problem 17

$$\int \frac{\ln x}{x^2}\, dx$$

Let

$$u = \ln x$$
$$du = \frac{1}{x}\, dx$$
$$dv = \frac{1}{x^2}\, dx$$
$$v = -\frac{1}{x}$$

We get

$$\int \frac{\ln x}{x^2}\, dx = -\frac{\ln x}{x} + \int \frac{1}{x^2}\, dx$$
$$= -\frac{\ln x}{x} - \frac{1}{x}$$
$$= -\frac{1}{x}\,(\ln x + 1)$$

Evaluate from $x = 1 \Rightarrow x = 2$:

$$= -\frac{1}{2}\,(\ln 2 + 1) + 1$$

Check