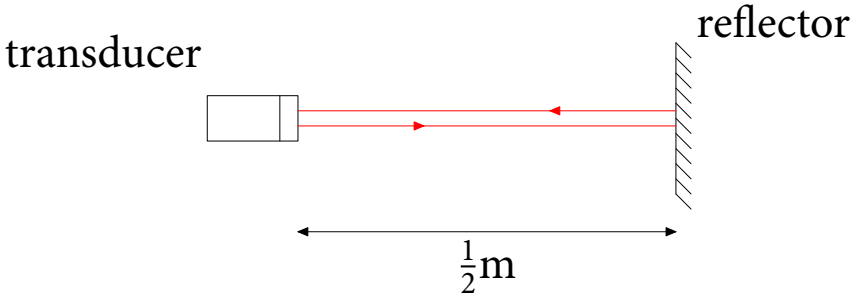


(a) f

$$\tau(x) = \frac{\tau^+ + \tau^-}{2} \quad (1)$$

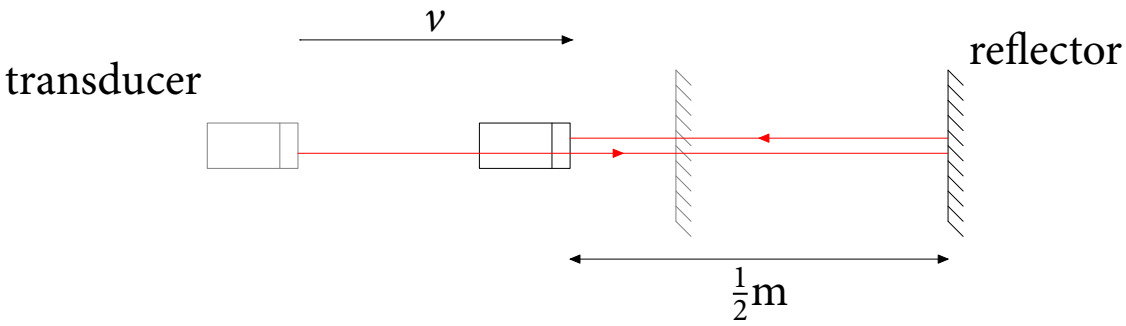
$$\rho(x) = \frac{\tau^+ - \tau^-}{2} \quad (2)$$

$$c \times \tau(x) = 52.44cm \quad (3)$$

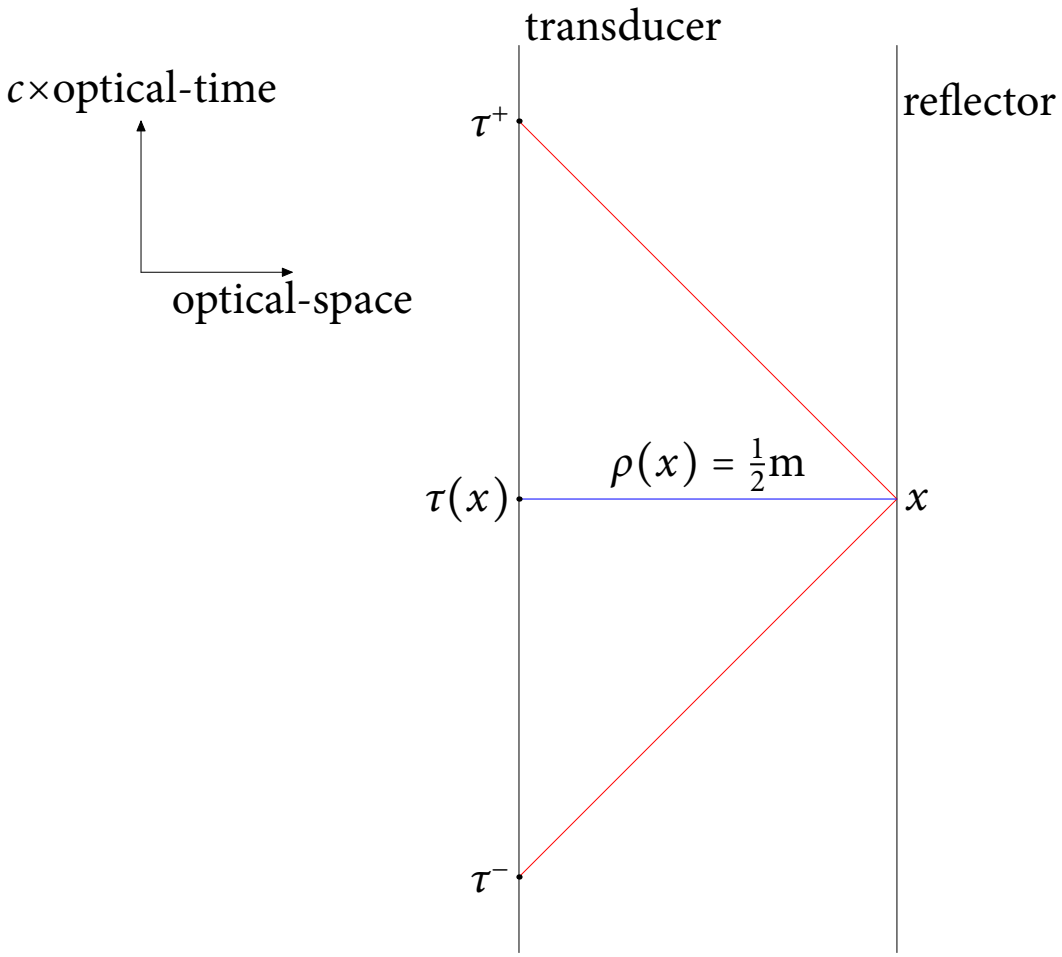
$$c \times k^2 \times \tau(x) = 55.56cm \quad (4)$$

