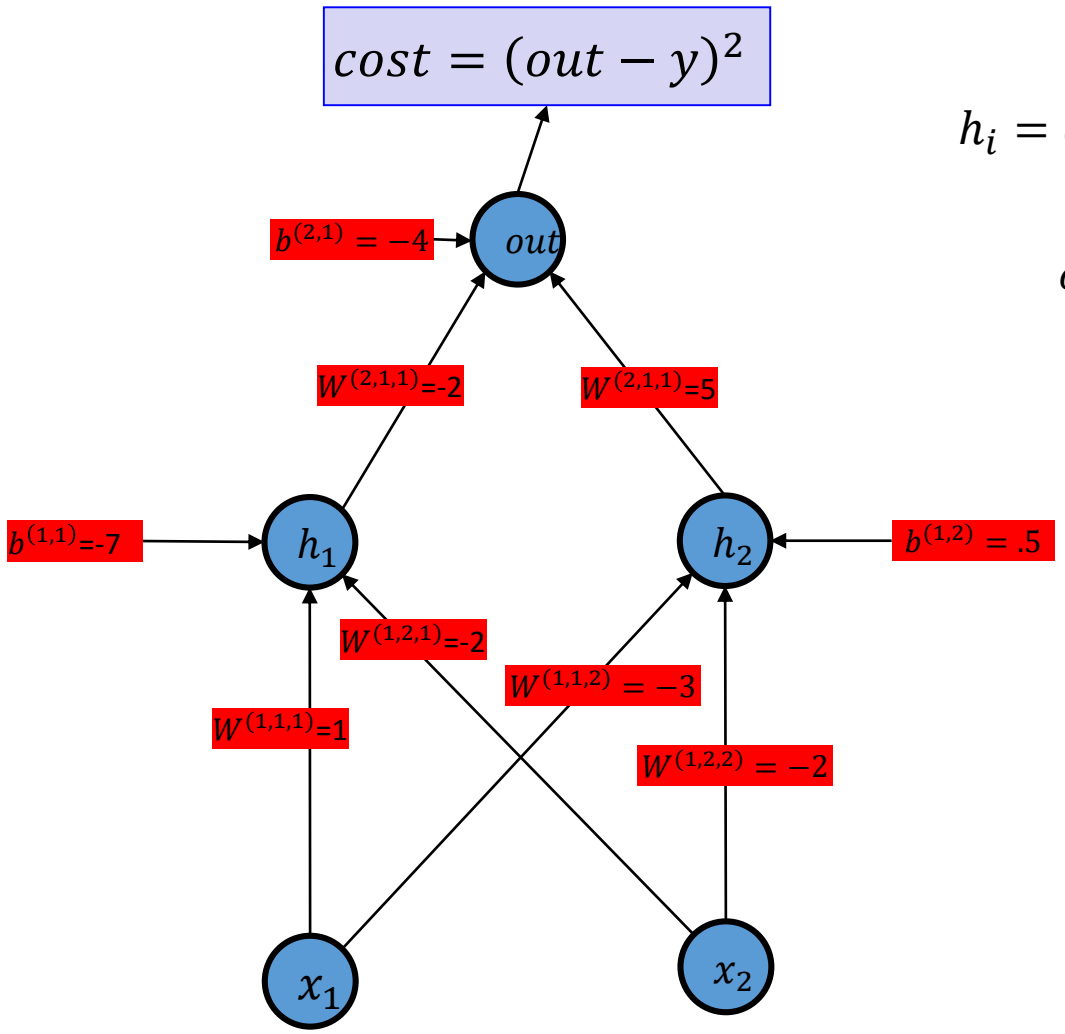
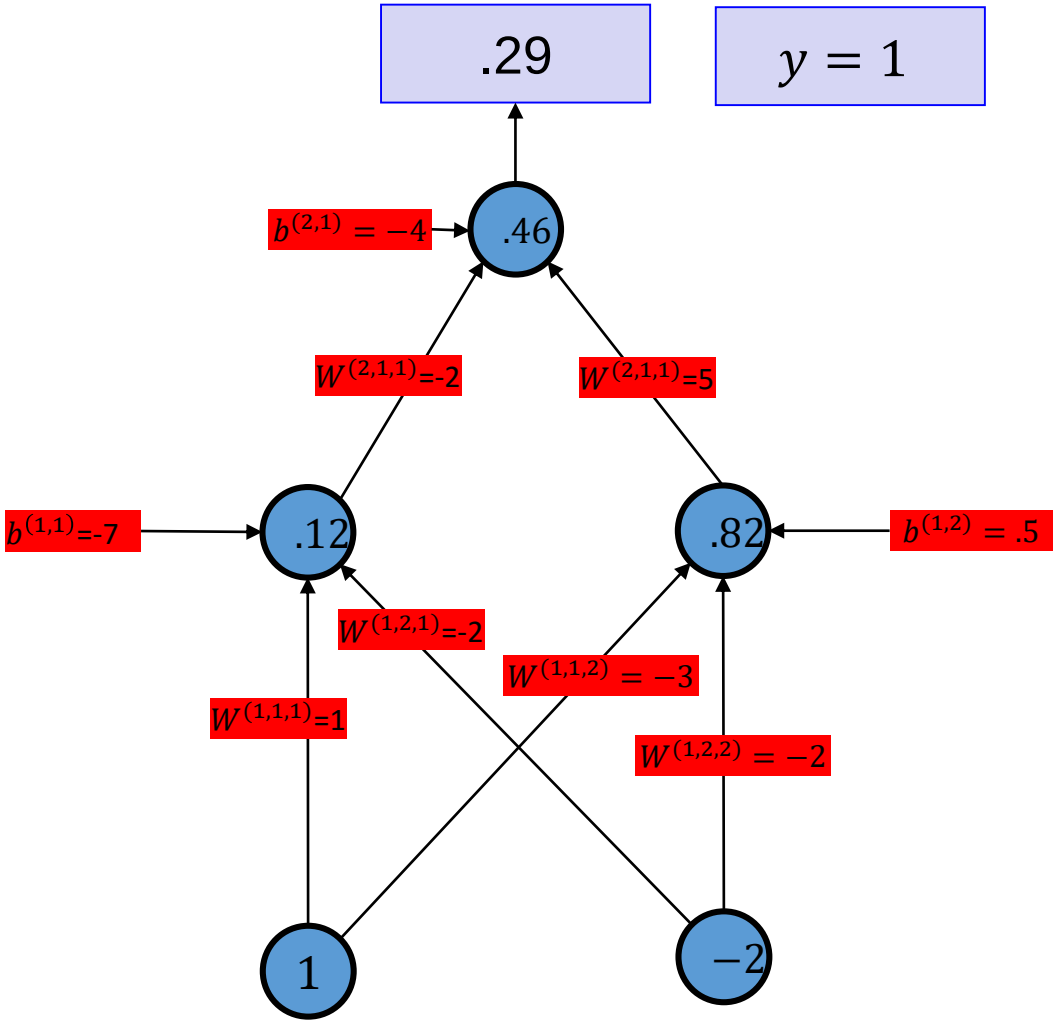
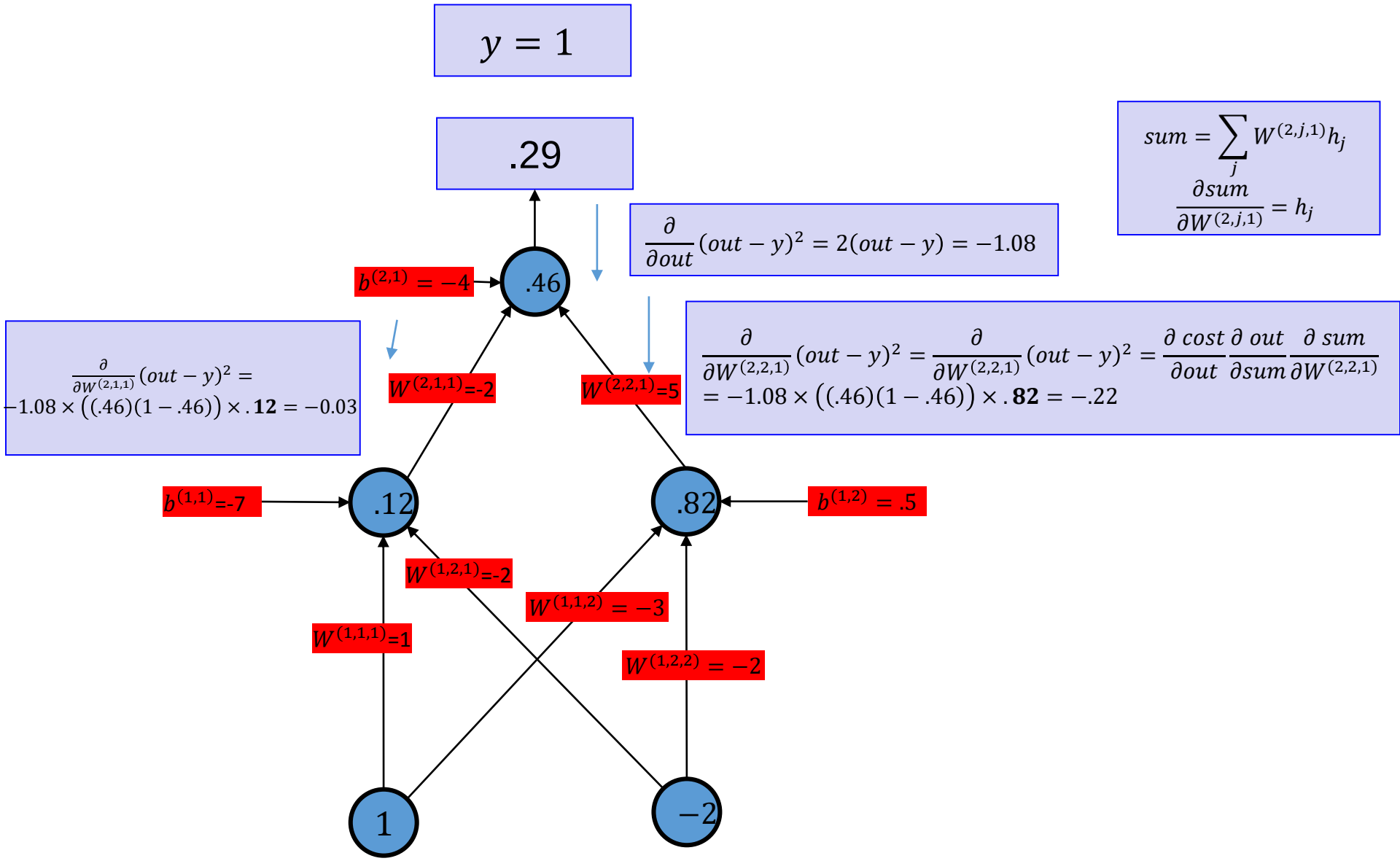


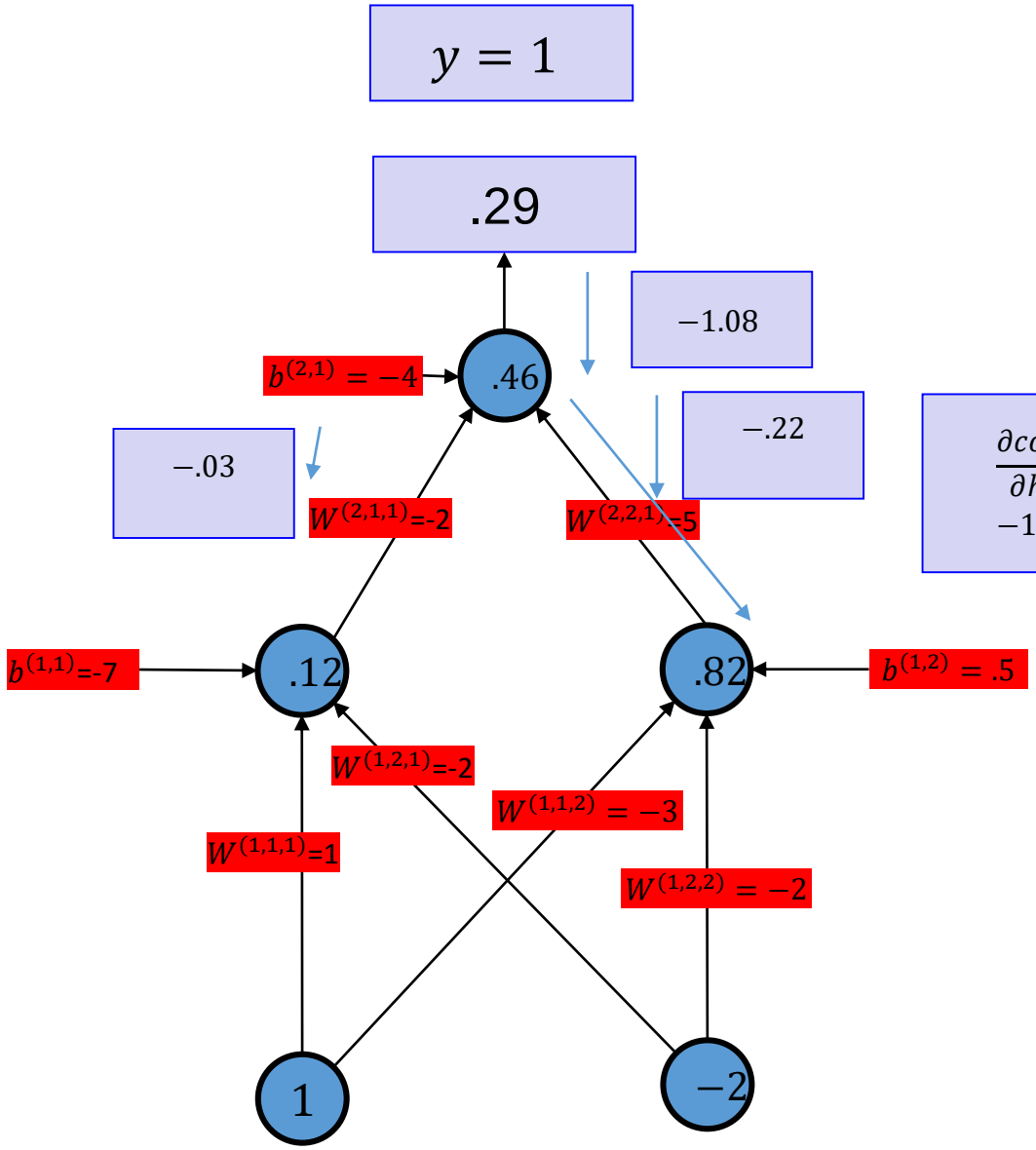
$$h_i = \sigma\left(b^{(1,i)} + \sum_j W^{(1,j,i)} x_j\right)$$

$$\sigma(t) = \frac{1}{1 + \exp(-t)}$$

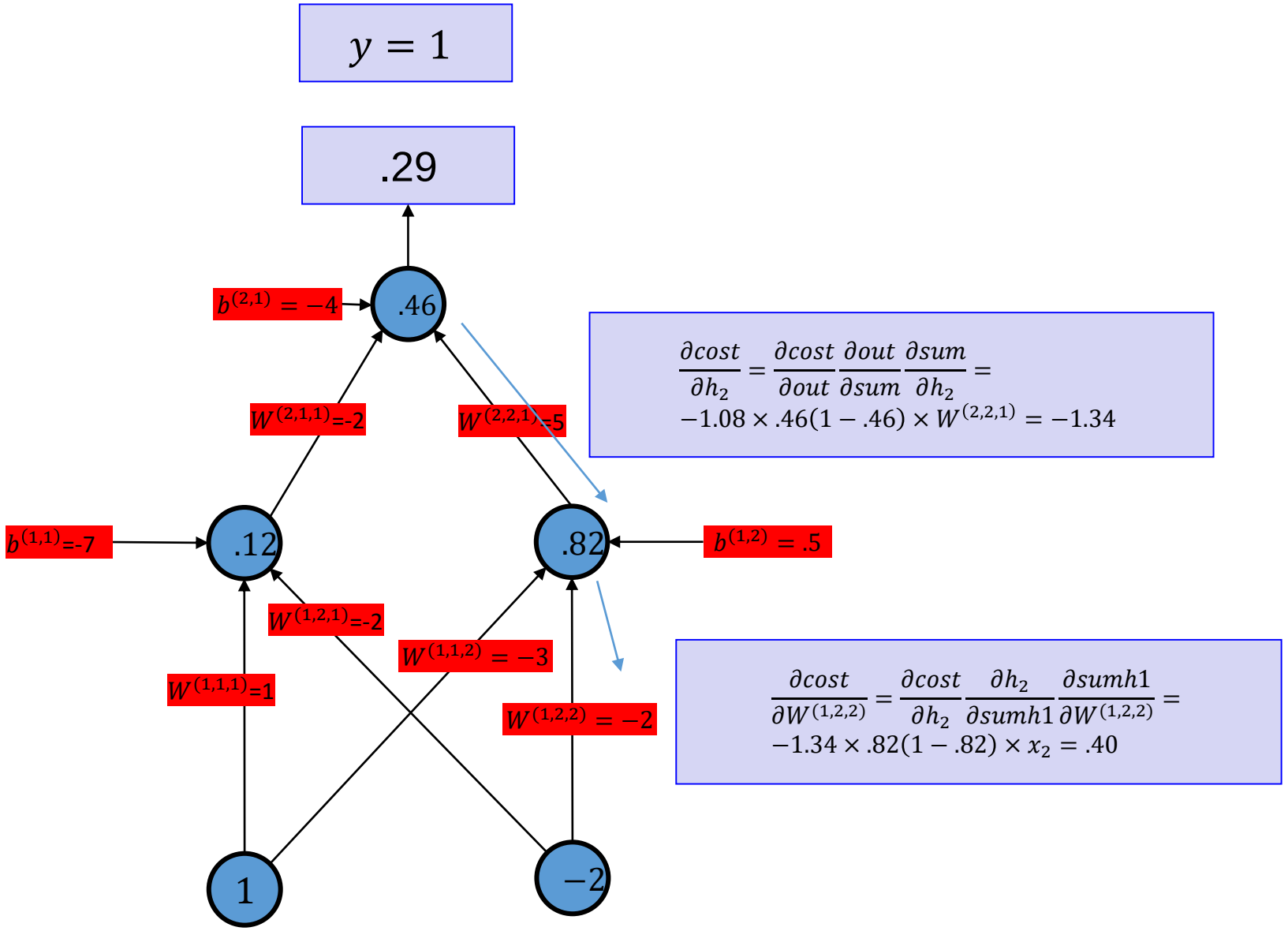
$$\sigma'(t) = \sigma(t)(1 - \sigma(t))$$

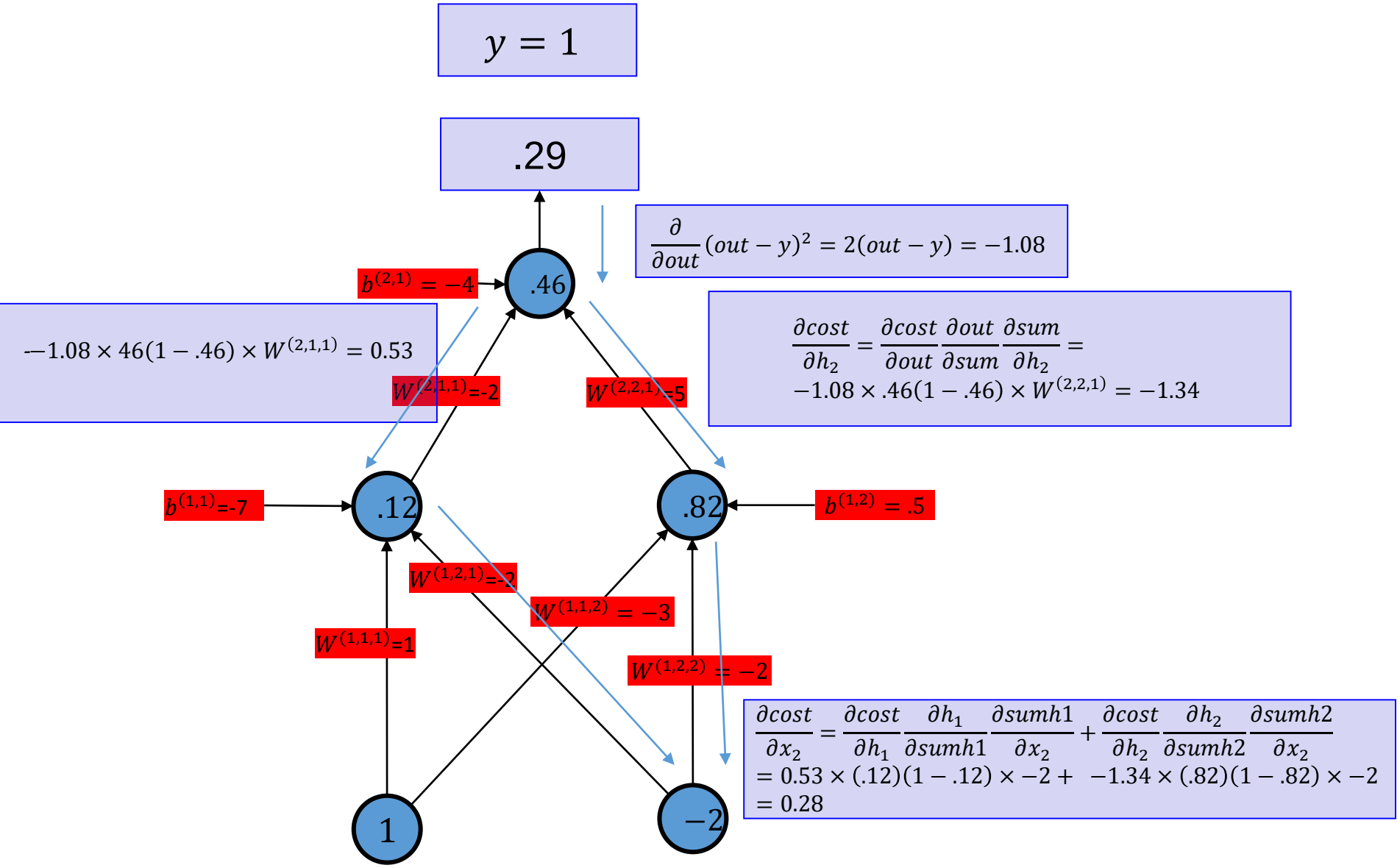

.29
$y = 1$
$b^{(2,1)} = -4$
