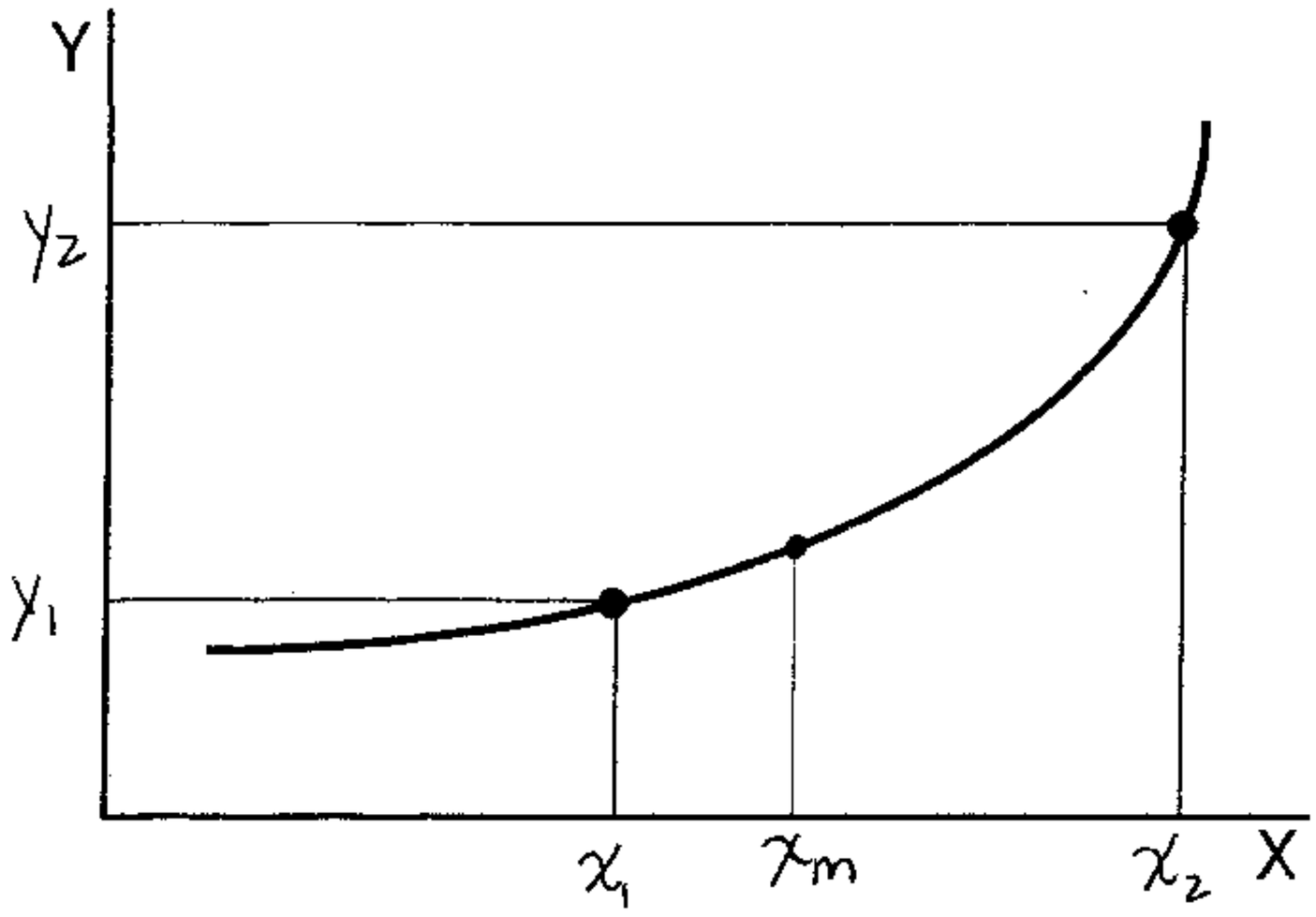
