

10.1 | 연습문제 정답

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01. $y = t, x = 2t^2 \ (-3 \leq t \leq 0)$ 또는 $x = t, y = -\sqrt{\frac{t}{2}} \ (0 \leq t \leq 18)$

02. $x = \cos^3 t, y = \sin^3 t \ (0 \leq t \leq 2\pi)$

03. $x = e^t + e^{-t}, y = e^t - e^{-t}$

04. $x = \sin t, y = \cos t \ (0 \leq t \leq \pi)$

05. $x = 2 + \cos t, y = 3 + 2\sin t \ (0 \leq t \leq 2\pi)$

06. 시작점 (1, 3), 끝점 (4, 21)인 $y = x^2 + x + 1$

07. $x^2 - (y - 1)^2 = -1$

08. $x^2 - y^2 = 4$

09. (a) $y = -x$ (b) $y = 2ex + e$

10. 수평접선이 되는 점은 $t = \frac{\pi}{2}$ 일 때 (0, 3),

수직접선이 되는 점은 $t = 0, t = \pi$ 일 때 (2, 0), (-2, 0)

11. $\frac{dy}{dx} \Big|_{t=\frac{\pi}{6}} = -\frac{4\sqrt{3}}{5}, \frac{d^2y}{dx^2} \Big|_{t=\frac{\pi}{6}} = -\frac{32}{25}$

12. $\frac{dy}{dx} = \frac{-\sin t}{2e^{2t}}, \quad \frac{d^2y}{dx^2} = \frac{2\sin t - \cos t}{(2e^{2t})^2}$

13. $\frac{dy}{dx} = \frac{2t}{e^{t-1}}, \quad \frac{d^2y}{dx^2} = \frac{2(1-t)}{(e^{t-1})^2}, \quad y = 2x$

14. $\frac{dy}{dx} = \frac{\cos\theta + \cos^2\theta - \sin^2\theta}{-\sin\theta - 2\cos\theta\sin\theta},$
 $\frac{d^2y}{dx^2} = \frac{(-\sin\theta - 2\sin 2\theta)}{(\sin\theta + \sin 2\theta)^2} - \frac{(\cos\theta + \cos 2\theta)(\cos\theta + 2\cos 2\theta)}{(\sin\theta + \sin 2\theta)^3}, \quad y = \frac{3\sqrt{3}}{4}$

15. $\frac{2^{11}}{35}$