$$\frac{L_{MSE}}{\partial W_3} = \frac{(y-y')^2}{\partial y'} * \frac{\text{linear}(\tanh\left(linear\left(W_2, b_2, \tanh\left(linear(W_1, b_1, x)\right)\right)\right), W3,\ b)}{\partial W_3} =$$
$$= -2 * (y-y') * \tanh\left(linear\left(W_2, b_2, \tanh\left(linear(W_1, b_1, x)\right)\right)\right)$$

$$\frac{L_{MSE}}{\partial W_2} = \frac{(y-y')^2}{\partial y'} * \frac{linear\left(W_3, b_3, \tanh\left(linear\left(W_2, b_2, \tanh\left(linear(W_1, b_1, x)\right)\right)\right)\right)}{\partial \tanh\left(linear\left(W_2, b_2, \tanh\left(linear(W_1, b_1, x)\right)\right)\right)} * \frac{\tanh\left(linear\left(W_2, b_2, \tanh\left(linear(W_1, b_1, x)\right)\right)\right)}{\partial linear(W_2, b_2, \tanh(W_1, b_1, x))} *$$

$$* \frac{linear\left(W_2, b_2, \tanh\left(linear(W_1, b_1, x)\right)\right)}{\partial W_2} =$$

$$= \frac{(y-y')^2}{\partial y'} * W_3 * \frac{\tanh\left(linear\left(W_2, b_2, \tanh\left(linear(W_1, b_1, x)\right)\right)\right)}{\partial linear(W_2, b_2, \tanh(W_1, b_1, x))} * \tanh\left(linear(W_1, b_1, x)\right)$$

$$\frac{L_{MSE}}{\partial W_1} = \frac{(y-y')^2}{\partial y'} * \frac{linear\left(W_3, b_3, \tanh\left(linear\left(W_2, b_2, \tanh\left(linear(W_1, b_1, x)\right)\right)\right)\right)}{\partial \tanh\left(linear\left(W_2, b_2, \tanh\left(linear(W_1, b_1, x)\right)\right)\right)} * \frac{\tanh\left(linear\left(W_2, b_2, \tanh\left(linear(W_1, b_1, x)\right)\right)\right)}{\partial linear(W_2, b_2, \tanh(W_1, b_1, x))} *$$

$$* \frac{linear\left(W_2, b_2, \tanh\left(linear(W_1, b_1, x)\right)\right)}{\partial \tanh(W_1, b_1, x)} * \frac{\tanh\left(linear(W_1, b_1, x)\right)}{\partial linear(W_1, b_1, x)} * \frac{linear(W_1, b_1, x)}{\partial W_1} =$$

$$= \frac{(y-y')^2}{\partial y'} * W_3 * \frac{\tanh\left(linear\left(W_2, b_2, \tanh\left(linear(W_1, b_1, x)\right)\right)\right)}{\partial linear(W_2, b_2, \tanh(W_1, b_1, x))} * W_2 * \frac{\tanh\left(linear(W_1, b_1, x)\right)}{\partial linear(W_1, b_1, x)} * x$$

$$\frac{L_{MSE}}{\partial b_3} = \frac{(y-y')^2}{\partial y'} * \frac{\text{linear}(\tanh\left(linear\left(W_2, b_2, \tanh\left(linear(W_1, b_1, x)\right)\right)\right), W3,\ b_3)}{\partial b_3} =$$
$$= -2 * (y - y')$$

$$\frac{L_{MSE}}{\partial b_2} = \frac{(y-y')^2}{\partial y'} * \frac{linear\left(W_3, b_3, \tanh\left(linear\left(W_2, b_2, \tanh\left(linear(W_1, b_1, x)\right)\right)\right)\right)}{\partial \tanh\left(linear\left(W_2, b_2, \tanh\left(linear(W_1, b_1, x)\right)\right)\right)} * \frac{\tanh\left(linear\left(W_2, b_2, \tanh\left(linear(W_1, b_1, x)\right)\right)\right)}{\partial linear(W_2, b_2, \tanh(W_1, b_1, x))} *$$

$$* \frac{linear\left(W_2, b_2, \tanh\left(linear(W_1, b_1, x)\right)\right)}{\partial b_2} =$$

$$= \frac{(y-y')^2}{\partial y'} * 1 * \frac{\tanh\left(linear\left(W_2, b_2, \tanh\left(linear(W_1, b_1, x)\right)\right)\right)}{\partial linear(W_2, b_2, \tanh(W_1, b_1, x))} * 1$$

$$\frac{L_{MSE}}{\partial b_1} = \frac{(y-y')^2}{\partial y'} * \frac{linear\left(W_3, b_3, \tanh\left(linear\left(W_2, b_2, \tanh\left(linear(W_1, b_1, x)\right)\right)\right)\right)}{\partial \tanh\left(linear\left(W_2, b_2, \tanh\left(linear(W_1, b_1, x)\right)\right)\right)} * \frac{\tanh\left(linear\left(W_2, b_2, \tanh\left(linear(W_1, b_1, x)\right)\right)\right)}{\partial linear(W_2, b_2, \tanh(W_1, b_1, x))} *$$

$$* \frac{linear\left(W_2, b_2, \tanh\left(linear(W_1, b_1, x)\right)\right)}{\partial \tanh(W_1, b_1, x)} * \frac{\tanh\left(linear(W_1, b_1, x)\right)}{\partial linear(W_1, b_1, x)} * \frac{linear(W_1, b_1, x)}{\partial b_1} =$$

$$= \frac{(y-y')^2}{\partial y'} * 1 * \frac{\tanh\left(linear\left(W_2, b_2, \tanh\left(linear(W_1, b_1, x)\right)\right)\right)}{\partial linear(W_2, b_2, \tanh(W_1, b_1, x))} * 1 * \frac{\tanh\left(linear(W_1, b_1, x)\right)}{\partial linear(W_1, b_1, x)} * 1$$