.46
$W^{(2,1,1)}$=-2
$W^{(2,1,1)}$=5
$b^{(1,1)}$=-7
.12
.82
$b^{(1,2)} = .5$
$W^{(1,2,1)}$=-2
$W^{(1,1,2)} = -3$
$W^{(1,1,1)}$=1
$W^{(1,2,2)} = -2$
1
-2


$y = 1$
.29
$\frac{\partial}{\partial out}(out - y)^2 = 2(out - y) = -1.08$
$sum = \sum_j W^{(2,j,1)} h_j$
$\frac{\partial sum}{\partial W^{(2,j,1)}} = h_j$
$b^{(2,1)} = -4$
.46
$\frac{\partial}{\partial W^{(2,1,1)}}(out - y)^2 = -1.08 \times \big((.46)(1 - .46)\big) \times .\mathbf{12} = -0.03$
$W^{(2,1,1)}$=-2
$W^{(2,2,1)}$=5
$\frac{\partial}{\partial W^{(2,2,1)}}(out - y)^2 = \frac{\partial}{\partial W^{(2,2,1)}}(out - y)^2 = \frac{\partial\, cost}{\partial out}\frac{\partial\, out}{\partial sum}\frac{\partial\, sum}{\partial W^{(2,2,1)}}$
$= -1.08 \times \big((.46)(1 - .46)\big) \times .\mathbf{82} = -.22$
$b^{(1,1)}$=-7
.12
.82
$b^{(1,2)} = .5$
$W^{(1,2,1)}$=-2
