

(19) $y = a e^{bx}$

$10 = a e^{b \cdot 0}$

$10 = a$

$y = 10 e^{bx}$

$5 = 10 e^{1599b}$

$\ln \frac{1}{2} = \ln e^{1599b}$

$\ln \frac{1}{2} = 1599b$

$b \approx -0.00043$

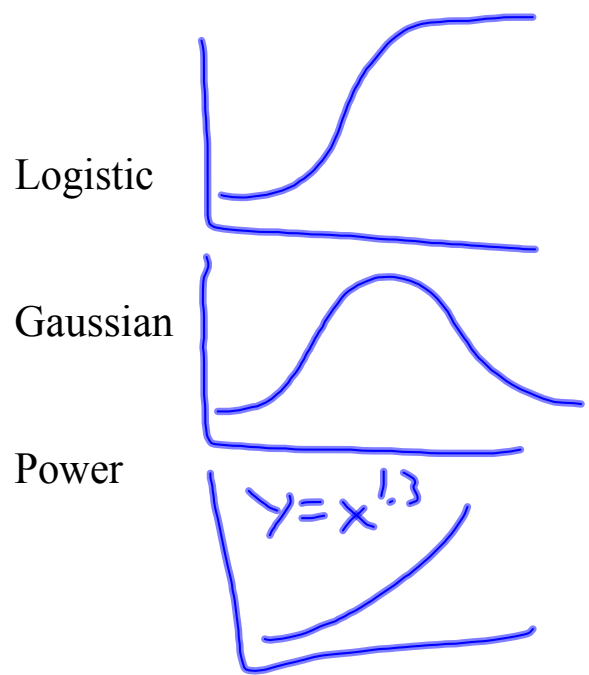
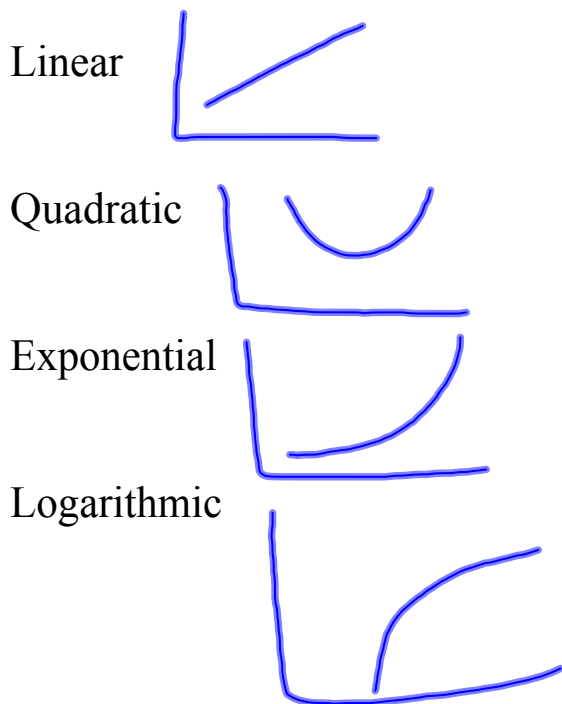
$y = 10 e^{-0.0043x}$

$y = 10 e^{(-0.0043 \cdot 1000)}$

$(0, 10)$

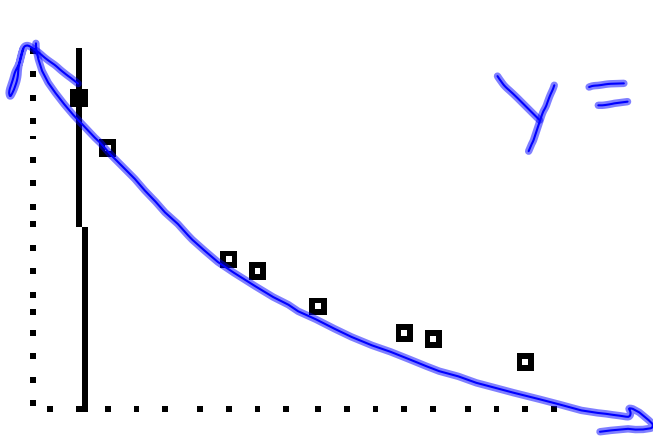
$(1599, 5)$

3-6 Nonlinear Models



Ex 1 What type of model should you use for the following data?

(2, 28.0) (3, 25.6) (7, 20.6) (8, 19.9)
 (10, 18.5) (13, 17.0) (14, 16.8) (17, 15.7)



$$y = 28.2 \cdot .96^x$$

```
ExpReg
y=a*b^x
a=28.23117606
b=.9627834054
r^2=.9492829076
r=-.9743115044
```

Ex 2 Fit the data from example 1 to logarithmic and linear models. Compare the r^2 values and determine the best fit.

.999

.91

Ex 3 Find the model that best fits the data. Then predict the kinetic energy if the speed is 3.0 m/s.

Speed (m/s)	Kinetic energy (N)
0.9	0.016
1.0	0.019
1.5	0.040
1.8	0.061
2.1	0.087
2.2	0.092
2.4	0.111

Homework
p.242
#1-21 odds