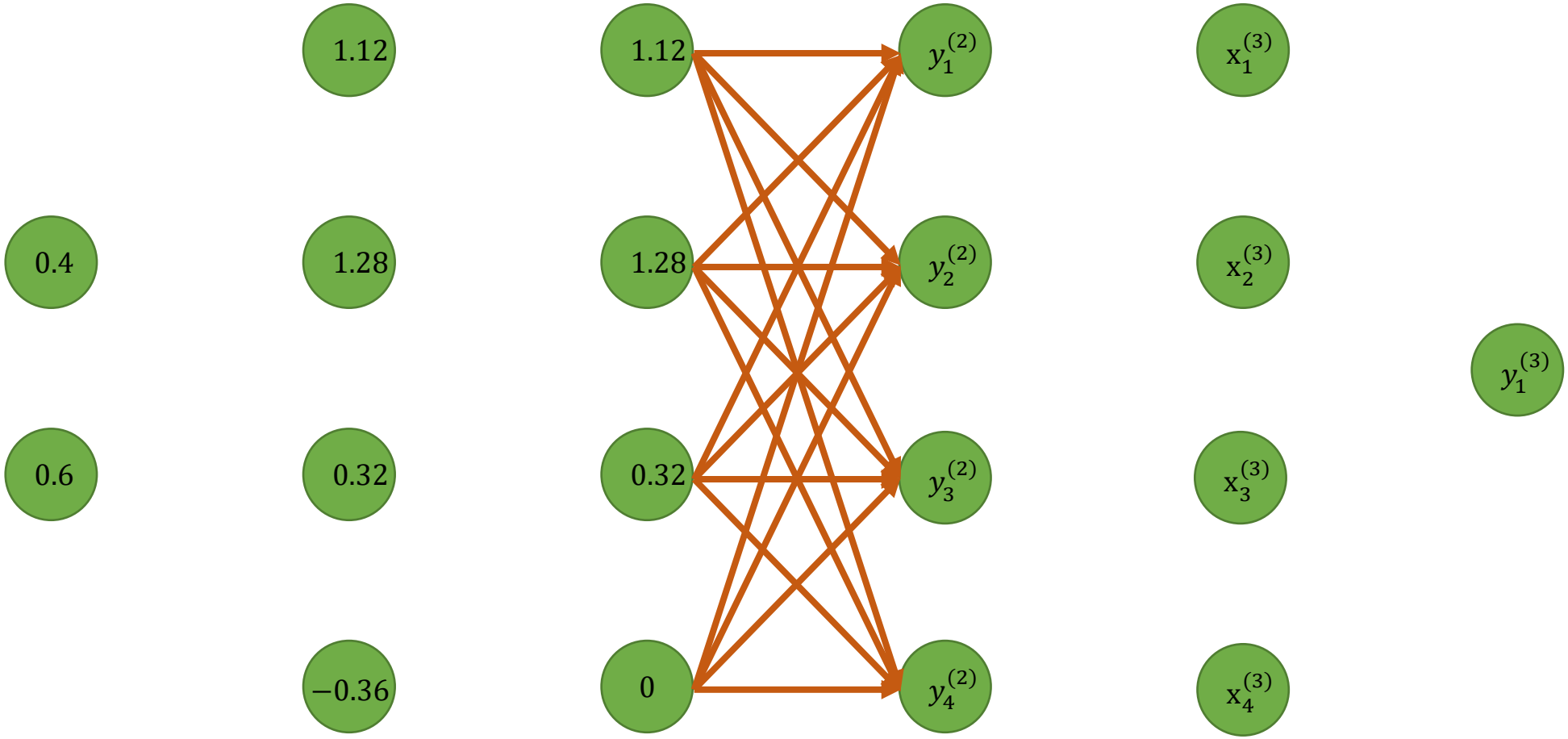
$$\begin{bmatrix} y_1^{(2)} & y_2^{(2)} & y_3^{(2)} & y_4^{(2)} \end{bmatrix} = \begin{bmatrix} x_1^{(2)} & x_2^{(2)} & x_3^{(2)} & x_4^{(2)} \end{bmatrix} \begin{bmatrix} w_{1,1}^{(2)} & w_{1,2}^{(2)} & w_{1,3}^{(2)} & w_{1,4}^{(2)} \\ w_{2,1}^{(2)} & w_{2,2}^{(2)} & w_{2,3}^{(2)} & w_{2,4}^{(2)} \\ w_{3,1}^{(2)} & w_{3,2}^{(2)} & w_{3,3}^{(2)} & w_{3,4}^{(2)} \\ w_{4,1}^{(2)} & w_{4,2}^{(2)} & w_{4,3}^{(2)} & w_{4,4}^{(2)} \end{bmatrix} + \begin{bmatrix} \theta_{1,1}^{(2)} & \theta_{1,2}^{(2)} & \theta_{1,3}^{(2)} & \theta_{1,4}^{(2)} \end{bmatrix}$$



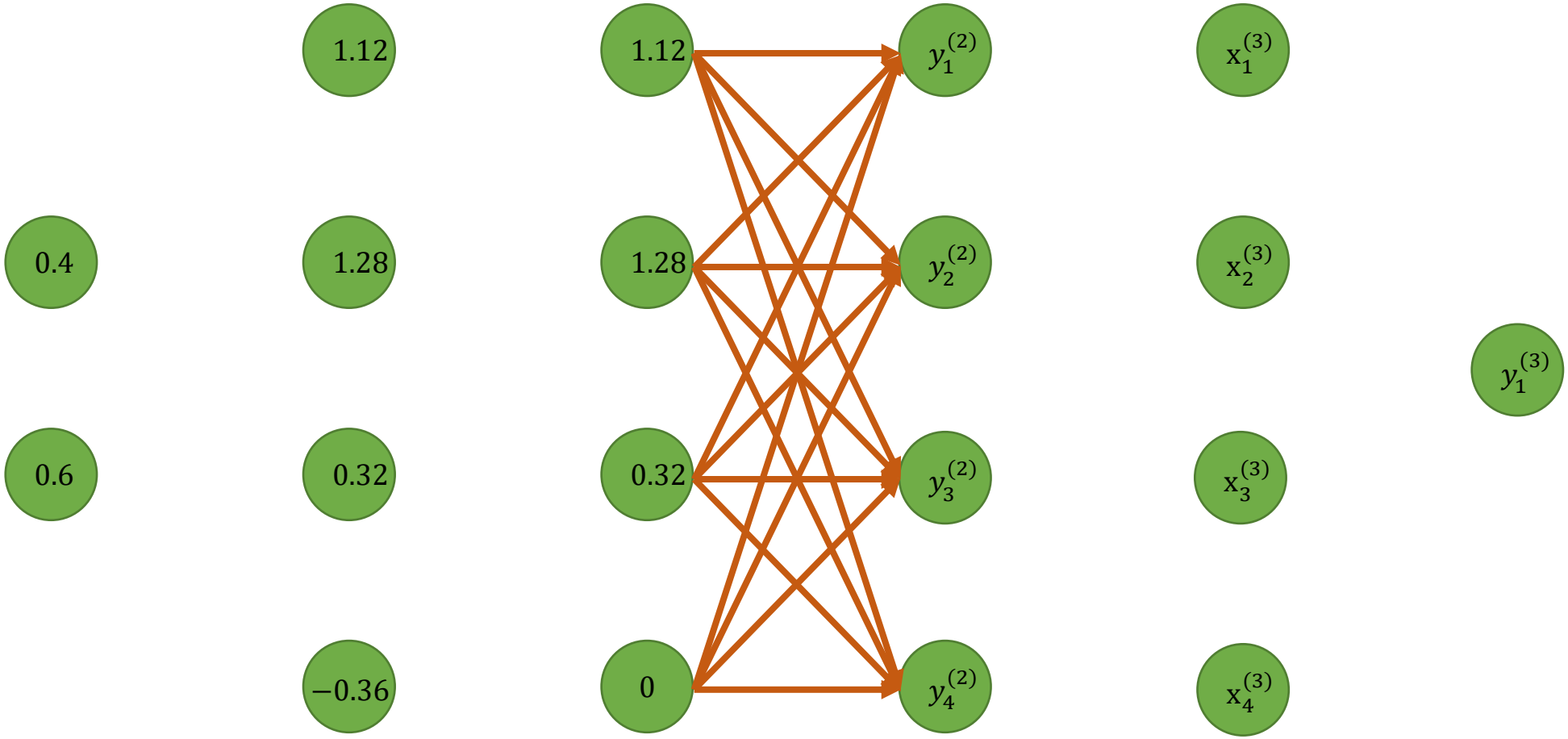
$$\left[y_1^{(2)}\ y_2^{(2)}\ y_3^{(2)}\ y_4^{(2)}\right] = \left[x_1^{(2)}\ x_2^{(2)}\ x_3^{(2)}\ x_4^{(2)}\right] \begin{bmatrix} w_{1,1}^{(2)} & w_{1,2}^{(2)} & w_{1,3}^{(2)} & w_{1,4}^{(2)} \\ w_{2,1}^{(2)} & w_{2,2}^{(2)} & w_{2,3}^{(2)} & w_{2,4}^{(2)} \\ w_{3,1}^{(2)} & w_{3,2}^{(2)} & w_{3,3}^{(2)} & w_{3,4}^{(2)} \\ w_{4,1}^{(2)} & w_{4,2}^{(2)} & w_{4,3}^{(2)} & w_{4,4}^{(2)} \end{bmatrix} + \left[\theta_{1,1}^{(2)}\ \theta_{1,2}^{(2)}\ \theta_{1,3}^{(2)}\ \theta_{1,4}^{(2)}\right]$$



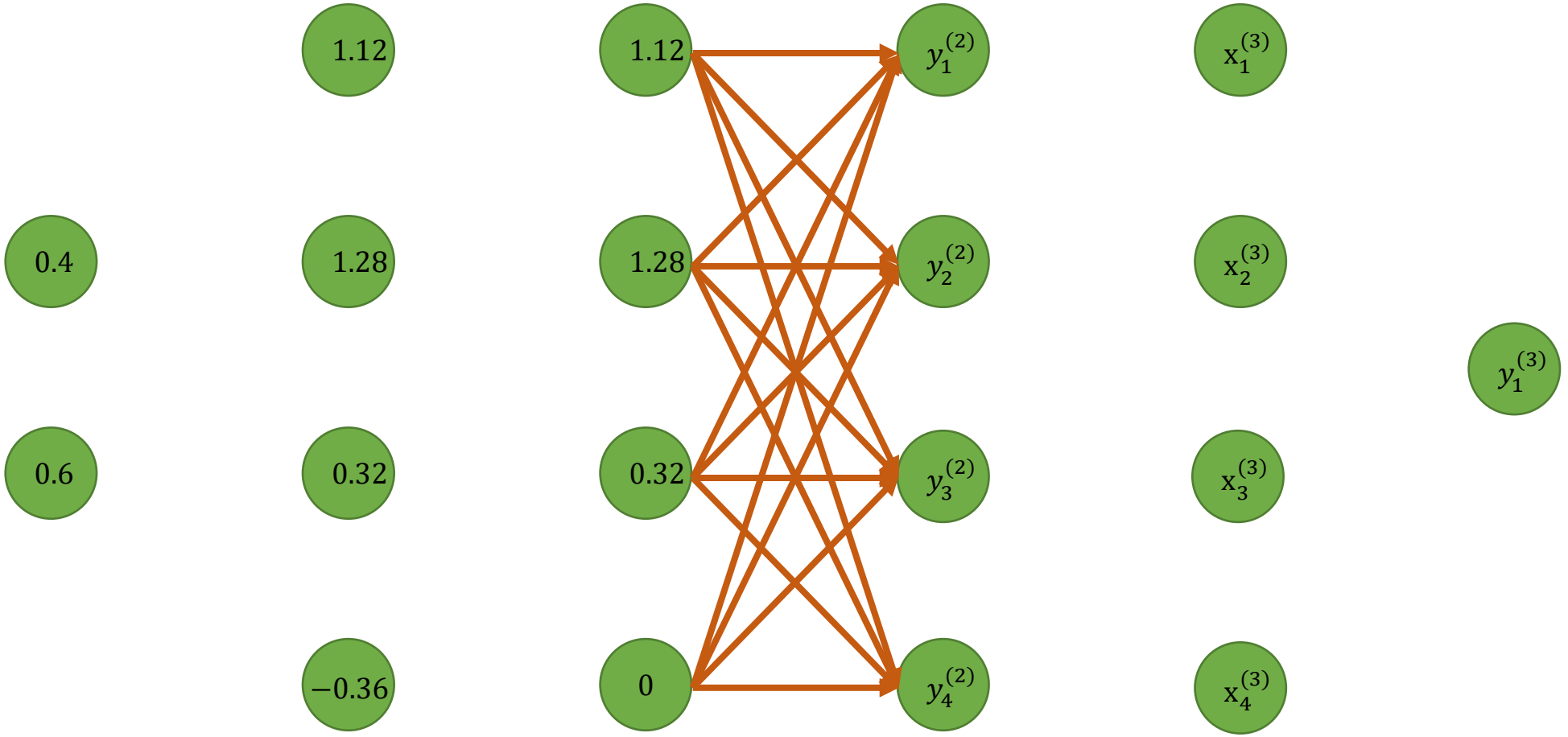
$$\left[y_1^{(2)}\ y_2^{(2)}\ y_3^{(2)}\ y_4^{(2)}\right] = \left[x_1^{(2)}\ x_2^{(2)}\ x_3^{(2)}\ x_4^{(2)}\right]\begin{bmatrix} w_{1,1}^{(2)} & w_{1,2}^{(2)} & w_{1,3}^{(2)} & w_{1,4}^{(2)} \\ w_{2,1}^{(2)} & w_{2,2}^{(2)} & w_{2,3}^{(2)} & w_{2,4}^{(2)} \\ w_{3,1}^{(2)} & w_{3,2}^{(2)} & w_{3,3}^{(2)} & w_{3,4}^{(2)} \\ w_{4,1}^{(2)} & w_{4,2}^{(2)} & w_{4,3}^{(2)} & w_{4,4}^{(2)} \end{bmatrix} + \left[\theta_{1,1}^{(2)}\ \theta_{1,2}^{(2)}\ \theta_{1,3}^{(2)}\ \theta_{1,4}^{(2)}\right]$$



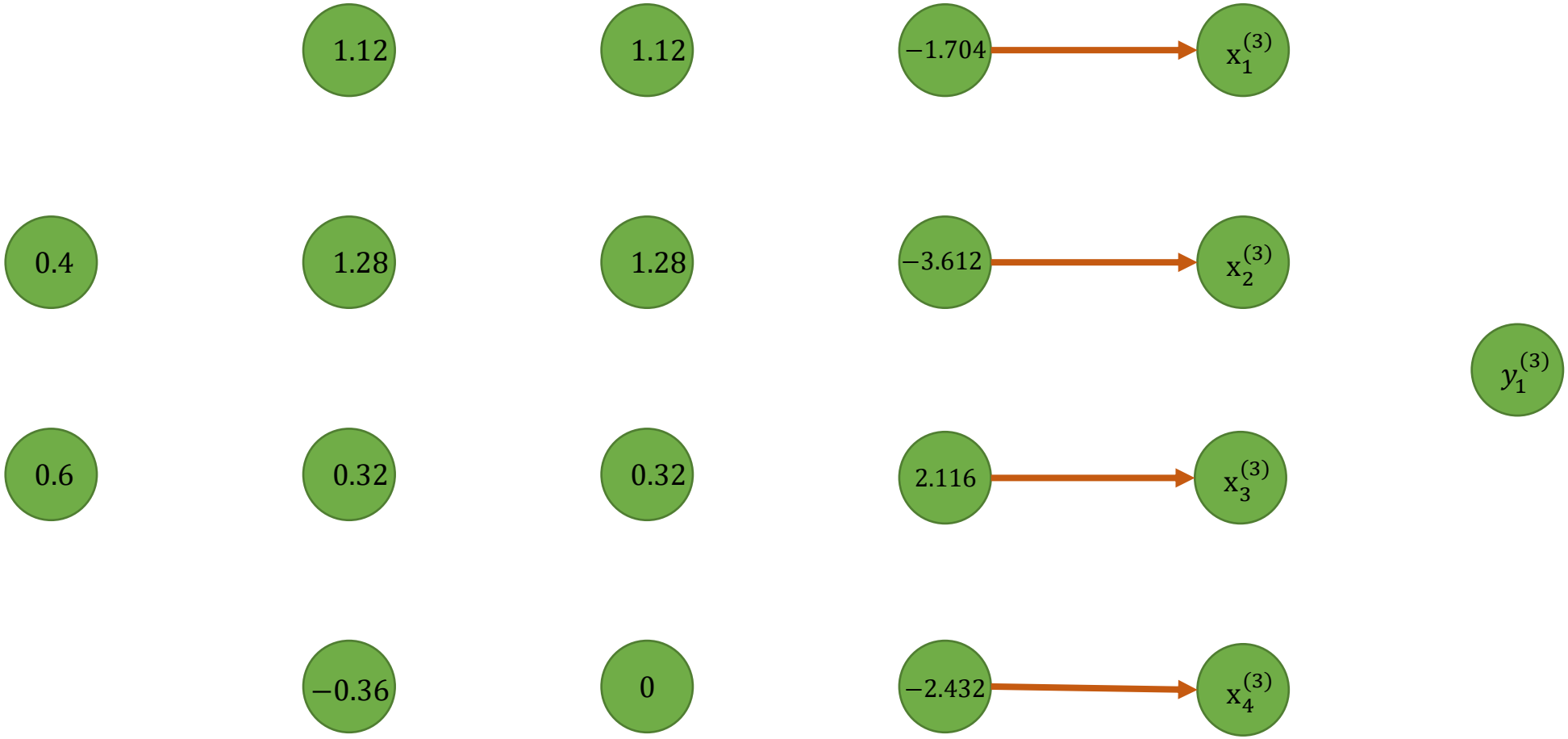
