$$\begin{aligned} &+ \left[ 1 + \theta |x - x'| + \frac{1}{3}\theta^{2}(x - x')^{2} \right] \exp\left\{ -\theta |x - x'| \right\} \left( -\theta sign(x - x') \right) \\ &= \exp\left\{ -\theta |x - x'| \right\} \left[ \theta sign(x - x') + \frac{2}{3}\theta^{2}(x - x') - \theta sign(x - x') - \theta^{2} |x - x'| sign(x - x') - \frac{1}{3}\theta^{3}(x - x')^{2} sign(x - x') \right] \\ &= \exp\left\{ -\theta |x - x'| \right\} \left[ -\frac{1}{3}\theta^{2}(x - x') - \frac{1}{3}\theta^{3}(x - x')^{2} sign(x - x') \right] \\ &= \exp\left\{ -\theta |x - x'| \right\} \left( -\frac{1}{3}\theta^{2}(x - x') \right) \left[ 1 + \theta(x - x') sign(x - x') \right] \\ &= -\frac{1}{3}\theta^{2}(x - x') \left[ 1 + \theta |x - x'| \right] \exp\left\{ -\theta |x - x'| \right\} \end{aligned}$$

$$\frac{\partial^2}{\partial x' \partial x} g(x, x') = \frac{\partial}{\partial x'} \left[ -\frac{1}{3} \theta^2 (x - x') \left[ 1 + \theta |x - x'| \right] \exp \left\{ -\theta |x - x'| \right\} \right]$$

$$= \frac{\partial}{\partial x'} \left[ \left[ -\frac{1}{3} \theta^2 (x - x') - \frac{1}{3} \theta^3 (x - x')^2 \operatorname{sign}(x - x') \right] \exp \left\{ -\theta |x - x'| \right\} \right]$$

$$= \frac{\partial}{\partial x'} \left[ \left[ -\frac{1}{3} \theta^2 (x - x') - \frac{1}{3} \theta^3 (x - x')^2 \operatorname{sign}(x - x') \right] \exp\left\{ -\theta |x - x'| \right\} \right]$$

$$= \left[ \frac{1}{3} \theta^2 - \frac{2}{3} \theta^3 (x - x') (-1) \operatorname{sign}(x - x') \right] \exp\left\{ -\theta |x - x'| \right\}$$

$$= \left[ \frac{1}{3} \theta^2 - \frac{2}{3} \theta^3 (x - x') (-1) sign(x - x') \right] \exp \left\{ -\theta |x - x'| \right\}$$

$$+ \left[ -\frac{1}{3} \theta^2 (x - x') - \frac{1}{3} \theta^3 (x - x')^2 sign(x - x') \right] \exp \left\{ -\theta |x - x'| \right\} (\theta sign(x - x'))$$

$$+ \left[ -\frac{1}{3}\theta^{2}(x-x') - \frac{1}{3}\theta^{3}(x-x')^{2} sign(x-x') \right] \exp\left\{ -\theta|x-x'| \right\} \left( \theta sign(x-x') \right)$$

$$= \exp\left\{ -\theta|x-x'| \right\} \left[ \frac{1}{2}\theta^{2} + \frac{2}{2}\theta^{3}|x-x'| - \frac{1}{2}\theta^{3}|x-x'| - \frac{1}{2}\theta^{4}(x-x')^{2} \right]$$

$$= \exp\left\{-\theta|x-x|\right\} \left[ \frac{1}{3}\theta^2 + \frac{2}{3}\theta^3|x-x| - \frac{1}{3}\theta^3|x-x| - \frac{1}{3}\theta^4(x-x')^2 \right]$$

 $= \exp\left\{-\theta|x-x|\right\} \left[ \frac{1}{3}\theta^2 + \frac{1}{3}\theta^3|x-x| - \frac{1}{3}\theta^4(x-x')^2 \right]$ 

 $= \frac{1}{3}\theta^{2} \left[ 1 + \theta |x - x'| - \theta^{2} (x - x')^{2} \right] \exp \left\{ -\theta |x - x'| \right\}$ 

 $g(x,x') = \left| 1 + \theta |x - x'| + \frac{1}{3}\theta^2 |x - x'|^2 \right| \exp \left\{ -\theta |x - x'| \right\}$ 

 $\frac{\partial}{\partial x}g(x,x') = \left[\theta sign(x-x') + \frac{2}{3}\theta^2(x-x') \left| \exp\{-\theta|x-x'|\}\right| \right]$