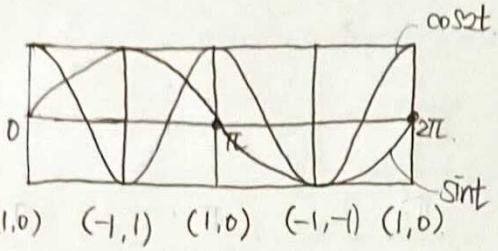
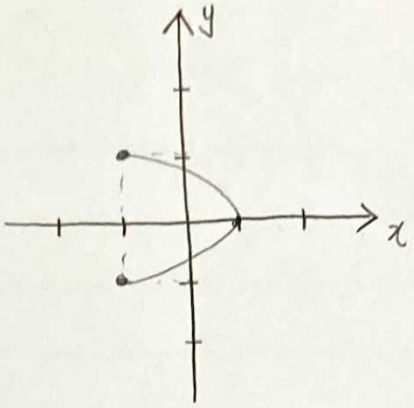
공학수학 2 HW1

20200323306 송민정

1. $C: r(t) = (\cos 2t, \sin t, 0)$, $0 \le t \le 2\pi$

$x = \cos 2t$, $y = \sin t$, $z = 0$





$r'(t) = (-2\sin 2t, \cos t, 0)$ 에서,

$r'(0) = (0, 1, 0)$, $r'(\frac{\pi}{6}) = (-\sqrt{3}, \frac{\sqrt{3}}{2}, 0)$

2. $C: r(t) = (t^2, t^2 - t, -7t)$, $0 \le t \le 10$

$t = 3$ 일 때, $r(3) = (9, 6, -21)$

$r'(t) = (2t, 2t-1, -7)$ 에서, $r'(3) = (6, 5, -7)$

점 P에서 곡선 C의 접선은 $g(w) = r + wr'$ 이므로

$g(w) = r(3) + wr'(3)$

$= (9, 6, -21) + w(6, 5, -7) = (9+6w, 6+5w, -7(3+w))$ 이다.

3. $y = 2x^2 + 7x - 4$, $(x = -4, \frac{1}{2})$

포물선의 길이는 $\int_a^b \sqrt{1 + [f'(x)]^2}\, dx$

$= \int_{-4}^{\frac{1}{2}} \sqrt{1 + (4x+7)^2}\, dx = \int_{-4}^{\frac{1}{2}} \sqrt{16x^2 + 56x + 50}\, dx$

≈ 21.098 이다.