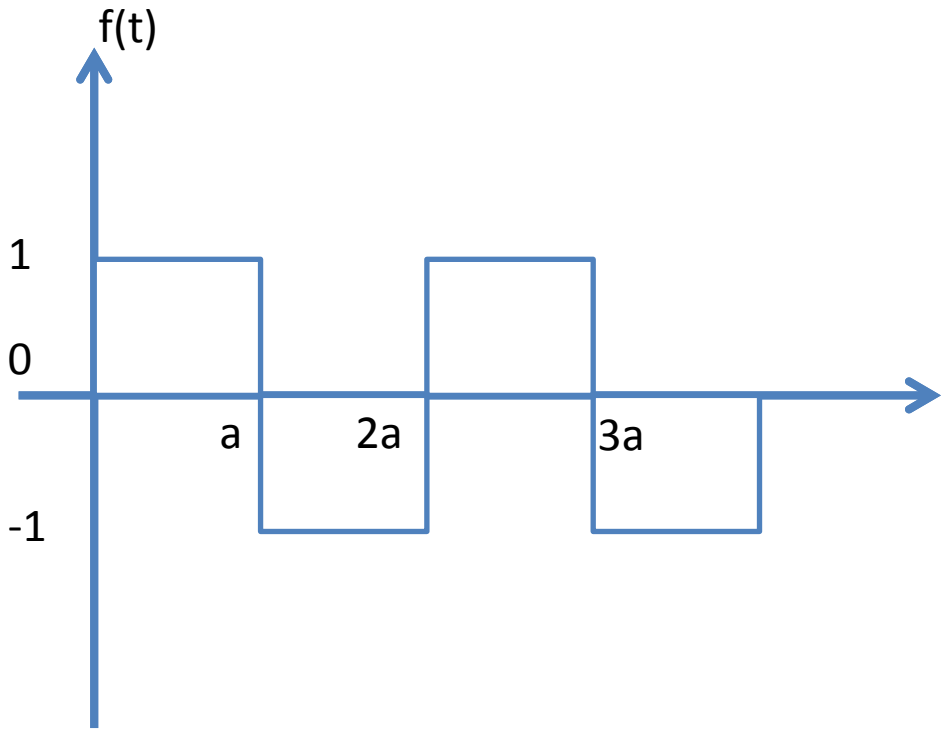
Direct formula (K.M. formula)

- It is function of various gate function

$$f(t) = \sum_{T=0}^{\infty} (A_f - A_i) U(t - T)$$

- A_f= Final value
- A_i= initial value



Using Gate function Formula

$f(t) = G_{0,a}(t) + (-1)\, G_{a,2a}(t) + G_{2a,3a}(t) + (-1)\, G_{3a,4a}(t) + \ldots\ldots\ldots$

$f(t) = 1.[U(t)-U(t-a)] + (-1).[U(t-a)-U(t-2a)] + 1.[U(t-2a)-U(t-3a)] + (-1).[U(t-3a)-U(t-4a)]$

$+\ldots\ldots\ldots$

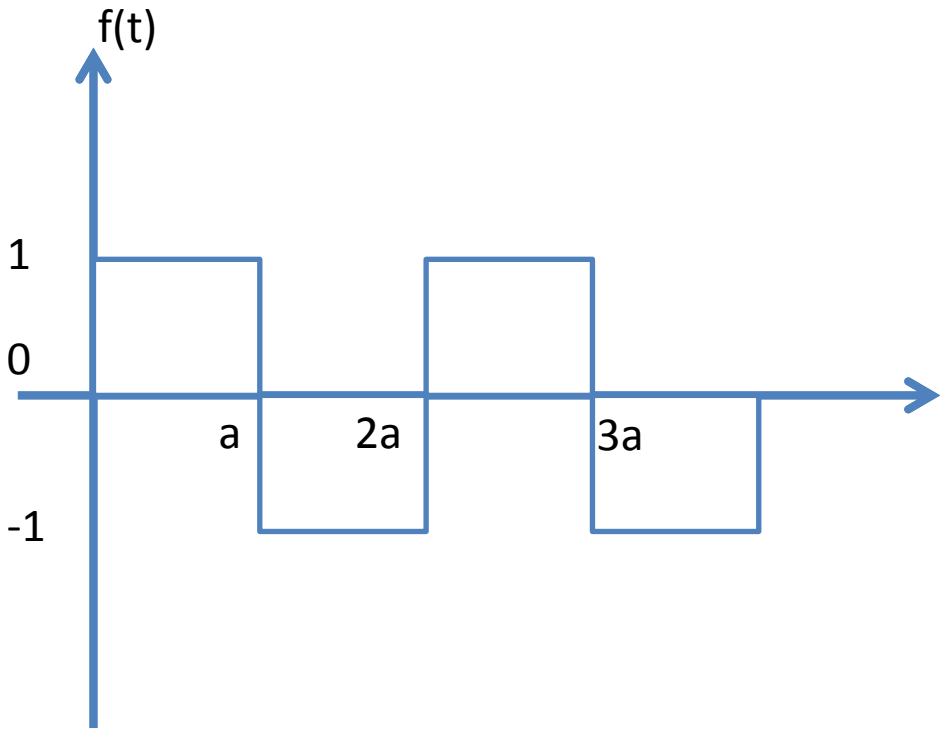
$f(t) = U(t) - 2\,U(t-a) + 2U(t-2a) - 2U(t-3a) + \ldots\ldots\ldots$

