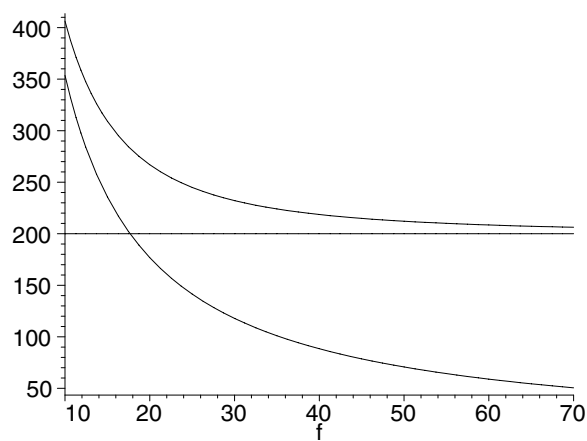


77. (a) With  $f$  understood to be in Hertz, the capacitive reactance is  $X_C = [(2\pi)(45 \times 10^{-6} \text{ F})f]^{-1}$ .
- (b) The resistance, reactance and impedance are plotted over the range  $10 \leq f \leq 70 \text{ Hz}$ . The horizontal line is  $R$ , and the curve that crosses that line is  $X_C$ . SI units are understood.



- (c) From the graph, we estimate the crossing point to be at about 18 Hz. More careful considerations lead to  $f = 17.7 \text{ Hz}$  as the frequency where  $X_C = R$ .