$$(5)$$

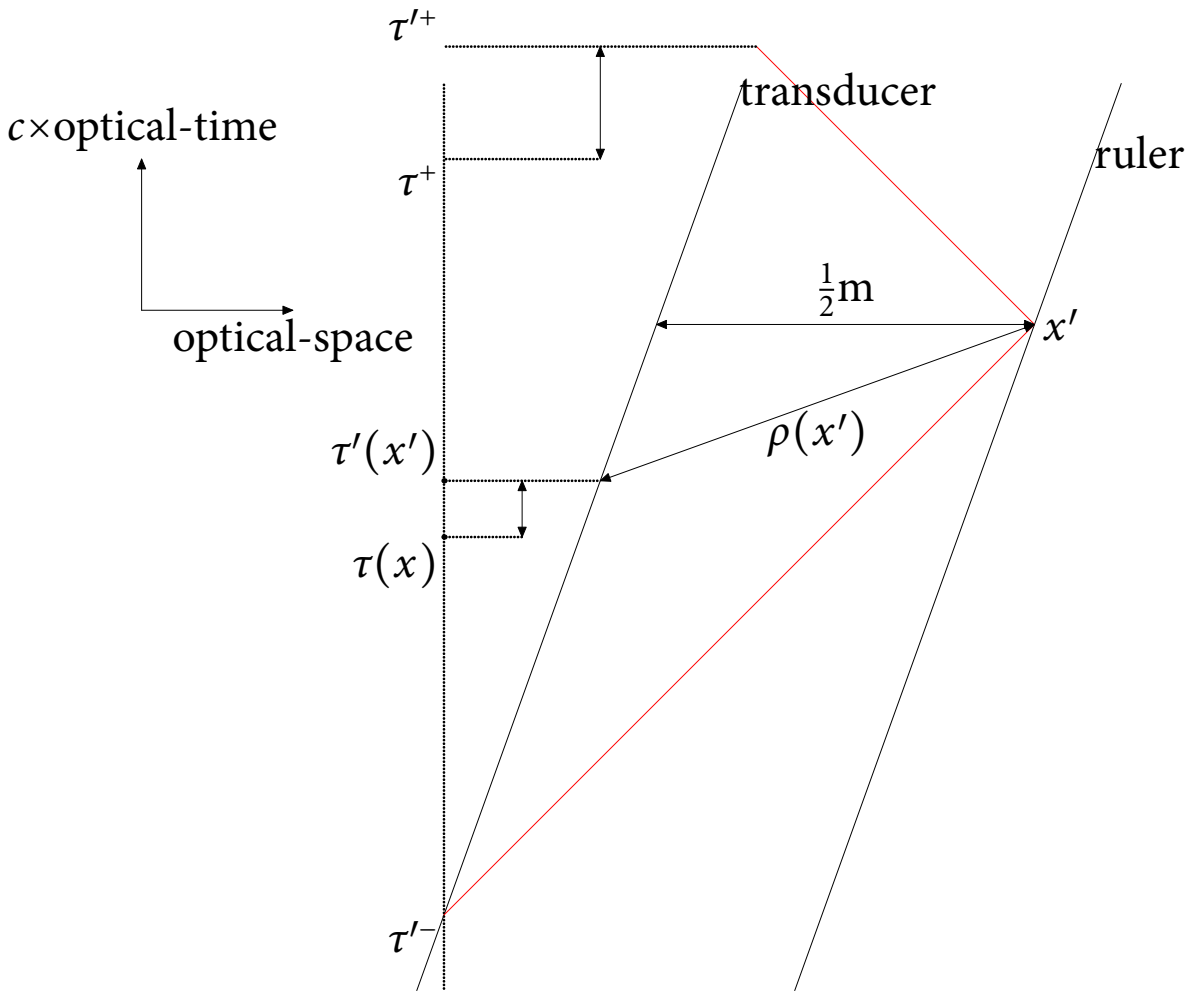
$$c \times k \times \tau(x) = 53.98cm \quad (6)$$



