EG-247

$$F(z) = \frac{1}{(1-0.5z^{-1})(1-0.75z^{-1})(1-z^{-1})}$$

$$= \frac{z^3}{(z-0.5)(z-0.75)(z-1)}$$

$$\frac{F(z)}{z} = \frac{z^2}{(z-0.5)(z-0.75)(z-1)}$$

$$= \frac{r_1}{z-0.5} + \frac{r_2}{z-0.75} + \frac{r_3}{z-1}$$

$$r_1 = \left.\frac{z^2}{(z-0.75)(z-1)}\right|_{z=0.5}$$

$$= \frac{0.5^2}{-0.25 \times -0.5} = 2$$

$$r_2 = \left.\frac{z^2}{(z-0.5)(z-1)}\right|_{z=0.75}$$

$$= \frac{(0.75)^2}{0.25 \times -0.75} = -9$$

$$r_3 = \left.\frac{z^2}{(z-0.5)(z-0.75)}\right|_{z=1} = \frac{1^2}{0.5 \cdot 0.25} = 8$$

$$\frac{F(z)}{z} = \frac{2}{z-0.5} - \frac{9}{z-0.75} + \frac{8}{z-1}$$

$$F(z) = \frac{2z}{z-0.5} - \frac{9z}{z-0.75} - \frac{8z}{z-1}$$

$$a^n \iff \frac{z}{z-a}$$

$$f[n] = 2(0.5)^n - 9(0.75)^n + 8$$

$$f[0] = 1$$

$$f[1] = 1/2 - 9 \times \frac{3}{4} + 8 = \frac{2}{4} - \frac{21}{4} + \frac{32}{4} = \frac{13}{4}$$

$$f[2] = 2(0.5)^2 - 9(0.75)^2 + 8 =$$
$$0.5 - 5.0625 + 8 = 3.4375$$

$$f[n] \to 8 \quad n \to \infty.$$