Precalculus Worksheet #2 Chapter 4 Selected Solutions

Solve each of the following problems. Show all of your work neatly organized. (Round off to 3 significant digits, where appropriate.)

3. A computer that costs $1800 new has a depreciated value of $900 after 5 years.

a. Express the depreciated value of the computer as a function of time using the model $V = Ce^{kt}$.

Since the 'value' of the computer was $1800 when it was 'new', V = 1800 when t = 0.

$$V = Ce^{kt}$$
$$1800 = Ce^{0}$$
$$C = 1800$$
$$V = 1800e^{kt}$$

Since the value was $900 after 5 years, $900 = 1800e^{5k}$

$$e^{5k} = 0.5$$
$$5k = \ln 0.5$$
$$k = (\ln 0.5)/5 \approx -0.139$$
$$\underline{V \approx 1800e^{-0.139t}}$$

b. Use your model to approximate the depreciated value of the computer after 7 years.

When t = 7 years, $V \approx 1800e^{[(-0.139)(7)]}$

$$V \approx 680$$

<u>The value will be about $680 after 7 years.</u>