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①

$$J(x,y) = \sqrt{x^2 - 2y}$$

$$a) \sqrt{x^2 - 2y} \geq 0$$

$$x^2 - 2y \geq 0$$

$$x^2 \geq 2y$$

$$\text{Dom } J(x,y) = \left\{ x, y \in \mathbb{R}^2 / x^2 \geq 2y \right\}$$

$$b) J(x,y) = \sqrt{x^2 - 2y}$$

$$J(x,y) \geq 0$$

$$\text{Im } J(x,y) \geq 0$$

$$\text{Im } J = \mathbb{R}^+$$

$$c) P = \left( 2, -\frac{5}{2} \right)$$
  
$$J(x,y) = \sqrt{x^2 - 2y}$$
  
$$c = \sqrt{x^2 - 2y}$$
  
$$\begin{aligned} c^2 &= x^2 - 2y \\ c^2 &= (2)^2 - 2\left(-\frac{5}{2}\right) \\ c^2 &= 4 + 5 \\ c &= 3 \end{aligned}$$
  
$$\sqrt{x^2 - 2y} = 3$$

$$d) y = \frac{x^2 - 9}{2}$$

$$y' = \frac{dy}{dx} \left( \frac{x^2 - 9}{2} \right)$$

$$y' = \frac{2x}{2} \Rightarrow y' = x$$

$$\vec{V}_{tg} = \begin{bmatrix} x & \frac{x^2 - 9}{2} \end{bmatrix}^t$$

$$\vec{V}_{tg}^{-1} = \begin{bmatrix} 1 & x \end{bmatrix}^t$$

$$\vec{V}_{tg}^{-1} = \begin{bmatrix} 1 & z \end{bmatrix}^t$$

$$y - y_0 = y'(x - x_0)$$

$$y + \frac{5}{2} = 2(x - 2)$$

$$y + \frac{5}{2} = 2x - 4$$

$$y = 2x - 4 + \frac{5}{2}$$

$$y = 2x - \frac{8}{2} + \frac{5}{2}$$

$$y = 2x - \frac{13}{2}$$