Solution 17.7

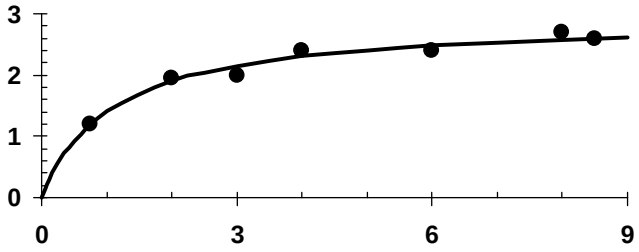
(a) We regress $1/y$ versus $1/x$ to give

$$\frac{1}{y} = 0.34154 + 0.36932\frac{1}{x}$$

Therefore, $\alpha_3 = 1/0.34154 = 2.927913$ and $\beta_3 = 0.36932(2.927913) = 1.081337$, and the saturation-growth-rate model is

$$y = 2.927913\frac{x}{1.081337 + x}$$

The model and the data can be plotted as



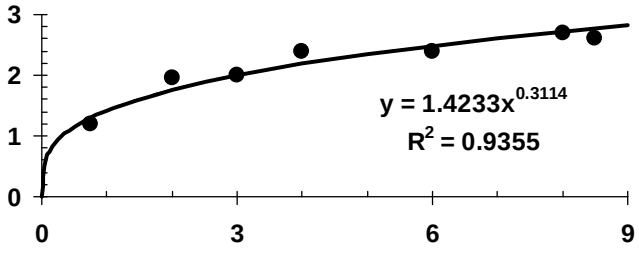
(b) We regress $\log_{10}(y)$ versus $\log_{10}(x)$ to give

$$\log_{10} y = 0.153296 + 0.311422\log_{10} x$$

Therefore, $\alpha_2 = 10^{0.153296} = 1.423297$ and $\beta_2 = 0.311422$, and the power model is

$$y = 1.423297x^{0.311422}$$

The model and the data can be plotted as



Solution continued on the next page...

(c) Polynomial regression can be applied to develop a best-fit parabola

$y = -0.03069x^2 + 0.449901x + 0.990728$

The model and the data can be plotted as