

$$2. G(z) = \frac{z}{5}(2 + 3z^2)$$

$$= \frac{2}{5}z + \frac{3}{5}z^3$$

$$\text{Hence } G'(z) = \frac{2}{5} + \frac{9}{5}z^2$$

$$G''(z) = \frac{18}{5}z$$

$$G'''(z) = \frac{18}{5}$$

$$\text{Since } P(X=k) = \frac{G^{(k)}(\cancel{0})}{k!}$$

$$P(X=0) = 0$$

$$P(X=1) = \frac{2}{5}$$

$$P(X=2) = 0$$

$$P(X=3) = \frac{3}{5}$$

$$P(X=k) = 0 \quad \forall k \geq 4$$