

9. [9 points] A new computer antivirus is available to be downloaded on March 19 at the university's ITS website. The antivirus is only available for students. Let  $T(s)$  be the time (in days after March 19) it takes for  $s$  students to download the antivirus to their personal computers. The function  $T(s)$  is given by

$$T(s) = 20 \log \left( \frac{s}{2} + 1 \right).$$

- a. [3 points] List the transformations required to obtain the graph of  $T(s)$  from the graph of the function  $f(s) = \log(s)$ . Make sure to be precise when you describe each transformation and indicate the order in which they need to be applied.
- b. [2 points] How many days after March 19 are required for a thousand students to download the antivirus to their personal computers? Your answer needs to be exact or rounded up to the nearest .01.

Answer: \_\_\_\_\_

- c. [4 points] How many students have downloaded the antivirus seven days after March 19? Your answer must be found algebraically and written in exact form.

Answer: \_\_\_\_\_