BECA / Huson / Algebra 2: Exponentials Jan 2023 Regents Name:
4 April 2024

Regents problems: Polynomials

1. To the *nearest tenth*, the solution to the equation $4300e^{0.07x} - 123 = 5000$ is
   (a) 1.1
   (b) 2.5
   (c) 6.3
   (d) 68.5

2. The value of an automobile t years after it was purchased is given by the function $V = 38000(0.84)^t$. Which statement is true?
   (a) The value of the car increases 84% each year.
   (b) The value of the car decreases 84% each year.
   (c) The value of the car increases 16% each year.
   (d) The value of the car decreases 16% each year.

3. Which function represents exponential decay?
   (a) $p(x) = \left(\frac{1}{4}\right)^x$
   (b) $q(x) = 1.8^{-x}$
   (c) $r(x) = 2.3^{2x}$
   (d) $s(x) = 4^{\frac{x}{2}}$

4. For which approximate value(s) of x will $\log(x+5) = |x-1| - 3$?
   (a) $5, 1$
   (b) $-2.41, 0.41$
   (c) $-2.41, 5$
   (d) 5, only

5. Mia has a student loan that is in deferment, meaning that she does not need to make payments right now. The balance of her loan account during her deferment can be represented by the function $f(x) = 35,000(1.0325)^x$, where x is the number of years since the deferment began. If the bank decides to calculate her balance showing a monthly growth rate, an approximately equivalent function would be
   (a) $f(x) = 35,000(1.0027)^{12x}$

(b) $f(x) = 35,000(1.0027)^{\frac{x}{12}}$

(c) $f(x) = 35,000(1.0325)^{12x}$

(d) $f(x) = 35,000(1.0325)^{\frac{x}{12}}$