Consider the function

\[ U(r) = \frac{A}{r^4} - \frac{B}{r^2} \]

where \( A \) and \( B \) are parameters with \( A > 0 \) and \( B > 0 \). Functions of something like this form are used in physics and chemistry as a model of the potential energy of interaction between two molecules where \( r \) is the distance between the molecules. The relevant domain is thus \((0, \infty)\).

1. Use the methods of Sections 4.3 through 4.5 to make a plot that shows all of the essential features on the graph of this function for \( r \) in \((0, \infty)\). Note that the scales for your axes will be in terms of the parameters \( A \) and \( B \). You will probably find that the quantity \( \sqrt{A/B} \) is convenient to use as the unit for the \( r \)-axis.

2. Describe how the essential features of the graph change if \( B \) is held constant and \( A \) is changed.

3. Describe how the essential features of the graph change if \( A \) is held constant and \( B \) is changed.