

INTERPOLATION: The easy way to estimate between points, and a skill every scientist should have.

Especially when finding the pH at a half-equivalence point, you may need to interpolate between the two closest points to get an accurate value, since you're unlikely to have a point at the correct volume.

Let's say your half-equiv. pt volume is 21.75 mL, but your nearest points to this volume are (21.25 mL, pH=5.02) and (23.25 mL, pH=5.42). To find the pH at 21.75mL, find the differences between the values on lines 1 and 2, and compare to the differences between lines 1 and 3:

		mL	pH	
line 1		21.25	5.02	
	21.75-21.25 = 0.50		(x - 5.02)	
line 2	23.25-21.25=2.00	21.75	x	5.42-5.02 = 0.40
line 3		23.25	5.42	

$$\text{Then } \frac{0.50}{2.00} = \frac{(x - 5.02)}{0.40} \quad \text{so } (x - 5.02) = 0.40 * 0.50 / 2.00 = 0.10, \\ \text{and therefore } x = 5.12$$

In other words, 21.75 is 1/4 the distance from 21.25 to 23.25, so the desired pH should also be 1/4 of the way between 5.02 and 5.42.