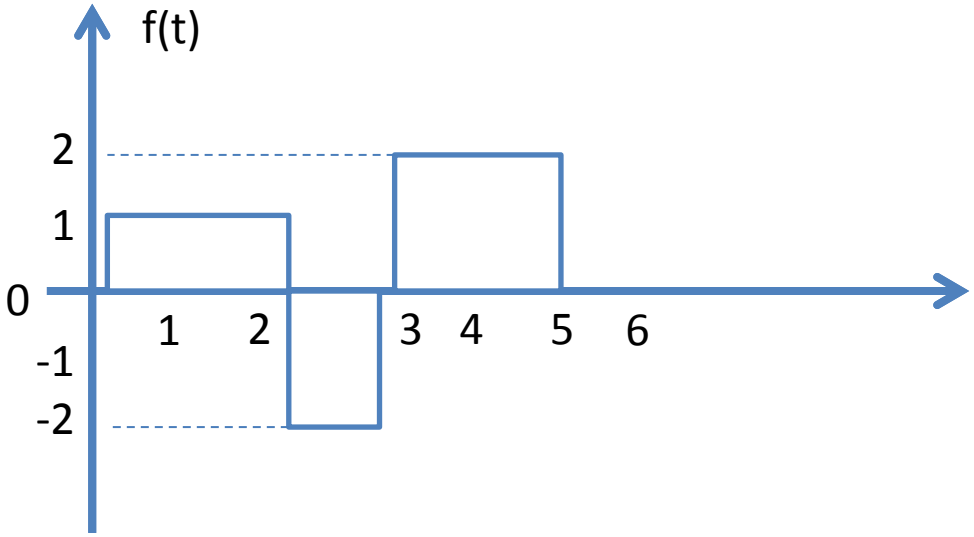
Using K.M. Formula

$$f(t) = \sum_{T=0}^{\infty} \left(A_f - A_i\right) U(t-T)$$

f(t)= (1-0) U(t-0)+ (-1-1) U(t-a)+ (1-(-1)) U(t—2a)+ (-1-1) U(t-3a)+……

f(t)= U(t)-2 U(t-a)+ 2U(t-2a)-2U(t-3a) + ……

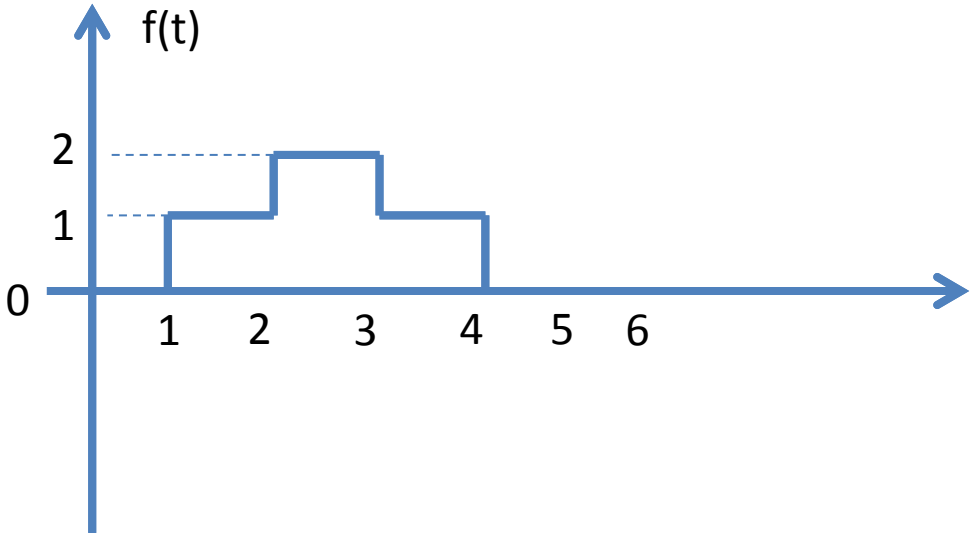




$f(t)= G_{0,2}(t)+(-2)\,G_{2,3}(t)+2G_{3,4}(t)$

$f(t) =1.[U(t)-U(t-2)]+(-2).[U(t-2)-U(t-3)]+2.[U(t-3)-U(t-5)]$

