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Group - 2

DAY: _____

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Class Reg: FA21-BCS-0321.

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$$\mu = 6$$

$$\sigma^2 = 12$$

a)

$$\mu = \alpha \cdot \beta$$

~~$$\sigma^2 = \alpha \cdot \beta^2$$~~

$$6 = \alpha \cdot \beta$$

$$\alpha = 6/\beta \quad -i$$

~~$$\sigma^2 = \alpha \cdot \beta^2$$~~

$$12 = \frac{6}{\beta} \cdot \beta^2$$

$$12 = 6 \cdot \beta$$

$$2 = \beta$$

Put in eq - i

~~$$\alpha = 6/2 = 3$$~~

$$\beta = 2, \alpha = 3$$

b) $P(x < 12)$

$$1 - P(x > 12)$$

formula

$$\frac{1}{\Gamma(\alpha) \beta^\alpha} x^{\alpha-1} e^{-x/\beta}$$

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$$\frac{1}{\Gamma(\alpha)} x^{\alpha-1} e^{-x/\beta}$$

$$\frac{1}{\Gamma(3)} x^2 e^{-x/2}$$

$$\frac{1}{\Gamma(3)} x^2 e^{-x/2}$$

$6 \times 2 \times 2$
 $\frac{1}{48}$

Applying integration

$$\frac{1}{48} \int x^2 e^{-x/2} dx$$

By parts.

$$\frac{1}{48} x^2 \int e^{-x/2} dx - \int \frac{dx^2}{dx} \cdot \int e^{-x/2} dx \int dx$$

$$\frac{1}{48} x^2 \frac{e^{-x/2}}{-1/2} - \int 2x \cdot \frac{e^{-x/2}}{-1/2} dx$$

$$\frac{1}{48} x^2 \frac{e^{-x/2}}{-1/2} - \int 2x \cdot 2e^{-x/2} dx$$

Again By parts

$$\frac{1}{48} x^2 \frac{e^{-x/2}}{-1/2} - 2 \int x \cdot e^{-x/2} dx$$

$$\frac{1}{48} x^2 \frac{e^{-x/2}}{-1/2} - 2 \left(x \int e^{-x/2} dx - \int \frac{dx}{dx} \int e^{-x/2} dx \right) dx$$

$$11 - 2 \left(x \frac{e^{-x/2}}{-1/2} - \int \frac{e^{-x/2}}{-1/2} dx \right)$$

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$$\frac{1}{-1/2} \left[x \cdot e^{-x/2} - 4e^{-x/2} \right]$$

$$11 + 4x e^{-x/2} + 4e^{-x/2}$$

$$\frac{1}{48} \left[-2x^2 \cdot e^{-x/2} + 4x e^{-x/2} + 4e^{-x/2} \right] \Big|_0^{12}$$

$$\frac{1}{48} \left[-2(12) e^{-12/2} + 4(12) e^{-12/2} + 4e^{-12/2} \right] -$$

$$\left[-0 + 0 + 4e^0 \right]$$

$$1 - \left(\frac{1}{48} [-0.059 + 0.1184 + 0.00491] \right)$$

$$1 - \left(\frac{0.06481}{48} \right)$$

$$1 - 0.00135$$

$$0.998$$

c)

blue 10 to 13.

$$\frac{1}{48} \left[-2x^2 \cdot e^{-x/2} + 4x e^{-x/2} + 4e^{-x/2} \right] \Big|_{10}^{13}$$

$$\frac{1}{48} \left[-2(13) \cdot e^{-13/2} + 4(13) e^{-13/2} + 4e^{-13/2} \right] -$$

$$\left[-2(10) \cdot e^{-10/2} + 4(10) e^{-10/2} + 4e^{-10/2} \right]$$