

3. [14 points] Kiki and her pet mouse Mimi (who is now the size of a small dog via size-change technology) like to go to the park and play frisbee. Suppose after t minutes of playing frisbee at the park, Mimi's satisfaction level, in pleasits (a unit of satisfaction) is given by an exponential function $M(t)$ whose values are given in the table below.

t	1	2	3	4
$M(t)$	$9/2$			$32/3$

Express all answers for all parts of this problem in **exact form**.

- a. [4 points] Find the growth factor for $M(t)$ and fill in the missing values of $M(t)$ in the table.

The growth factor for $M(t)$ is _____.

- b. [4 points] If Mimi never plays frisbee for more than 30 minutes, find the domain and range of $M(t)$.

The domain of $M(t)$ is _____.

The range of $M(t)$ is _____.

- c. [3 points] Kiki's satisfaction level in pleasits, $Q(t)$, t minutes after she starts playing frisbee is an exponential function, $Q(t) = 10e^{0.02t-2}$. Is $Q(t)$ an exponential growth function or an exponential decay function? **Circle** GROWTH or DECAY in the sentence below and state the *continuous* growth or decay rate either as a decimal or as a percentage.

The *continuous* GROWTH or DECAY rate is _____.

- d. [3 points] Find Kiki's satisfaction level when she first begins playing frisbee, and find the per minute (non-continuous) growth rate of her satisfaction level, $Q(t)$, either as a decimal or as a percentage.

Kiki's satisfaction level is _____ when she first begins playing.

The per minute growth rate of her satisfaction level is _____.