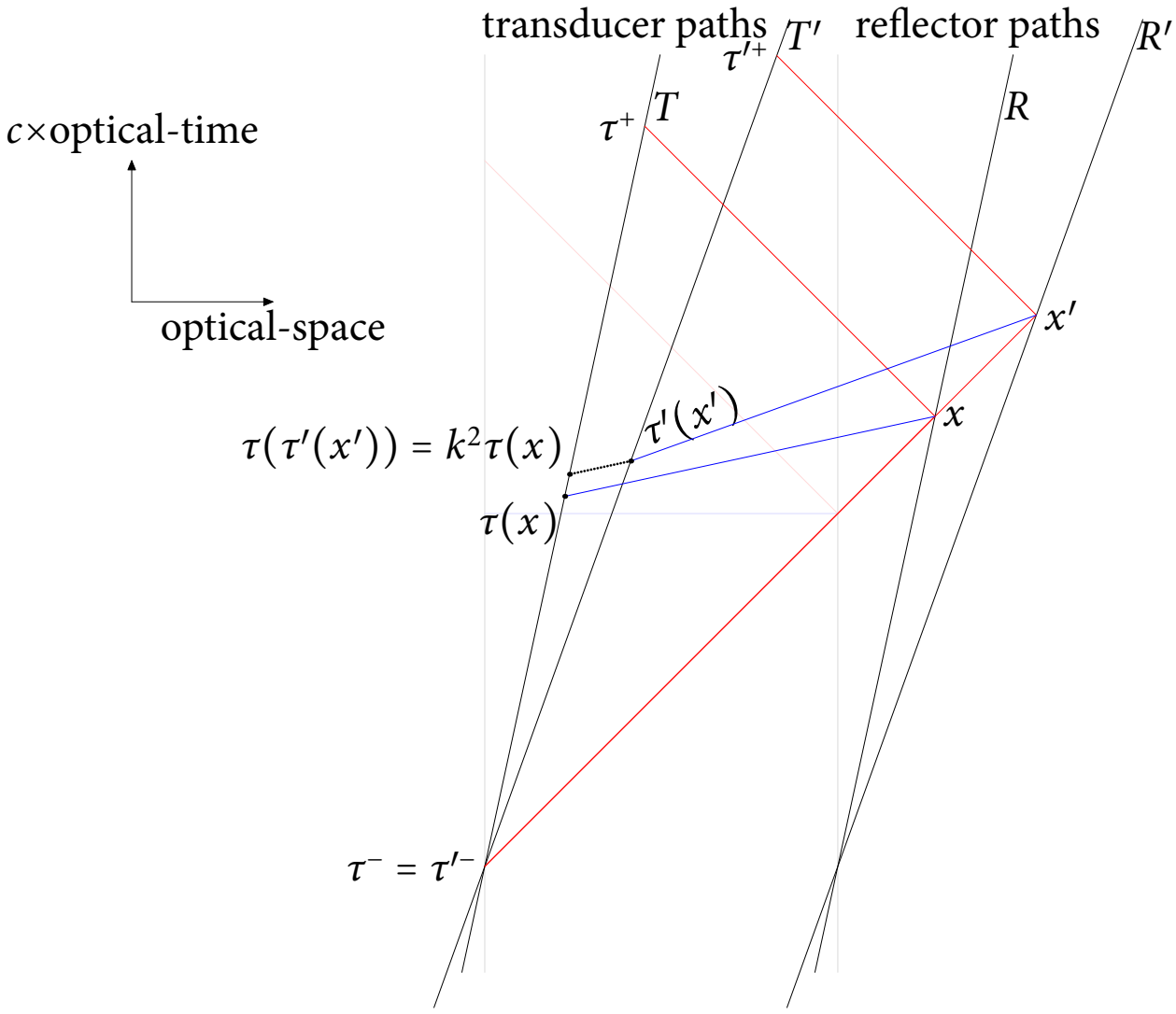
(b) f


transducer
$c\times$optical-time
reflector
τ^+
optical-space
$\rho(x) = \frac{1}{2}\mathrm{m}$
$\tau(x)$
x
τ^-