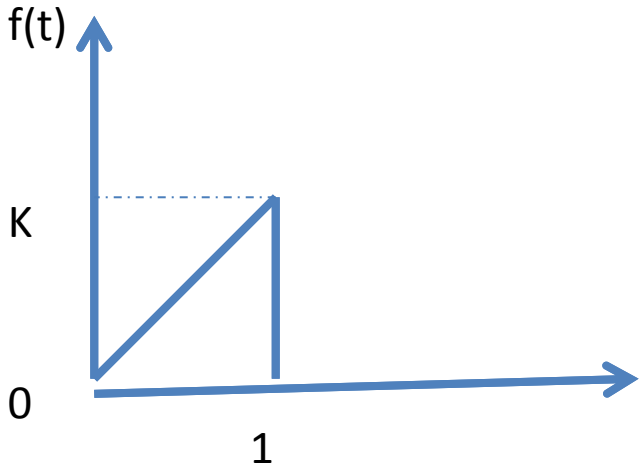
$f(t) = U(t)-3\,U(t-2)+4U(t-3)-2\,U(t-5)$



$f(t)= G_{1,2}(t)+2\,G_{2,3}(t)+G_{3,4}(t)$

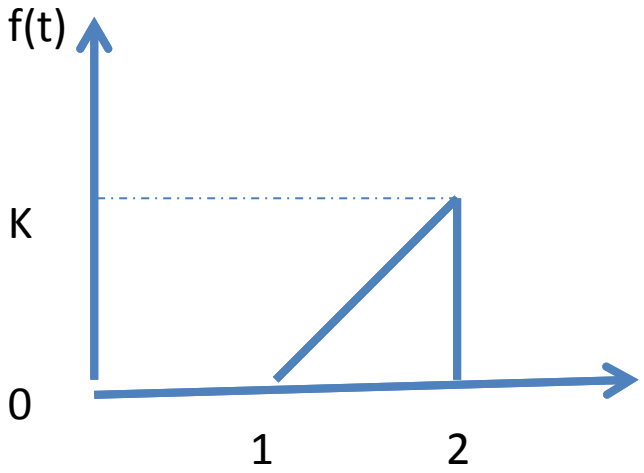
$f(t) =1.[U(t-1)-U(t-2)]+ 2.[U(t-2)-U(t-3)]+ [U(t-3)-U(t-4)]$

$f(t) = U(t-1)+ U(t-2)-U(t-3)-U(t-4)$

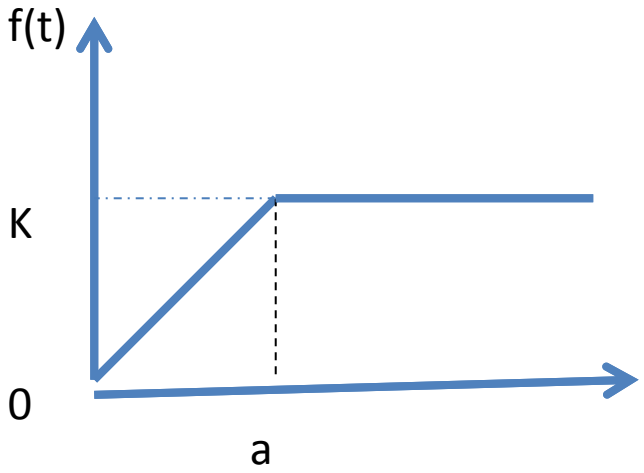


f(t) =Kt.[U(t)-U(t-1)]

