

解:

$$(1) \ x = 0 \text{ 时: } 2 - t - t^2 = 0$$

$$(2 + t)(1 - t) = 0$$

又 $t \neq 0$, 故 $t = -2$

$$\text{此时 } y = 2 - 3 \times (-2) + (-2)^2 = 12$$

$$y = 0 \text{ 时: } 2 - 3t + t^2$$

$$(t - 1)(t - 2) = 0$$

$$\text{则 } t = 2, \text{ 此时 } x = 2 - 2 - 2^2 = -4$$

$$\text{故 } |AB| = \sqrt{4^2 + 12^2} = 4\sqrt{10}$$

$$(2) \text{ 由 (1) 得: } AB: y = 3x + 12$$

将: $y = \rho \sin \theta, x = \rho \cos \theta$ 代入,

得: $\rho \sin \theta - 3\rho \cos \theta - 12 = 0$, 即为 AB 极坐标方程