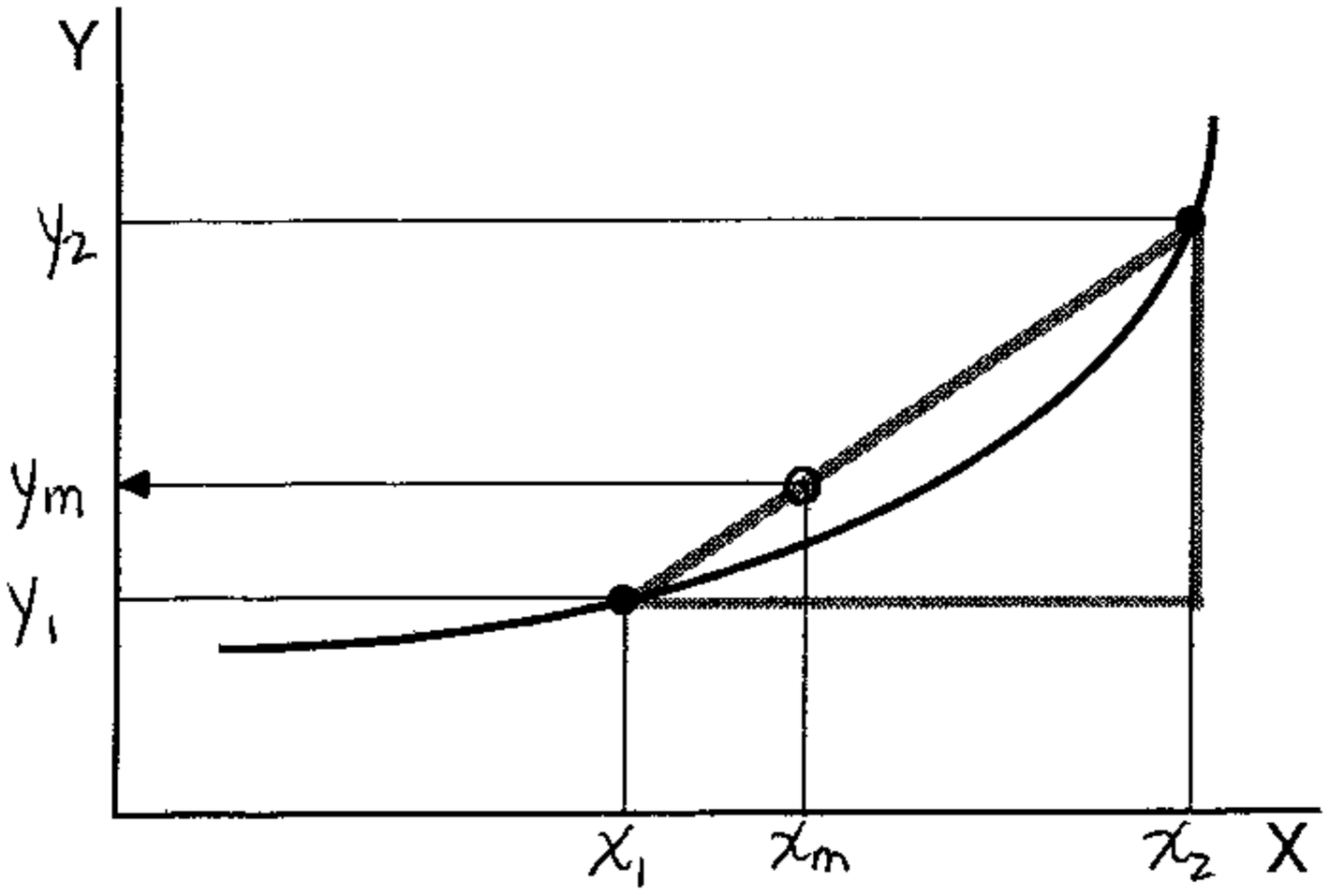
6. Interpolation

