

47.72 A 460-V three phase AC motor rated for 60hp operates with an efficiency of 93% and a power factor of 0.85. How much current will the motor draw?

- A. 60A
- B. 66A
- C. 71A
- D. 123A

Use the first three-phase equation in the table **Power for Different Motor Phases**, where the power rating is given in horsepower. Voltage, power factor, and efficiency are all given. Calculate the current.

$$I_{[amps]} = \frac{P_{[hp]} (746)}{\sqrt{3}V\eta(pf)}$$
$$I_{[amps]} = \frac{(60)(746)}{\sqrt{3}(460)(0.93)(0.85)} = 71A$$

Answer C

47.73 Steam enters a turbine at a pressure of 1000psia and a temperature of 800°F and exits at a pressure of 90psia and a temperature of 400°F. What is the efficiency?

- A. 52%
- B. 67%
- C. 72%
- D. 89%

Consider the entering steam as State 1 and the exit steam as State 2. Both states are fully defined and superheated. Use the properties of **Superheated Steam** tables to look up the enthalpy and entropy for State 1, and the *actual* enthalpy for State 2.

$$P_1 = 1000psia$$

$$T_1 = 800^\circ F$$

$$h_1 = 1389 \frac{Btu}{lb}$$

$$s_1 = 1.567 \frac{Btu}{lb \cdot ^\circ R}$$