$W^{(1,1,2)} = -3$
$W^{(1,1,1)}$=1
$W^{(1,2,2)} = -2$
1
−2



$$\frac{\partial cost}{\partial h_2} = \frac{\partial cost}{\partial out}\frac{\partial out}{\partial sum}\frac{\partial sum}{\partial h_2} =$$
$$-1.08 \times .46(1 - .46) \times W^{(2,2,1)} = -1.34$$


$y = 1$
.29
$b^{(2,1)} = -4$
.46
$W^{(2,1,1)}$=-2
$W^{(2,2,1)}$=5
$b^{(1,1)}$=-7
.12
.82
$b^{(1,2)} = .5$
$W^{(1,2,1)}$=-2
$W^{(1,1,2)} = -3$
$W^{(1,1,1)}$=1
$W^{(1,2,2)} = -2$
1
−2
$\frac{\partial cost}{\partial h_2} = \frac{\partial cost}{\partial out}\frac{\partial out}{\partial sum}\frac{\partial sum}{\partial h_2} =$
$-1.08 \times .46(1 - .46) \times W^{(2,2,1)} = -1.34$
$\frac{\partial cost}{\partial W^{(1,2,2)}} = \frac{\partial cost}{\partial h_2}\frac{\partial h_2}{\partial sumh1}\frac{\partial sumh1}{\partial W^{(1,2,2)}} =$
$-1.34 \times .82(1 - .82) \times x_2 = .40$


