

§5.5 #5, 5, 6, 9, 13, 15, 20

\*8  $h(r) = \frac{3}{(1+r)^2}$  Find  $f_{\text{AVG}}$  on  $[1, 6]$

$$f_{\text{AVG}} = \frac{1}{6-1} \int_1^6 3(1+r)^{-2} dr = \frac{3}{5} \int_1^6 (1+r)^{-2} dr$$

$$\begin{aligned} \underline{u=1+r} & \quad r=1 \Rightarrow u=1+1=2 \\ \underline{du=dr} & \quad r=6 \Rightarrow u=1+6=7 \end{aligned}$$

$$\Rightarrow \frac{3}{5} \int_2^7 u^{-2} du = \frac{3}{5} \left[ \frac{u^{-1}}{-1} \right]_2^7 = \frac{3}{5} \left[ -\frac{1}{7} - \left(-\frac{1}{2}\right) \right] = \frac{3}{5} \cdot \frac{5}{14} = \frac{3}{14}$$

$$= \frac{3}{5} \left[ \frac{(1+r)^{-1}}{-1} \right]_1^6 = \frac{3}{5} \left[ -(1+6)^{-1} - \left(- (1+1)^{-1}\right) \right] = \frac{3}{5} \left[ -\frac{1}{7} + \frac{1}{2} \right] = \frac{3}{5} \cdot \frac{5}{14} = \frac{3}{14}$$