Water temperature affects the growth rate of brook trout. The table shows the amount of weight gained by brook trout after 24 days in various water temperatures.[1]

Temperature (C°)	15.5	17.7	20.0	22.4	24.4
Weight gained (g)	37.2	31.0	19.8	9.7	-9.8

If $W(x)$ is the weight gain at temperature x, construct a table of estimated values for W' and sketch its graph. What are the units for $W'(x)$?

For values of the temperature *not* at the endpoints, we'll use the symmetric difference quotient to estimate the IROC, $W'(x)$.

$$W'(17.7) \approx \frac{19.8 - 37.2}{20.0 - 15.5} \approx -3.8667$$
$$W'(20.0) \approx \frac{9.7 - 31.0}{22.4 - 17.7} \approx -4.5319$$
$$W'(22.4) \approx \frac{-9.8 - 9.7}{24.4 - 20.0} \approx -6.7273$$

For values of the temperature at the endpoints, we'll estimate the IROC with a one-sided difference quotient.

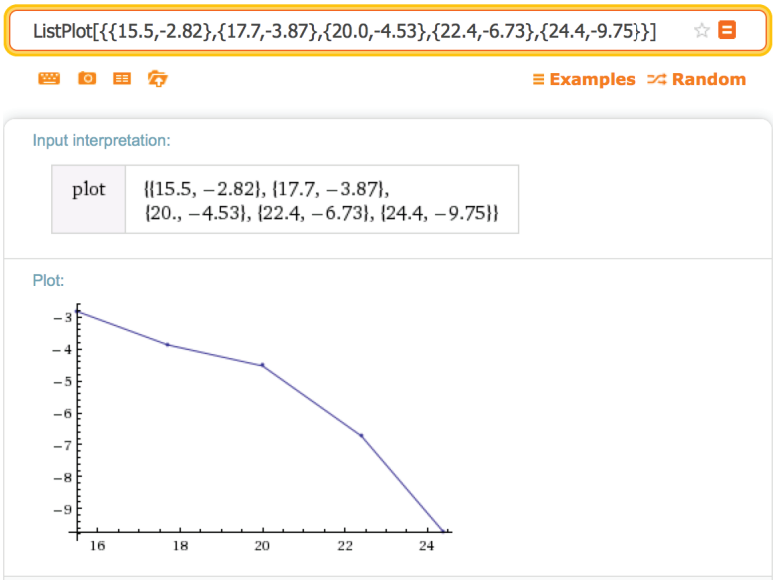
$$W'(15.5) \approx \frac{31.0 - 37.2}{17.7 - 15.5} \approx -2.8182$$
$$W'(24.4) \approx \frac{-9.8 - 9.7}{24.4 - 22.4} = -9.75$$

Let's put these values into one table.

Temperature (C°)	15.5	17.7	20.0	22.4	24.4
$W'(x)$ $(\frac{\text{g}}{\text{C}^\circ})$	-2.82	-3.87	-4.53	-6.73	-9.75

The units on $W'(x)$ are $\frac{\text{g}}{\text{C}^\circ}$.

The graph is shown below, courtesy of WolframAlpha.



[1] Stewart, *Calculus, Early Transcendentals*, p. 163, #38.