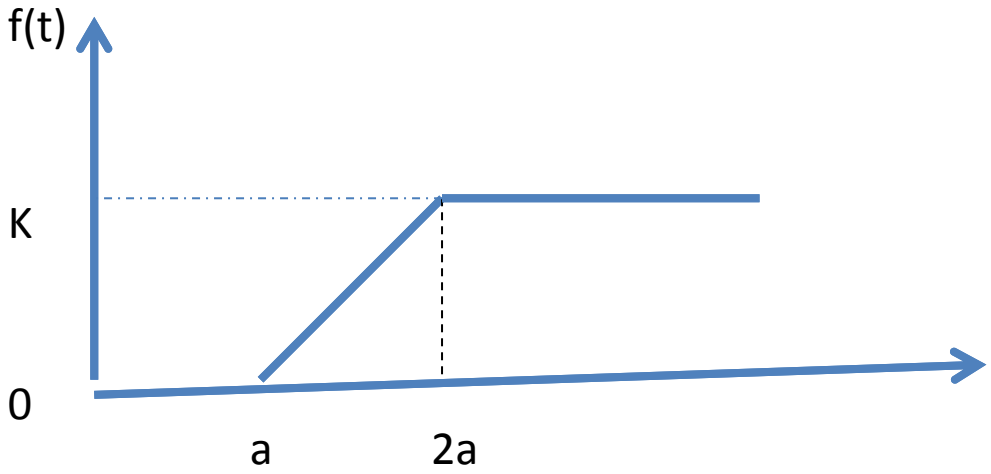
$$\frac{y_2 - y_1}{x_2 - x_1} = \frac{f(t) - y_1}{t - x_1}$$



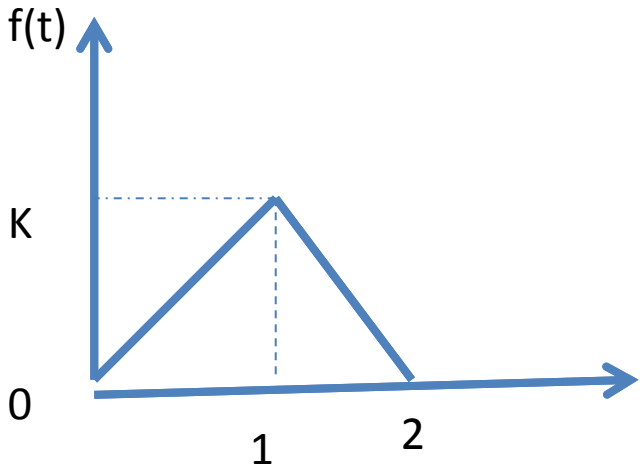
$$f(t) = K(t-1).[U(t-1)-U(t-2)]$$



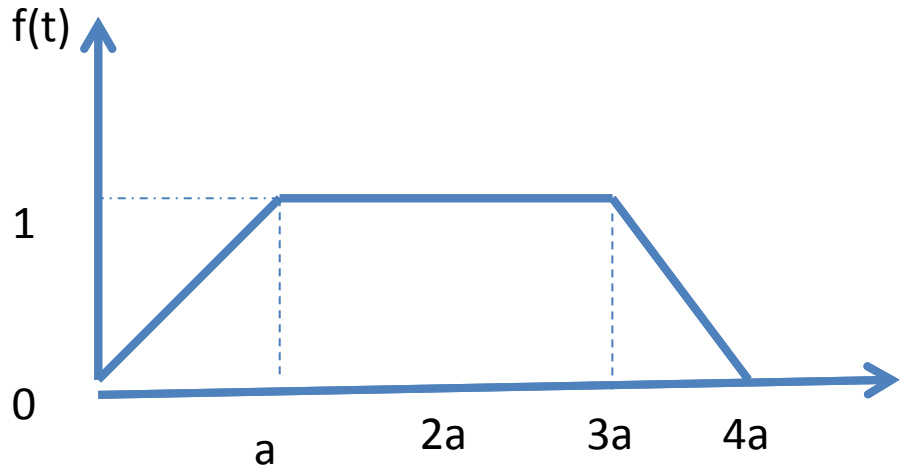
$$f(t) = K/a\ t.[U(t)-U(t-a)]+ K\ U(t-a)$$



