Solutions for In-Class Problems 15 for Monday, March 26

These problems are from Pre-Class Problems 15.

1. If \$100,000.00 is invested at a rate of 6% per year, then determine the amount in the investment at the end of 4 years for the following compounding options.

   a. compounded quarterly

   b. compounded monthly

   c. compounded daily

   d. compounded continuously

2. Sketch the graph of the following functions. State the domain of the function and use the sketch to state the range of the function.

   a. $f(x) = \log_{1/4}(x + 3) + 8$

   b. $g(t) = 2\ln(-t) - 4$

   c. $y = -\dfrac{2}{3}\log(x - 2) + 5$

3. Find the domain of the following functions.

   a. $f(x) = \log_5(x^2 - 5x + 6)$

   b. $y = \log_{3/4}(7x + 3)^2$

SOLUTIONS:

1a. compounded quarterly

Back to Problem 1.

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

$P = \$100{,}000.00$, $r = 6\% = 0.06$, $n = 4$, and $t = 4$

$$A = 100000\left(1 + \frac{0.06}{4}\right)^{4(4)} = 100000(1 + 0.015)^{16} =$$

$$100000\ (1.015)^{16} = 126898.55$$

Answer: $126,898.55

1b. compounded monthly Back to Problem 1.

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

$P = \$100{,}000.00$, $r = 6\% = 0.06$, $n = 12$, and $t = 4$

$$A = 100000\left(1 + \frac{0.06}{12}\right)^{12(4)} = 100000(1 + 0.005)^{48} =$$

$$100000\ (1.005)^{48} = 127048.92$$

Answer: $127,048.92

1c. compounded daily Back to Problem 1.

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

$P = \$100{,}000.00$, $r = 6\% = 0.06$, $n = 365$, and $t = 4$

$$A = 100000\left(1 + \frac{0.06}{365}\right)^{365(4)} = 100000\left(1 + \frac{0.06}{365}\right)^{1460} = 127122.41$$

Answer: $127,122.41

1d. compounded continuously Back to Problem 1.

$A = Pe^{rt}$

$P = \$100{,}000.00$, $r = 6\% = 0.06$, and $t = 4$

$A = 100000e^{0.06(4)} = 100000e^{0.24} = 127124.92$

Answer: \$127,124.92

2a. I owe you the solution.

2b. I owe you the solution. Back to Problem 2.

2c. I owe you the solution.

3a. I owe you the solution.

Back to Problem 3.

3b. I owe you the solution.