p. 477-481
2, 3, 5, 13-18, 20, 23, 31

(11.7)

2.) Find formula for exponential:

x	2	3	4	5
h(x)	4.5948	7.4744	10.5561	13.7973

$h(x) = 2.35(1.44)^x$

3.) Find formula for the power function for same values:

$g(x) = 2x^{1.2}$

5.) a.) Power Function:

$f(x) = 201.353x^{2.111}$

b.) weight of tree with dbh of 20 cm:

USING "VALUE" ON GRAPH:

112,468.27 g -or-

$201.353(20)^{2.111} = 112,313.62$ g

c.) DBH for dry weight of 100,000 gm?

INTERSECTION ON GRAPH:

18.917 cm -or-

$100,000 = 201.353x^{2.111}$

$\frac{100,000}{201.353} = x^{2.111}$

$\left(\frac{100,000}{201.353}\right)^{\frac{1}{2.111}} = x$ (take $\sqrt[2.111]{}$)

$18.930 \text{ cm} = x$

9.) $m = \frac{3}{2}$ $b = 0$

$y = \frac{3}{2}x$

13.) a.) Linear regression yields

$y = 61.514x - 83.039$

The fit is excellent as the correlational coefficient is .99997

b.) The linear function only fits the power function $y = 5x^3$ so well on this interval because it is zoomed in so much.

18.) a.) Decreasing Function and Concave Up {amount of decrease is slowing}

b.) $y = 2.976 \cdot t^{-.002}$ {Power regression using 1 for 2006}

c.) 2012 Population $t = 7$

$y = 2.976(7)^{-.002} =$ 2.964 million

{Graph Yields The Same}

(a)

20.) The curve $y = -.330x^2 + 7.00x + 5.462$ does not fit as well as (b) the cubic function $y = -.145x^3 + 1.850x^2 - 1.313x + 10.692$ fits it almost perfectly.

23.) a.) $N = 1148.53(1.439)^t$

CONVERTING TO CONTINUOUS $\Rightarrow ae^{kt}$

$1.439^t = e^{kt}$

$1.438141516^t = (e^k)^t$

$1.438141516 = e^k$

$\ln 1.438141516 = \ln(e^k)$

$.3617 = k$

So $N = 1148.53e^{.3617t}$

b.) Doubling Time?

$2(1148.53) = 1148.53e^{.3617t}$

$2 = e^{.3617t}$

$\ln 2 = \ln e^{.3617t}$

$\frac{\ln 2}{.3617} = \frac{.3617t}{.3617}$

$1.916 = t$

31.)

H, °C	10.7	14.4	16.2	18.1	21.4	23.7	24.7	26.9	L_1
t, days	38.0	19.5	15.6	9.6	9.5	7.3	4.5	4.5	L_2
$r\left(\frac{1}{t}\right)$									L_3 = Just set $L_3 = \frac{1}{L_2}$

a.) Power Function : $\boxed{t = 8966.092H^{-2.301}}$ {Power Regression 2

b.) Linear Function r against H – Arrow up to $L3$ and set it equal to $1 \div L_2$. Then linear regression ($\#4, L_1, L_3, Y_1$)

$y = .0124x - .1248$

or

$\boxed{r = .0124H - .1248}$

c.) At what temperature does r drop to zero in:

part a? $r = \frac{1}{t}$, so $r \to 0$ as $t \to \infty$ and $t \to \infty$ as $H \to 0$, therefore r will reach 0 when H reaches 0.

part b?

$0 = .0124H - .1248$

$.1248 = .0124H$

$\boxed{10^\circ \approx H}$ ← More reasonable