#6 (#4, pg. 474)

$Y = X_1 + X_2 + \cdots + X_n$, X_i independent

where X_i is neg. binomial w/ parameters (r_i, p)

$$\therefore\ M_{X_i}(t) = \left[\frac{pe^t}{1-(1-p)e^t}\right]^{r_i} \quad \Big\}\ \text{Table 3}$$

$$\begin{aligned} M_Y(t) &= M_{X_1}(t)\cdot M_{X_2}(t)\cdots M_{X_n}(t) \\ &= \left[\frac{pe^t}{1-(1-p)e^t}\right]^{r_1}\left[\frac{pe^t}{1-(1-p)e^t}\right]^{r_2}\cdots\left[\frac{pe^t}{1-(1-p)e^t}\right]^{r_n} \\ &= \left[\frac{pe^t}{1-(1-p)e^t}\right]^{r_1+r_2+\cdots+r_n} \end{aligned}$$

$\therefore$ Y is neg. binomial w/ parameters p and $r = r_1 + r_2 + \cdots + r_n$.