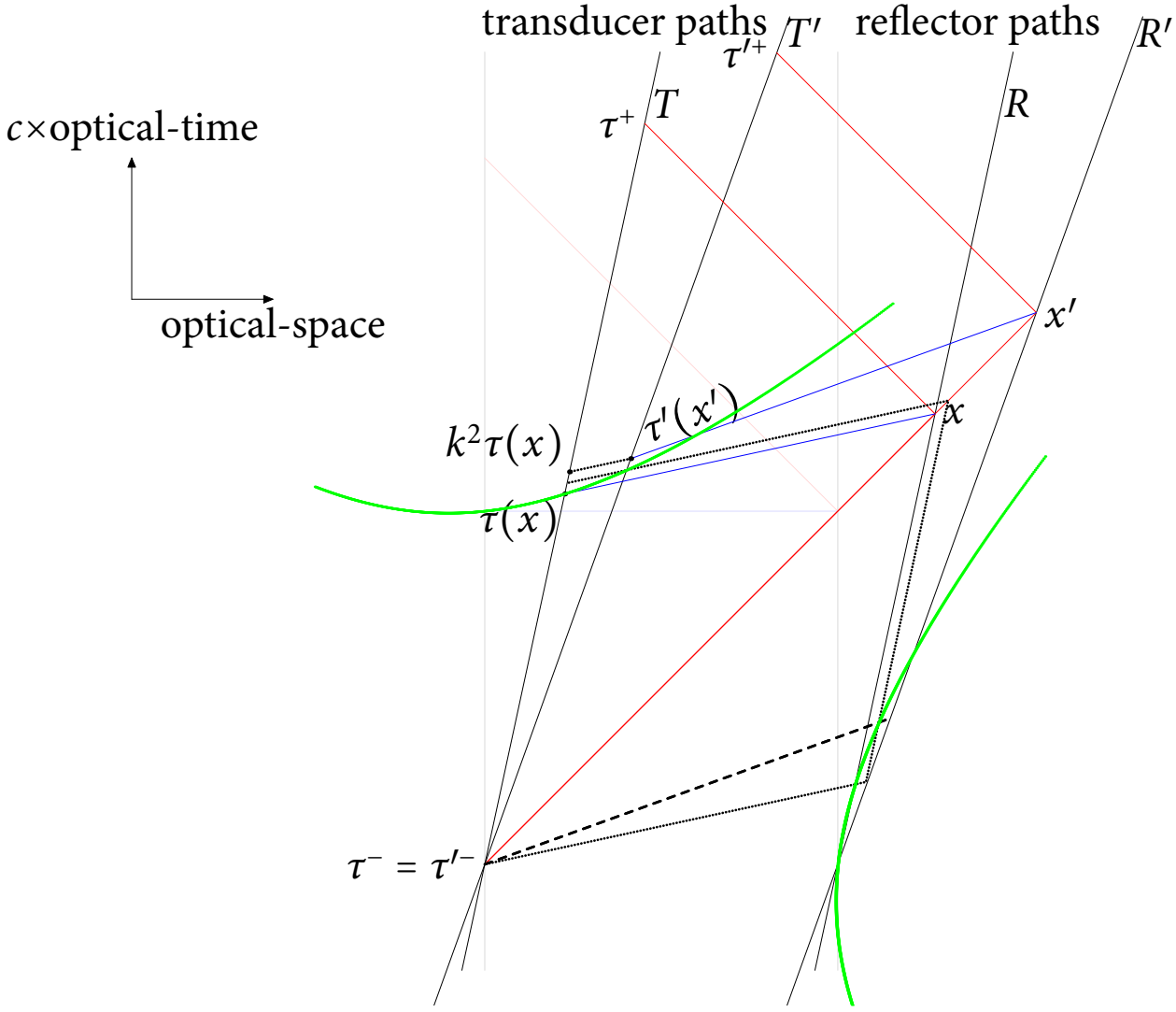
(c) f


τ'^{+}
transducer
$c\times$optical-time
ruler
τ^{+}
$\frac{1}{2}$m
optical-space
x'
$\rho(x')$
$\tau'(x')$
$\tau(x)$
τ'^{-}

