Solution 23.26

The velocity at the surface can be computed with Eq. (23.9) as

$x_0 = 0$ $f(x_0) = 0$

$x_1 = 0.002$ $f(x_1) = 0.287$

$x_2 = 0.006$ $f(x_2) = 0.899$

$$f'(0) = 0\frac{2(0)-0.002-0.006}{(0-0.002)(0-0.006)} + 0.287\frac{2(0)-0-0.006}{(0.002-0)(0.002-0.006)} + 0.899\frac{2(0)-0-0.002}{(0.006-0)(0.006-0.002)}$$
$$= 0 + 215.25 - 74.9167 = 140.3333$$

Therefore, the shear stress can be computed as

$$\tau = 1.8\times10^{-5}\frac{\text{N}\cdot\text{s}}{\text{m}^2}140.3333\frac{1}{\text{s}} = 0.00253\frac{\text{N}}{\text{m}^2}$$