Linearity between 2 given data points

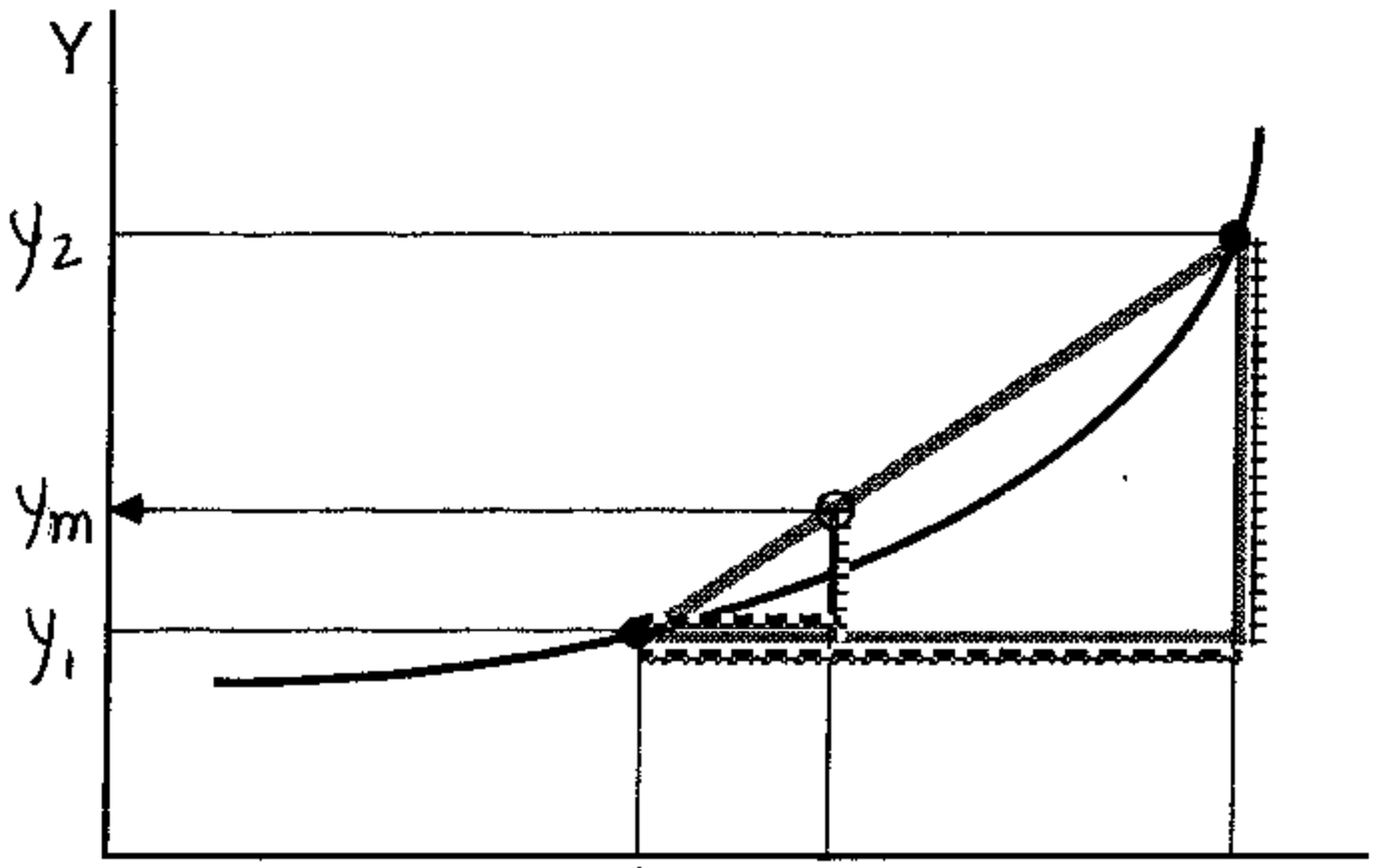


Interpolation



There is some error when assuming function is linear to calculate y_m.

Interpolation



relating similar triangles

$$\frac{base1}{base2} = \frac{height1}{height2} \qquad \frac{x_m - x_1}{x_2 - x_1} = \frac{y_m - y_1}{y_2 - y_1}$$

