37.30 A refrigerator draws $800W$ of power and absorbs $4000\frac{Btu}{hr}$ from the internal volume. What is the coefficient of performance?

A. 0.7

B. 1.5

C. 1.7

D. 5.0

Look up Coefficient of Performance for a Refrigerator in the reference handbook and use the formula:

$$COP_R = \frac{Q_L}{W}$$

where Q_L is the refrigeration effect i.e. the heat removed from the cold space and W is the work done by the compressor to drive the refrigeration process. Note that the units must cancel completely as the COP should be unitless. Substitute and solve.

$$COP_R = \frac{Q_L}{W} = \frac{4000\frac{Btu}{hr}}{800W\left(3.412\frac{Btu}{hr \cdot W}\right)} = 1.5$$

Answer B