7. 3

$M = 90\,kNm$

$COV = .20$

$\sigma = COV \times M = 18$

$$f(x) = \phi\left(\frac{x_i - M}{\sigma}\right)$$

a) $Y(x_1, x_2) = x_1 \times x_2$ independent

for continuos normal distribute random variable

$$Y(x_1, x_2) = \int_{-\infty}^{x_1} f_1(x_1)\,dx_1 \int_{-\infty}^{x_2} f_2 x_2\,dx_2$$

$M = M_1 M_2$

$$M = \int x(f_1 x_1)\,dx_1 \int x f_2 x_2\,dx_2$$

$M_1 = 90\,kNm \quad M_2 = 90\,kNm$

$M = 8100\,kNm$

$\sigma = \sigma_1 \sigma_2$

$\sigma = 18 \times 18 = 164$

b) $P(f) = \Phi\left(x_1 - \sigma \right.$