

After watching the video, *Making Sense of Logarithm Properties*, complete the following problems.

1. Find the decimal approximations for the following quantities, using a calculator **only** when needed.

a.  $\log 2$        $\log 3$        $\log 6$        $\log 2 + \log 3$

b.  $\log 6$        $\log 36$        $\log 6 + \log 6$

c.  $\log 6$        $\log 2$        $\log 72$        $\log 6 + \log 6 + \log 2$

2. It is a fact that

$$\log 3 \approx 0.4771$$

$$\log 5 \approx 0.6990$$

$$\log 7 \approx 0.8451$$

Without using a calculator, approximate the following quantities to four decimal places. (Hint: The properties proved in the video *Making Sense of Logarithm Properties* will be useful.)

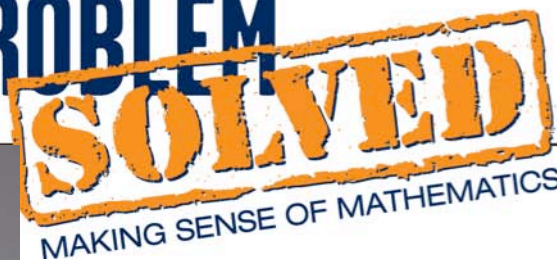
a.  $\log 15$

b.  $\log 35$

c.  $\log 105$

3. Find decimal approximations for the following quantities, using a calculator when needed.

$\log 3$        $\log 3^2$        $2\log 3$



4. Using the facts given in #2, approximate:
  - a.  $\log 243$  (Hint:  $243 = 3^5$ )
  - b.  $\log 45$
  - c.  $\log 5$
  - d.  $\log 7^a$
  
5. Fill in the blanks with the generalization used in the above problems.
  - a.  $\log ab = \underline{\hspace{2cm}}$
  - b.  $\log a^2b = \underline{\hspace{2cm}}$
  
6. Without a calculator, determine if the following are true or false. Explain your reasoning for any false solutions.
  - a.  $\log 5a = \log 5 + \log a$
  - b.  $(\log 2)^3 = \log 8$
  - c.  $\log 25 = 2\log 5$
  - d.  $\log (a+9) = (\log a) (\log 9)$
  - e.  $\log(\sqrt[3]{2+x}) = \frac{\log(2+x)}{3}$