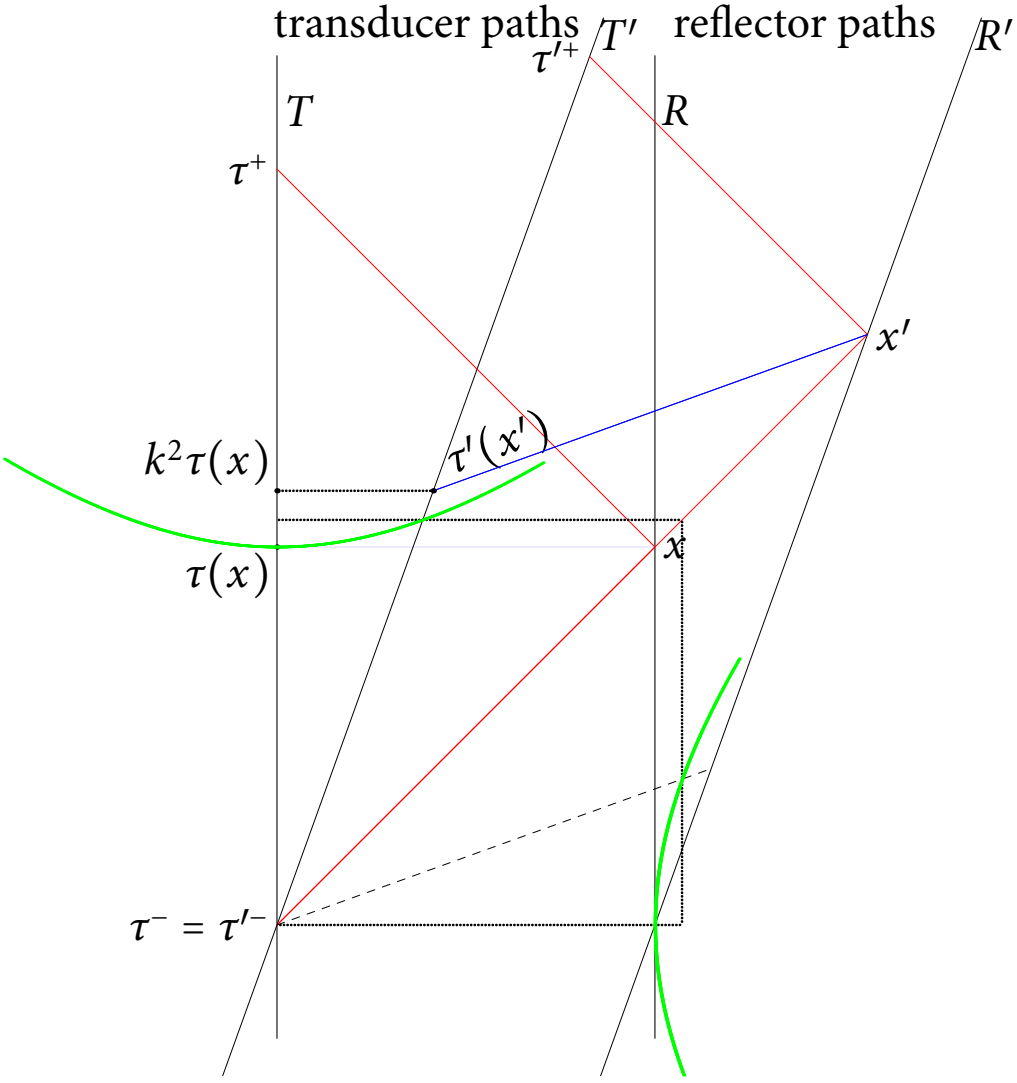
(d) f


transducer paths
T'
reflector paths
R'
τ'^{+}
T
R
τ^{+}
$c\times$optical-time
optical-space
x'
$\tau'(x')$
x
$\tau(\tau'(x')) = k^2\tau(x)$
$\tau(x)$
$\tau^{-} = \tau'^{-}$

