## Quiz 3

Show all your work. Reasonable supporting work must be shown to earn credit. There are two sides to this quiz.

1. [3] (ExponentActivity pg2) Simplify: $\frac{-1}{9}^{2} x^{2} y^{3}\left(3 x^{3}\right)^{2}$
2. (WebHW8 \#30) It is known that the population ( $P$ measured in thousands) of a bug is modeled well by $P(t)=\frac{16}{3+a e^{k t}}$ where $a$ and $k$ are determined locally in geographic regions. In this region measurements have confirmed that $P(0)=2$ and $P(1)=\frac{1}{2}$.
(a) [1] Are the population of bugs increasing or decreasing?
(b) [3] Find $a$ and $k$ so that you have a model of the bug's population for our local region.
3. The graph to the right is the graph of the form $f(x)=\log _{b}(x)$
(a) [1] (WebHW7 \#20) What is the domain?

(b) $[2](\S 3.2 \# 72)$ Find $b$ to write the explicit rule/expression for $f$.