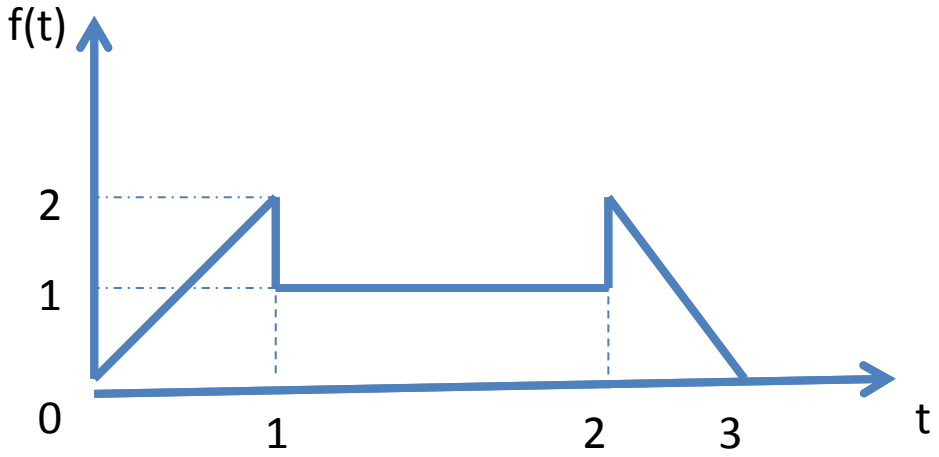
$$f(t) = K/a\ (t-a).[U(t-a)-U(t-2a)]+ K\ U(t-2a)$$



