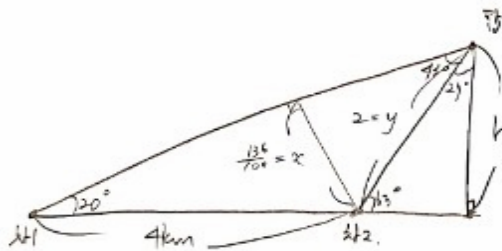




[문제 2-1]



탑과 도로 사이의 수직거리를 h 나 라자.

시속 60km인 차는 1분에 1km를 이동한다.

따라서 4분동안 차가 이동한 거리는 4km이다.

$$4 \sin 20^\circ = x$$

$$= 4 \cdot \frac{34}{100} = \frac{13.6}{100}$$

$$y \sin 43^\circ = \frac{13.6}{100}$$

$$y = \frac{13.6}{100} \times \frac{100}{88} = 2$$

$$y \cos 27^\circ = h$$

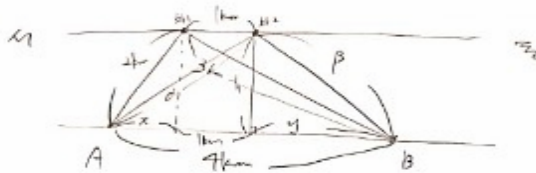
$$= 2 \times 0.89$$

$$= 1.78$$

$$\therefore h = 1.78 \text{ km.}$$



[문제 2-2]



시속 60km인 차는 18개
1km를 이동한 뒤
따라서 1분동안 차가 이동한 거리는 1km

$$x+y=3, \quad y=3-x$$

$$4 - x^2 = 9 - (1+y)^2$$

$$4-x^2 \quad 9-(4-x)^2$$

$$4 - x^2 = 9 - (x^2 - 8x + 16)$$

$$876 = 11$$

$$x = \frac{11}{8}, y = \frac{13}{8}$$

$$h^2 = 4 - x^2 = 4 - \frac{121}{64} = \frac{135}{64}$$

$$d^2 = b^2 + \left(\frac{19}{8}\right)^2$$

$$\beta^2 = h^2 + \left(\frac{13}{8}\right)^2$$

$$\alpha^2 + \beta^2 = 2h^2 + \frac{361}{64} + \frac{169}{64}$$

$$= \frac{290}{64} + \frac{63}{64} = \frac{800}{64} = \frac{100}{8} = \frac{25}{2}$$



[문제 2-3]

$$f(n) = an^2 + bn + c \quad (a \neq 0) \therefore f(n) \text{은 } n \text{의 2차 함수} \rightarrow \{a_k\}_{k=1}^{\infty}, \sum_{k=1}^n \frac{a_k}{k+2} = (n^2 - n)(n^2 + 3n + 2) = n(n-1)(n+1)(n+2)$$

$$\textcircled{1} n=1, \frac{4a_1}{3} = 0 \therefore a_1 = 0$$

$$\textcircled{2} n=2, \frac{4a_1}{3} + \frac{4a_2}{4} = 2 \cdot 1 \cdot 3 \cdot 4, \therefore a_2 = 24$$

$$\textcircled{3} n=3, \frac{4a_1}{3} + \frac{4a_2}{4} + \frac{4a_3}{5} = 3 \cdot 2 \cdot 4 \cdot 5$$

$$a_2 + \frac{4a_3}{5} = 120$$

$$\frac{4}{5}a_3 = 96$$

$$\therefore a_3 = 120$$

$$\textcircled{4} n=4, \frac{4a_1}{3} + \frac{4a_2}{4} + \frac{4a_3}{5} + \frac{4a_4}{6} = 4 \cdot 3 \cdot 5 \cdot 6$$

$$120 + \frac{4}{3}a_4 = 360$$

$$\therefore a_4 = 360$$

$n=2,$

$$\textcircled{1} f(2) = \sum_{k=2}^2 \left(\frac{a_k}{k-1} - k^2(k+3) \right)$$

$$= a_2 - 20 = 24 - 20$$

$$= 4$$

$$\textcircled{2} f(3) = \sum_{k=2}^3 \left(\frac{a_k}{k-1} - k^2(k+3) \right)$$

$$= 4 + \frac{a_3}{2} - 54$$

$$= 10$$

$$\textcircled{1} f(4) = 10 + \frac{a_4}{3} - 112$$

$$= \frac{a_4}{3} - 102 = 18$$

$f(n) = an^2 + bn + c$ 가 알맞은 2차 함수

$$f(2) = 4a + 2b + c = 4 \quad \dots (1)$$

$$f(3) = 9a + 3b + c = 10 \quad \dots (2)$$

$$f(4) = 16a + 4b + c = 18 \quad \dots (3)$$

(1)과 (2) 연립

$$5a + b = 6 \quad \dots (4)$$

(2)와 (3) 연립

$$12a + 2b = 14$$

$$6a + b = 7 \quad \dots (5)$$

(4), (5) 연립

$$a=1, b=1 \text{ 은 (1)에 대응. } c=-2$$

$$\therefore f(n) = n^2 + n - 2$$

$$\lim_{n \rightarrow \infty} \frac{n^2 + n - 2}{n+2} = \infty$$