$$\begin{bmatrix} y_1^{(2)} & y_2^{(2)} & y_3^{(2)} & y_4^{(2)} \end{bmatrix} = \begin{bmatrix} x_1^{(2)} & x_2^{(2)} & x_3^{(2)} & x_4^{(2)} \end{bmatrix} \begin{bmatrix} w_{1,1}^{(2)} & w_{1,2}^{(2)} & w_{1,3}^{(2)} & w_{1,4}^{(2)} \\ w_{2,1}^{(2)} & w_{2,2}^{(2)} & w_{2,3}^{(2)} & w_{2,4}^{(2)} \\ w_{3,1}^{(2)} & w_{3,2}^{(2)} & w_{3,3}^{(2)} & w_{3,4}^{(2)} \\ w_{4,1}^{(2)} & w_{4,2}^{(2)} & w_{4,3}^{(2)} & w_{4,4}^{(2)} \end{bmatrix} + \begin{bmatrix} \theta_{1,1}^{(2)} & \theta_{1,2}^{(2)} & \theta_{1,3}^{(2)} & \theta_{1,4}^{(2)} \end{bmatrix}$$



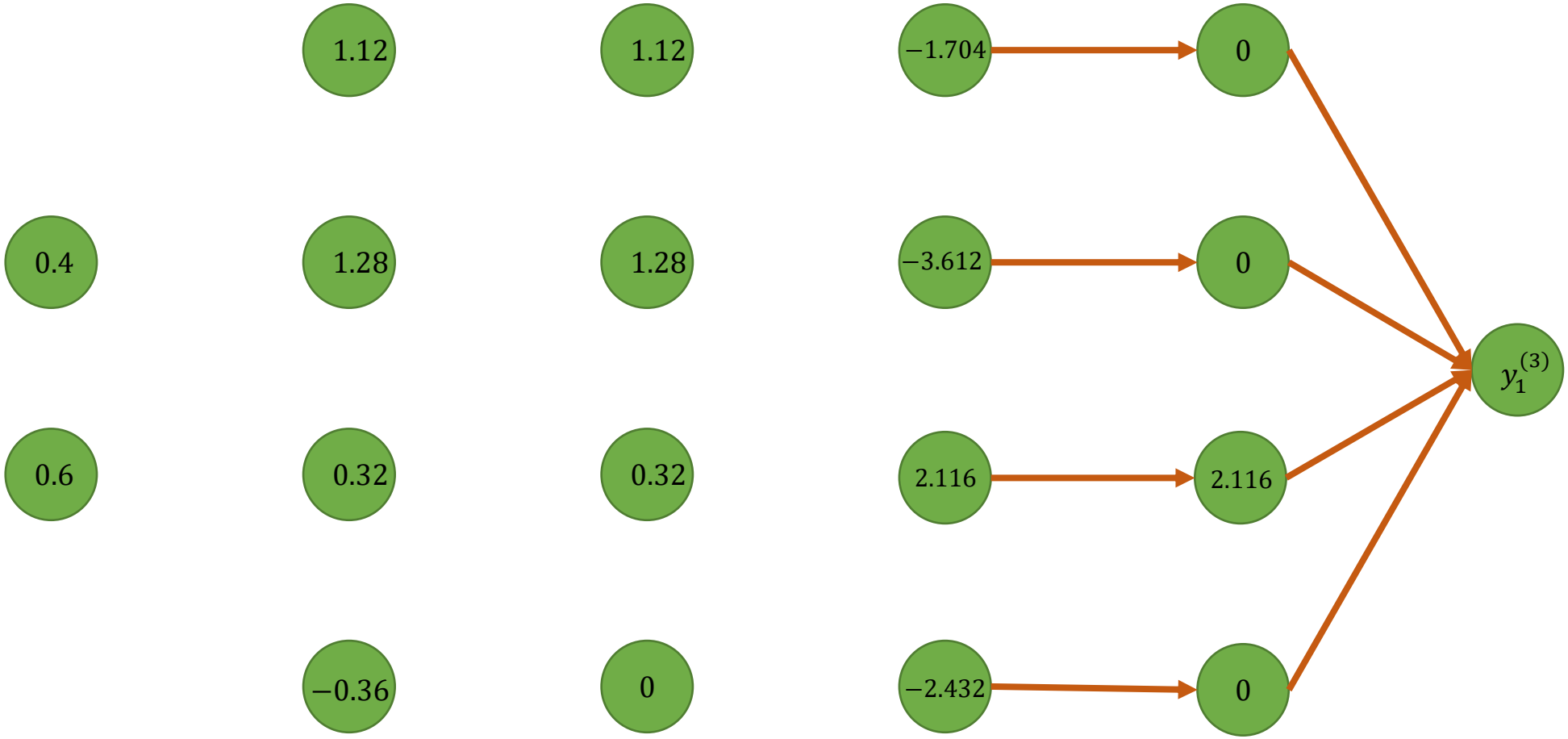
$$[-1.704\ \ -3.612\ 2.116\ \boxed{-2.432}] = [\boxed{1.12\ 1.28\ 0.32\ 0.0}] \begin{bmatrix} 1.1 & -1.0 & 0.8 & \boxed{-1.0} \\ 0.0 & -1.6 & 0.0 & \boxed{-0.6} \\ 0.4 & 0.8 & 1.0 & \boxed{0.8} \\ 0.7 & 0.2 & 2.2 & \boxed{0.2} \end{bmatrix} + [-0.6\ \ -0.7\ 0.9\ \boxed{-0.8}]$$



