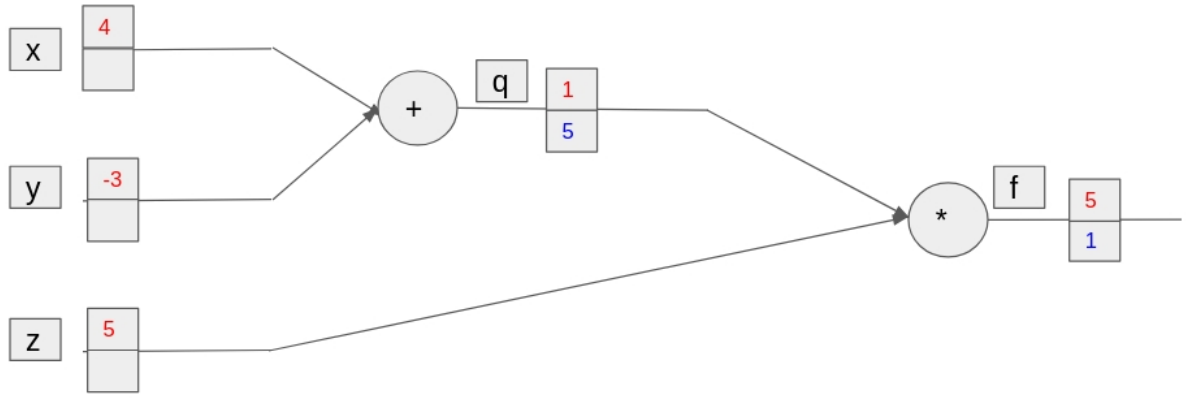
Backpropagation by hand



Given the computational graph above, we want to calculate the derivatives for the leaf nodes (x, y and z). To get you started we already calculated the results of the forward pass (in red) in addition to calculating the derivatives of f and q.

The rules for derivative computations have been given in the table below:

Interaction	Overall Change
Addition	$(f+g)' = f' + g'$
Multiplication	$(f \cdot g)' = f \cdot dg + g \cdot df$
Powers	$(x^n)' = \frac{d}{dx} x^n = nx^{n-1}$
Inverse	$(\frac{1}{x})' = -\frac{1}{x^2}$
Division	$(\frac{f}{g})' = (df \cdot \frac{1}{g}) + (\frac{-1}{g^2} dg \cdot f)$

Possible Answers

- The Derivative of x is 5, the derivative of y is 5, the derivative of z is 1.

  press1

- The Derivative of x is 5, the derivative of y is 5, the derivative of z is 5.

  press2

- The Derivative of x is 8, the derivative of y is -3, the derivative of z is 0.

  press3

- Derivatives are lame, integrals are cool.

Press

Congratulations, you know how to compute derivatives! While PyTorch computes derivatives for you, mastering them will make you a much better deep learning practitioner and that knowledge will guide you in training neural networks better.