Chapter 12 Practice Test

1

If $f(x)=\sqrt{2x}$ and $g(x)=2x^2$, what is the value of $f(g(1))-g(f(1))$?

A) –4

B) –2

C) 2

D) 4

2

If $f(x)=\sqrt{625-x^2}$ and $g(x)=\sqrt{225-x^2}$, what is the value of $f(f(5))-g((g5))$?

A) 0

B) 5

C) 10

D) 20

3

The population of a certain town doubles every 25 years. If the population of the town was 51,200 in 1980, in what year was the population 6,400?

A) 1855

B) 1880

C) 1905

D) 1930

4

The half-life of a radioactive substance is the amount of time it takes for half of the substance to decay. The table below shows the time (in years) and the amount of substance left for a certain radioactive substance.

Time (years)	Amount (grams)
0	1,200
14	850
28	600
42	425
56	300

How much of the original amount of the substance, to the nearest whole gram, will remain after 140 years?

A) 85

B) 75

C) 53

D) 38

5

A radioactive substance decays at a rate of 18% per year. If the initial amount of the substance is 100 grams, which of the following functions models the remaining amount of the substance, in grams, after t years?

A) $f(t)=100(0.18)^t$

B) $f(t)=100(0.82)^t$

C) $f(t)=100-100(0.18)^t$

D) $f(t)=100-100(0.82)^t$

6

$$5,000(1+\frac{r}{100})^t$$

The expression above gives the value of an investment, in dollars, that pays an annual interest rate of r% compounded yearly. 5,000 is the initial amount and t is the number of years after the initial amount was deposited. Which of the following expressions shows the difference between the value of a 15 year investment at 6% annual compound interest and a 12 year investment at 6% annual compound interest?

A) $5,000\left[(1.06)^{\frac{15}{12}}\right]$

B) $5,000\left[\frac{(1.06)^{15}}{(1.06)^{12}}\right]$

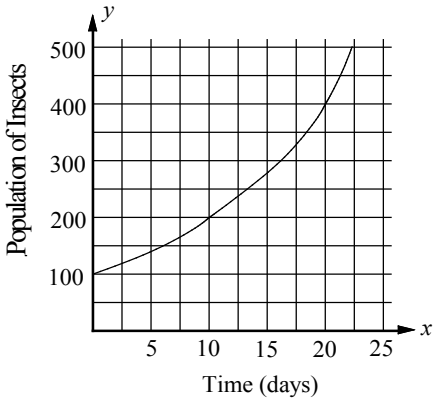
C) $5,000\left[(1.06)^{15}-(1.06)^{12}\right]$

D) $5,000\left[(1.06)^{15-12}\right]$

7

The price P, in dollars, of a truck t years after it was purchased is given by the function $P(t)=24,000(\frac{1}{2})^{\frac{t}{6}}$. To the nearest dollar, what is the price of the truck 9 years after it was purchased?

Questions 8 and 9 refer to the following information.



The graph above shows the size of a certain insect population over 25 days. The population at time $t=0$ was 100. A biologist used the equation $f(t)=100(2)^{\frac{t}{d}}$ to model the population.

8

What is the value of d in the equation?

9

What was the population of the insect after 15 days, to the nearest whole number?