No.

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解：(a) 由式(1.16)

$$\int_{-\infty}^{+\infty} P(x)dx = \int_{-\infty}^{+\infty} A e^{-\lambda(x-a)^2} dx = 2A\int_0^{+\infty}(x-a)^{2\times0}\cdot e^{-\frac{(x-a)^2}{(1/\sqrt{\lambda})^2}} d(x-a)$$

$$= 2A\cdot\sqrt{\pi}\cdot\frac{(2\times0)!}{0!}\cdot\left(\frac{1}{2}\cdot\frac{1}{\sqrt{\lambda}}\right)^{2\times0+1} = A\sqrt{\frac{\pi}{\lambda}} = 1$$

故 $A=\sqrt{\frac{\lambda}{\pi}}$

(b) $\langle x\rangle = \int_{-\infty}^{+\infty} x P(x)dx = \int_{-\infty}^{+\infty} x\cdot\sqrt{\frac{\lambda}{\pi}} e^{-\lambda(x-a)^2}dx$

$$=2\sqrt{\frac{\lambda}{\pi}}\int_0^{+\infty} x^{2\times0+1} e^{-\frac{(x-a)^2}{(1/\sqrt{\lambda})^2}} d(x-a) = 2\sqrt{\frac{\lambda}{\pi}}\cdot\frac{0!}{2}\left(\frac{1}{\sqrt{\lambda}}\right)^{2\times0+2}$$

$$=\frac{1}{\sqrt{\lambda\pi}}$$

$$\langle x^2\rangle = \int_{-\infty}^{+\infty} x^2 P(x)dx = \int_{-\infty}^{+\infty} x^2\sqrt{\frac{\lambda}{\pi}} e^{-\lambda(x-a)^2}dx$$

$$=2\sqrt{\frac{\lambda}{\pi}}\int_0^{+\infty} x^{2\times1}\cdot e^{-\frac{(x-a)^2}{(1/\sqrt{\lambda})^2}} d(x-a) = 2\sqrt{\frac{\lambda}{\pi}}\cdot\sqrt{\pi}\cdot\frac{(2\times1)!}{1!}\left(\frac{1}{2}\cdot\frac{1}{\sqrt{\lambda}}\right)^{2\times1+1}$$

$$=\frac{1}{2\lambda}$$

$$\sigma^2 = \sqrt{\langle x^2\rangle-\langle x\rangle^2} = \sqrt{\frac{1}{2\lambda}-\left(\frac{1}{\sqrt{\lambda\pi}}\right)^2} = \sqrt{\frac{1}{\lambda}\left(\frac{1}{2}-\frac{1}{\pi}\right)}$$

(c) $P(x)=\sqrt{\frac{\lambda}{\pi}}e^{-\lambda(x-a)^2}$

$$\frac{dP(x)}{dx} = \sqrt{\frac{\lambda}{\pi}}\cdot e^{-\lambda(x-a)^2}\cdot[-2\lambda(x-a)] = -\frac{2\lambda\sqrt{\lambda}}{\sqrt{\pi}}e^{-\lambda(x-a)^2}\cdot(x-a)$$

令 $\frac{dP(x)}{dx}=0$ 得 $x=a$ 时取极值

$x>a$时，$\frac{dP(x)}{dx}<0$，单调减

$x<a$时，$\frac{dP(x)}{dx}>0$，单调增

故 $x=a$ 取最大值