9. Simplify to at most 3 or 4 symbols.
   (a) \( \log_9 \left( \frac{1}{3} \right) = \) 4 symb, chk=3
   
   (b) \( \log_9 (\sqrt{3}) = \) 3 symb, chk=5

Hint for (a): write the argument as a power of the base: solve \( 9^x = \frac{1}{3} \).

Replace the argument of the logarithm with this power of its base: \( \log_9 \left( \frac{1}{3} \right) = \log_9 (9^x) \). Use the fact that \( \log_b b^x = x \).

Alternately, let \( y = \log_9 \left( \frac{1}{3} \right) \). Then \( 9^y = \frac{1}{3} \). Write both sides to base 3. \( (3^2)^y = 3^{-1} \) and solve for \( y \).

Do (b) similarly.

11. \( 3^{x-1} = 2^{x+4} \). Solve for \( x \) using natural logarithms.

   Take the natural logarithm of both sides.

   Bring the exponents inside the logarithm outside. They become coefficients on the outside.

   Use \( \log x^n = n \log x \).

   Get terms involving \( x \) on the left, everything else (the constants) on the right.

   Factor out \( x \) and then divide to solve for \( x \).

   Use the following properties to simplify the answer to a ratio of two logarithms, e.g., \( \frac{\ln 40}{\ln 5/3} \).  

   Log properties

   \( \log_b xy = \log_b x + \log_b y \)

   \( \log_b x/y = \log_b x - \log_b y \)

   \( \log_b x^n = n \log_b x \)