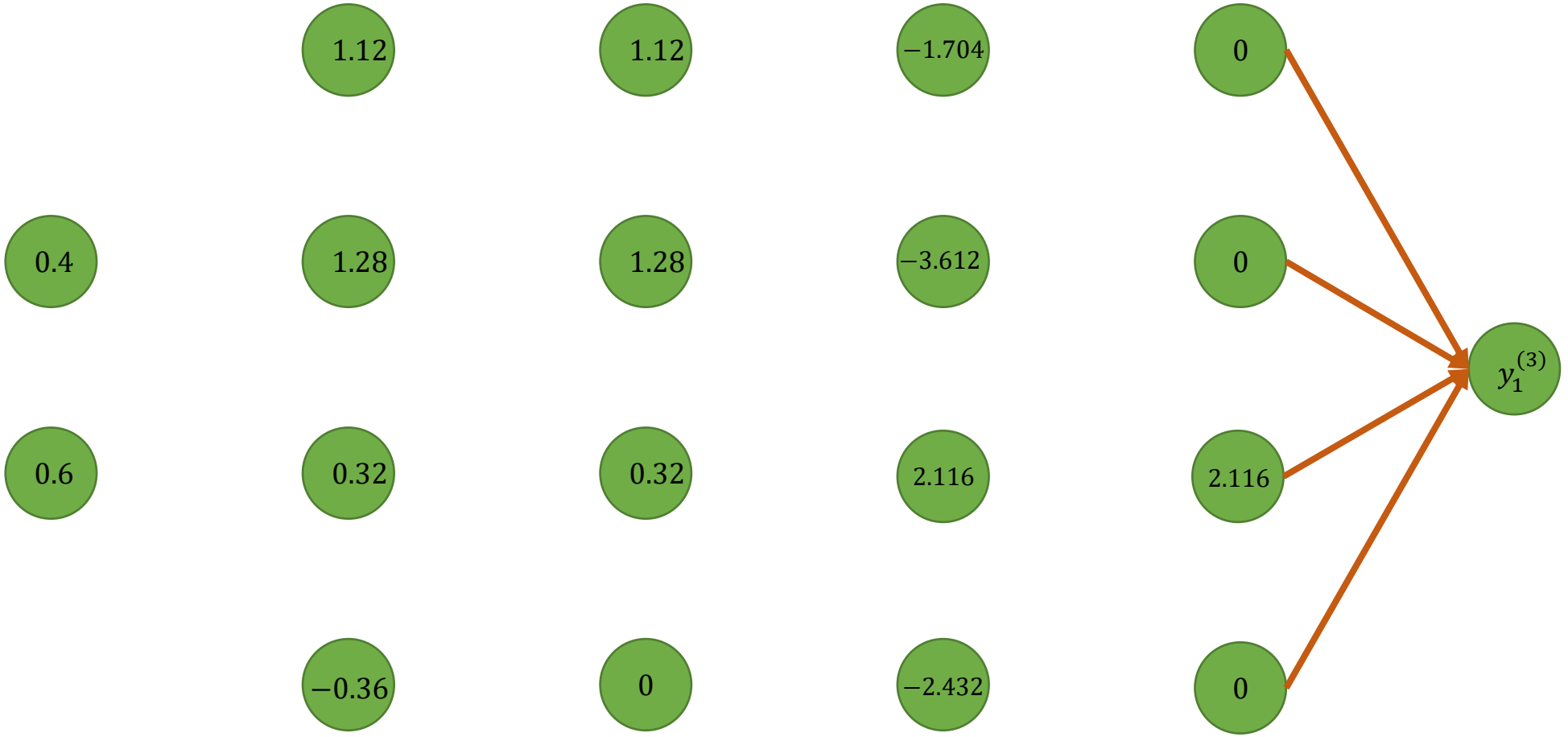
$$y = ReLU(x) = \begin{cases} 0, & x < 0 \\ x, & x \geq 0 \end{cases}$$



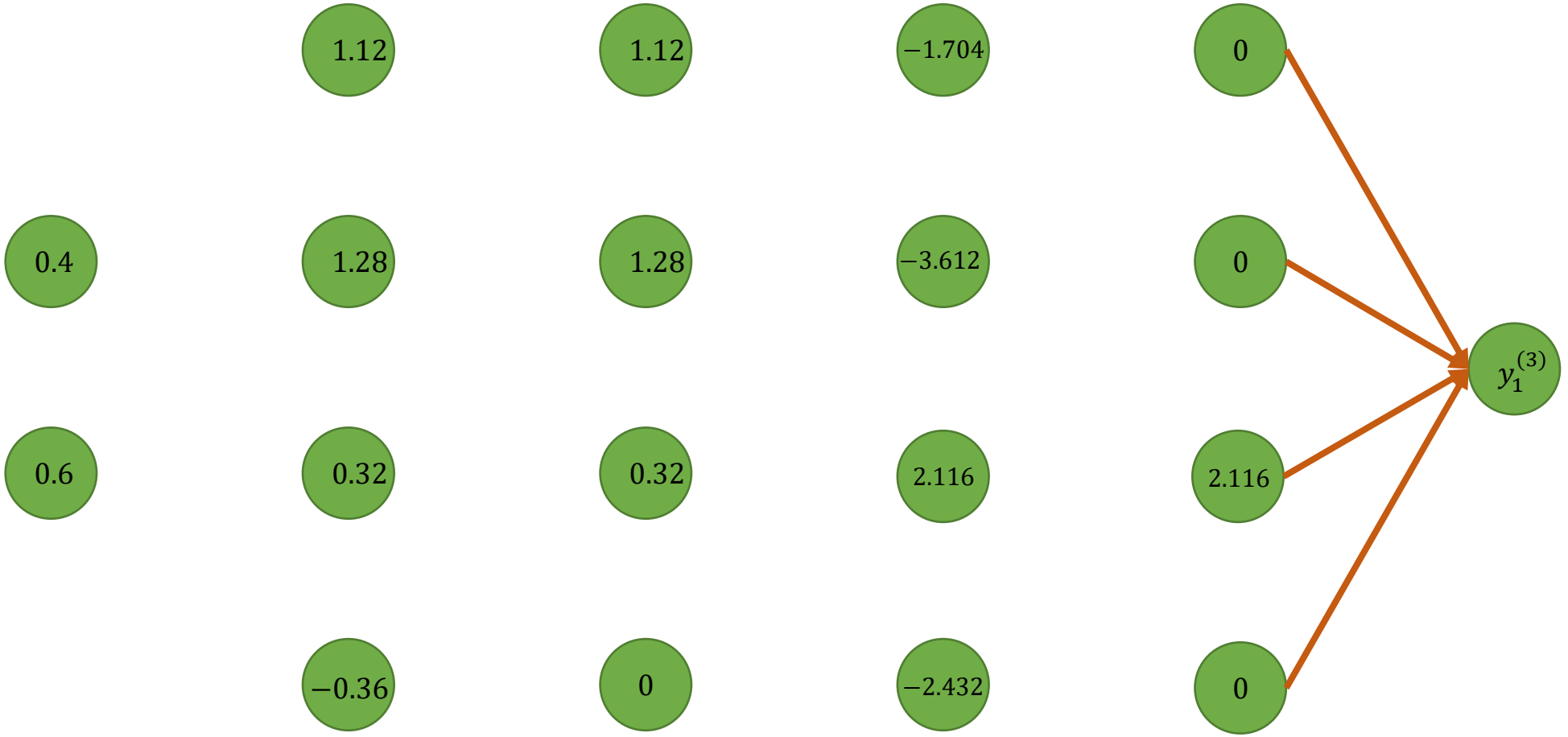
$$W^{(3)} = \begin{bmatrix} w_{1,1}^{(3)} \\ w_{2,1}^{(3)} \\ w_{3,1}^{(3)} \\ w_{4,1}^{(3)} \end{bmatrix} \qquad \theta^{(3)} = \begin{bmatrix} \theta_{1,1}^{(3)} \end{bmatrix}$$



$$\begin{bmatrix} y_1^{(3)} \end{bmatrix} = \begin{bmatrix} x_1^{(3)} & x_2^{(3)} & x_3^{(3)} & x_4^{(3)} \end{bmatrix} \begin{bmatrix} w_{1,1}^{(3)} \\ w_{2,1}^{(3)} \\ w_{3,1}^{(3)} \\ w_{4,1}^{(3)} \end{bmatrix} + \begin{bmatrix} \theta_{1,1}^{(3)} \end{bmatrix}$$



$$[0.7044\ ] = [0\ 0\ 2.116\ 0] \begin{bmatrix} 0.5 \\ 0.5 \\ 0.9 \\ -1.1 \end{bmatrix} + [-1.2]$$



$$[0.7044\ ] = [0\ 0\ 2.116\ 0] \begin{bmatrix} 0.5 \\ 0.5 \\ 0.9 \\ -1.1 \end{bmatrix} + [-1.2]$$