Interpolation

$$\frac{x_m - x_1}{x_2 - x_1} = \frac{y_m - y_1}{y_2 - y_1}$$

either equation is good – remember, multiplication is commutative

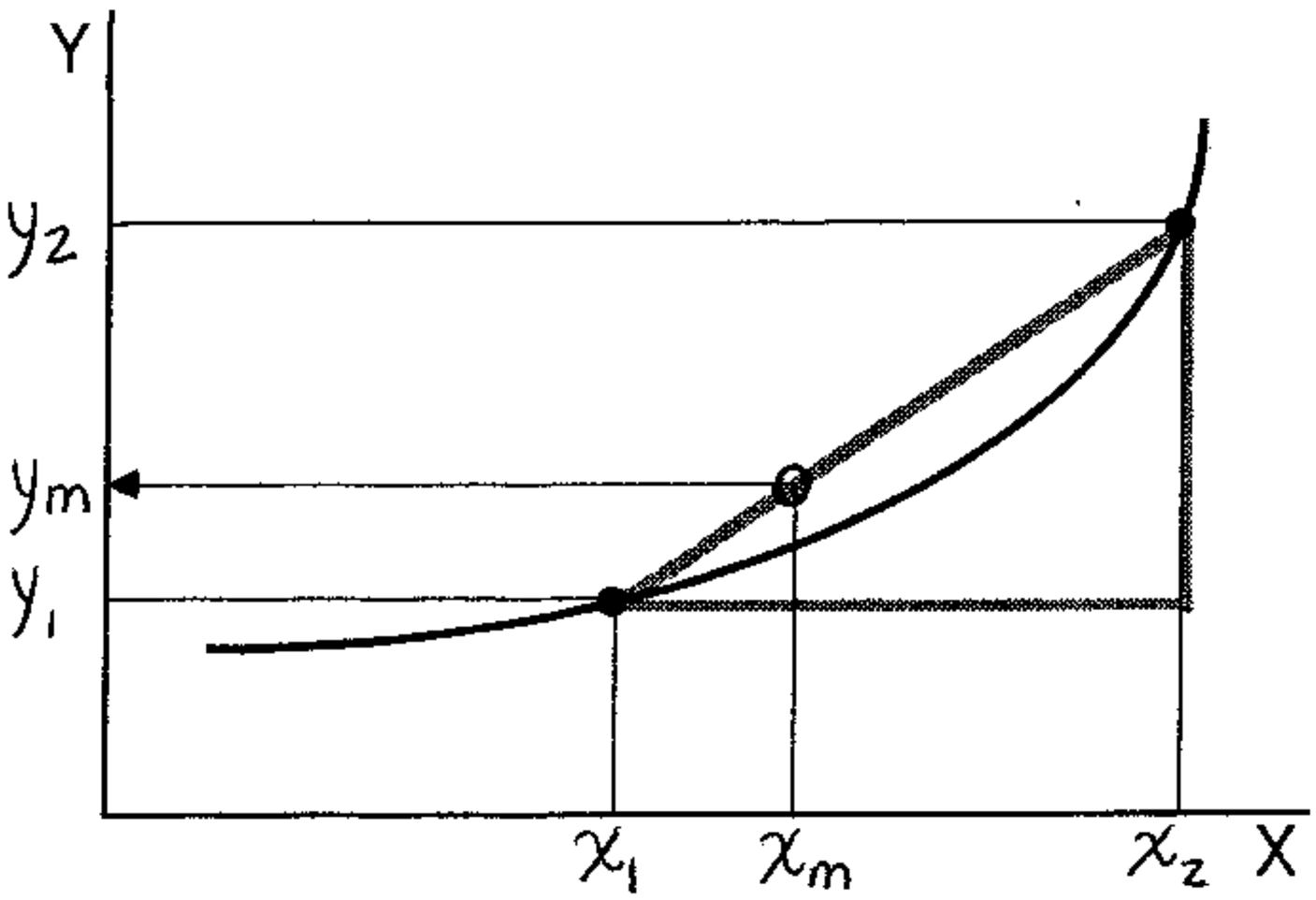
$$y_m = y_1 + \frac{x_m - x_1}{x_2 - x_1}(y_2 - y_1)$$

$$y_m = y_1 + \frac{y_2 - y_1}{x_2 - x_1}(x_m - x_1)$$

$$y_m = y_1 + \frac{dy}{dx}\Delta x$$

Interpolation

$$y_m = y_1 + \frac{dy}{dx}\Delta x$$



* To make thing easier, set up a table

	x (units)	y (units)
(1)	x_1	y_1
(2)	x_2	y_2
(m)	x_m	y_m

y_m is the unknown value.

x_1, x_2, y_1, y_2 are values read from the thermodynamic tables.

x_m is the known valve, but it is in between values in the thermo tables.