$y = 1$
.29
$\frac{\partial}{\partial out}(out - y)^2 = 2(out - y) = -1.08$
$b^{(2,1)} = -4$
.46
$-1.08 \times 46(1 - .46) \times W^{(2,1,1)} = 0.53$
$W^{(2,1,1)}$=-2
$W^{(2,2,1)}$=5
$\frac{\partial cost}{\partial h_2} = \frac{\partial cost}{\partial out}\frac{\partial out}{\partial sum}\frac{\partial sum}{\partial h_2} =$
$-1.08 \times .46(1 - .46) \times W^{(2,2,1)} = -1.34$
$b^{(1,1)}$=-7
.12
.82
$b^{(1,2)} = .5$
$W^{(1,2,1)}$=-2
$W^{(1,1,2)} = -3$
$W^{(1,1,1)}$=1
$W^{(1,2,2)} = -2$
$\frac{\partial cost}{\partial x_2} = \frac{\partial cost}{\partial h_1}\frac{\partial h_1}{\partial sumh1}\frac{\partial sumh1}{\partial x_2} + \frac{\partial cost}{\partial h_2}\frac{\partial h_2}{\partial sumh2}\frac{\partial sumh2}{\partial x_2}$
$= 0.53 \times (.12)(1 - .12) \times -2 + \ -1.34 \times (.82)(1 - .82) \times -2$
$= 0.28$
1
-2