(19) $(\ln(t^2+1), t^3)$ $t=1$ speed

$\frac{dx}{dt} = \frac{2t}{t^2+1}$ $\frac{dy}{dt} = 3t^2$

$x' = 1$ $y' = 3$

$\sqrt{1^2+3^2} = \sqrt{10}$

(11) $(\sin\theta - \theta\cos\theta,\ \cos\theta + \theta\sin\theta)$

$0 \le \theta \le 2$

$$\frac{dx}{dt} = \cos t - (\cos t - t\sin t) = t\sin t$$

$$\frac{dy}{dt} = -\sin t + (\sin t + t\cos t) = t\cos t$$

$$\sqrt{t^2\sin^2 t + t^2\cos^2 t} = t$$

$$\int_0^2 t\,dt = \frac{1}{2}t^2\Big|_0^2 = 2$$