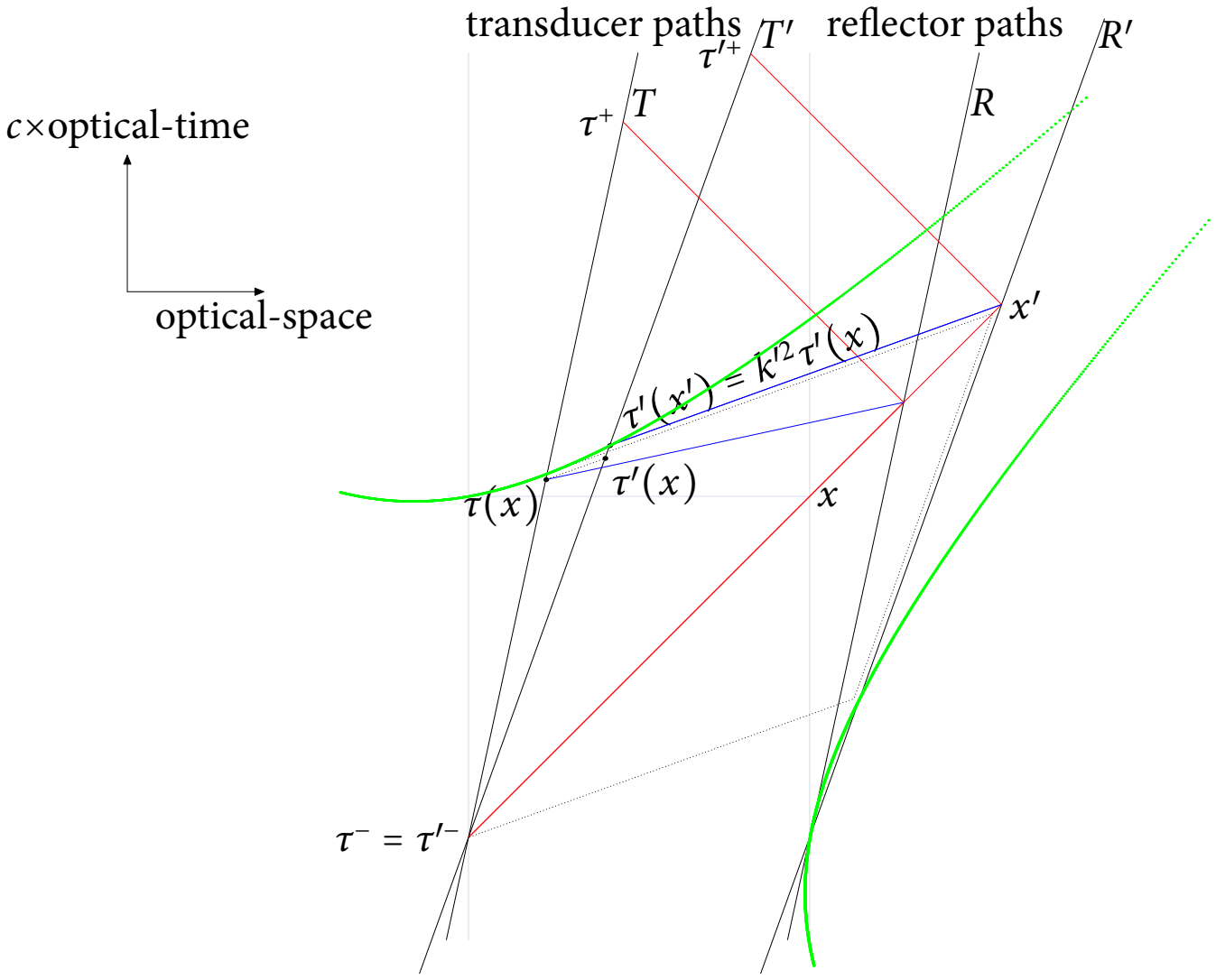
(e) f


transducer paths
T'
reflector paths
R'
τ'^{+}
τ^{+}
T
R
$c\times$optical-time
optical-space
x'
$k^2\tau(x)$
$\tau'(x')$
x
$\tau(x)$
$\tau^{-} = \tau'^{-}$

(f) f


transducer paths
T'
reflector paths
R'
τ'^{+}
T
R
τ^{+}
x'
$k^2\tau(x)$
$\tau'(x')$
x
$\tau(x)$
$\tau^{-} = \tau'^{-}$

(g) f


transducer paths
T'
reflector paths
R'
τ'^{+}
$c\times$optical-time
τ^{+}
T
R
optical-space
x'
$\tau'(x') = k'^{2}\tau'(x)$
$\tau'(x)$
$\tau(x)$
x
$\tau^{-} = \tau'^{-}$

(h) f