8.32 The slope of the line from a log $\dot{\varepsilon}_s$ versus log σ plot yields the value of *n* in Equation 8.19; that is

$$n = \frac{\Delta \log \dot{\varepsilon}_s}{\Delta \log \sigma}$$

We are asked to determine the values of *n* for the creep data at the three temperatures in Figure 8.31. This is accomplished by taking ratios of the differences between two log $\dot{\varepsilon}_s$ and log σ values. (Note: Figure 8.31 plots log σ versus log $\dot{\varepsilon}_s$; therefore, values of *n* are equal to the reciprocals of the slopes of the straight-line segments.)

Thus for 427°C

$$n = \frac{\Delta \log \dot{\varepsilon}_s}{\Delta \log \sigma} = \frac{\log \left(10^{-6}\right) - \log \left(10^{-7}\right)}{\log\ (82\ \text{MPa}) - \log\ (54\ \text{MPa})} = 5.5$$

While for 538°C

$$n = \frac{\Delta \log \dot{\varepsilon}_s}{\Delta \log \sigma} = \frac{\log \left(10^{-5}\right) - \log \left(10^{-7}\right)}{\log\ (59\ \text{MPa}) - \log\ (22\ \text{MPa})} = 4.7$$

And at 649°C

$$n = \frac{\Delta \log \dot{\varepsilon}_s}{\Delta \log \sigma} = \frac{\log \left(10^{-5}\right) - \log \left(10^{-7}\right)}{\log\ (15\ \text{MPa}) - \log\ (8.3\ \text{MPa})} = 7.8$$