

Precalculus Spiral Review 6

1. Which expression represents $f[g(x)]$ if $f(x) = x^2 + 4x + 3$ and $g(x) = x - 5$?

A $x^2 + 4x - 2$
 B $x^2 - 6x + 8$
 C $x^2 - 9x + 23$
 D $x^2 - 14x + 6$

2. **SAT/ACT** Which of the following *most* accurately describes the translation of the graph $y = (x + 4)^2 - 3$ to the graph of $y = (x - 1)^2 + 3$?

A down 1 and to the right 3
 B down 6 and to the left 5
 C up 1 and to the left 3
 D up 1 and to the right 3
 E up 6 and to the right 5

3. **SAVINGS** You deposited \$1000 into an account that pays an annual interest rate r of 5% compounded quarterly.

Use $A = P\left(1 + \frac{r}{n}\right)^{nt}$.

- a. How long will it take until you have \$1500 in your account?
 b. How long it will take for your money to double?

4. **SAVINGS** If you deposit \$2000 in an account paying 6.4% interest compounded continuously, how long will it take for your money to triple? Use $A = Pe^{rt}$.

5. **AGRICULTURE** An equation that models the decline in the number of U.S. farms is $y = 3,962,520(0.98)^x$, where x is the number of years since 1960 and y is the number of farms.

- a. How can you tell that the number is declining?
 b. By what annual rate is the number declining?
 c. Predict when the number of farms will be less than 1 million.

6. **WHICH ONE DOESN'T BELONG?** Find the expression that does not belong. Explain.

$\log_4 16$

$\log_2 16$

$\log_2 4$

$\log_3 9$

- 7.

What is the y -intercept of the exponential function below?

$$y = 4^x - 1$$

A 0 B 1 C 2 D 3

8. Suppose there are only 3500 birds of a particular endangered species left on an island and the population decreases at a rate of about 5% each year. The logarithmic function $t = \log_{0.95} \frac{P}{3500}$ predicts how many years t it will be for the population to decrease to a number P . About how long will it take for the population to reach 3000 birds?

F 2 years H 5 years
 G 3 years J 8 years

- 9.

MULTIPLE CHOICE Which of the following is *not* correct?

(A) $\log_2 24 = \log_2 6 + \log_2 4$ (B) $\log_2 24 = \log_2 72 - \log_2 3$
 (C) $\log_2 24 = \log_2 8 + \log_2 16$ (D) $\log_2 24 = 2 \log_2 2 + \log_2 6$

MULTIPLE CHOICE Which of the following is equivalent to $\log_5 8$?

10. (A) $\frac{\log 5}{\log 8}$ (B) $\frac{\log 8}{\log 5}$ (C) $\frac{\ln 8}{\ln 5}$ (D) $\frac{\ln 13}{\ln 5}$ (E) Both B and C