$$f(t)=Kt.[U(t)-U(t-1)]-K(t-2).[U(t-1)-U(t-2)]$$

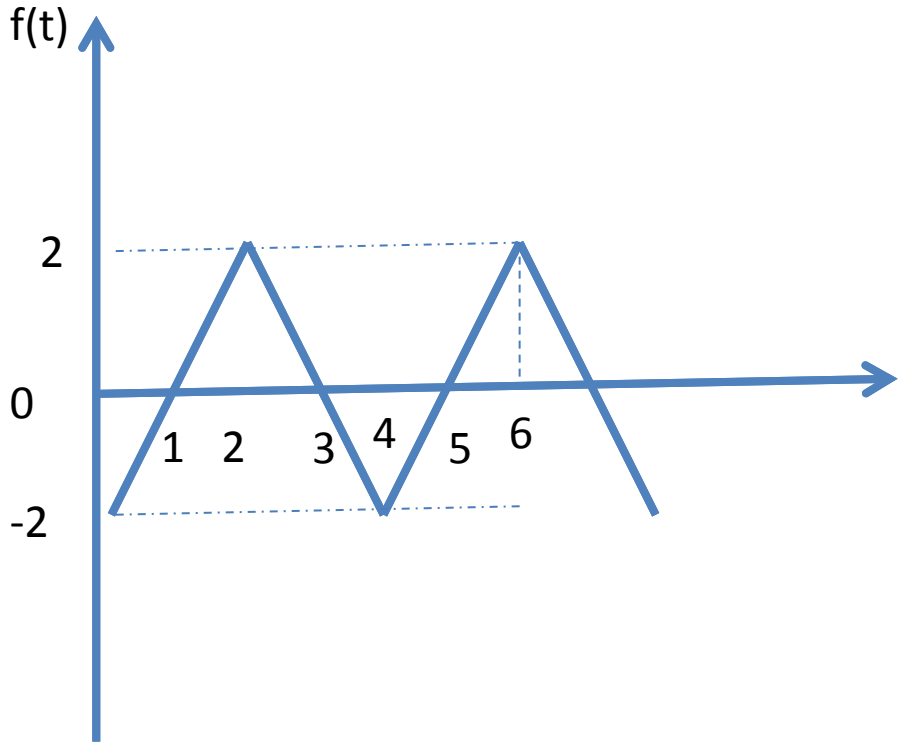


$$f(t)=1/a\ t.[U(t)-U(t-a)]+[U(t-a)-U(t-3a)]+[(-1/a)t+4][U(t-3a)-U(t-4a)]$$

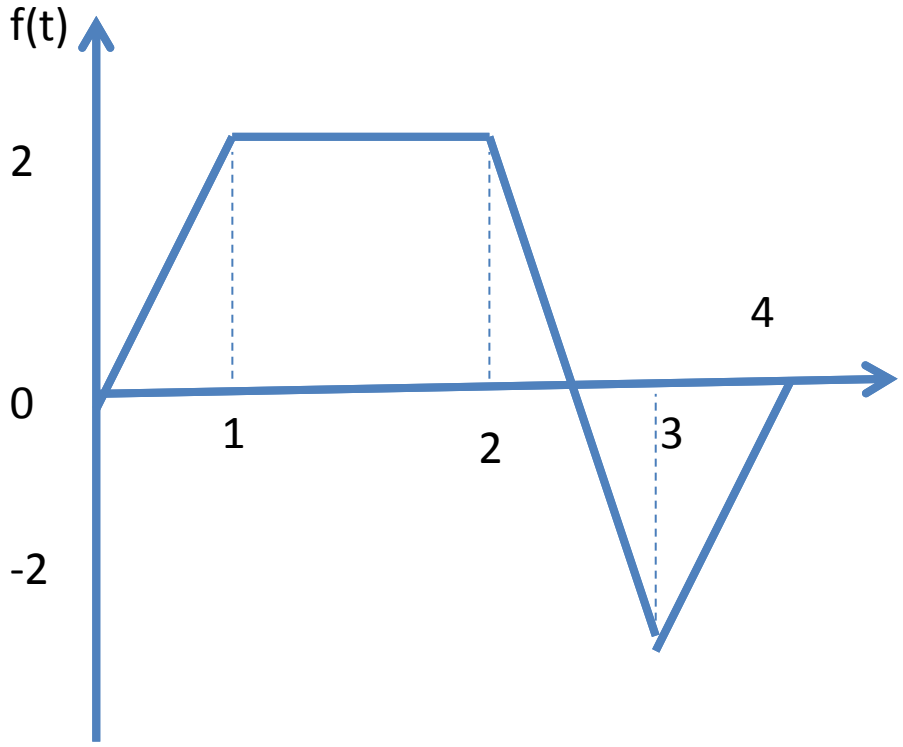


$f(t)= 2t\, G_{0,1}(t) + G_{1,2}(t) + (-2t+6) G_{2,3}(t)$

$= 2t.[U(t)-U(t-1)]+[U(t-1)-U(t-2)]+[-2t+6][U(t-2)-U(t-3)]$



f(t)=(2t-2).[U(t)-U(t-2)]+ (-2t+6).[U(t-2)-U(t-4)]+ (2t-10).[U(t-4)-U(t-6)]……

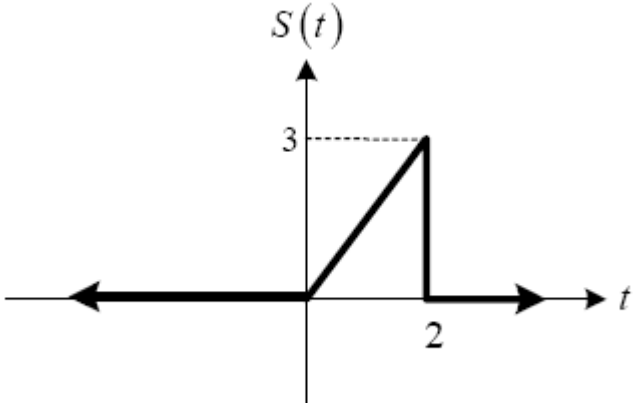


$f(t)=f_1(t)+ f_2(t)+ f_3(t)$

$f_1(t) = 2\,t.\,U(t)-2(t-1)U(t-1)-2U(t-2)$

$f_2(t)= (-4t+10)\,[U(t-2)-U(t-3)]$

$f_3(t)= (2t-8)\,[U(t-3)-U(t-4)]$



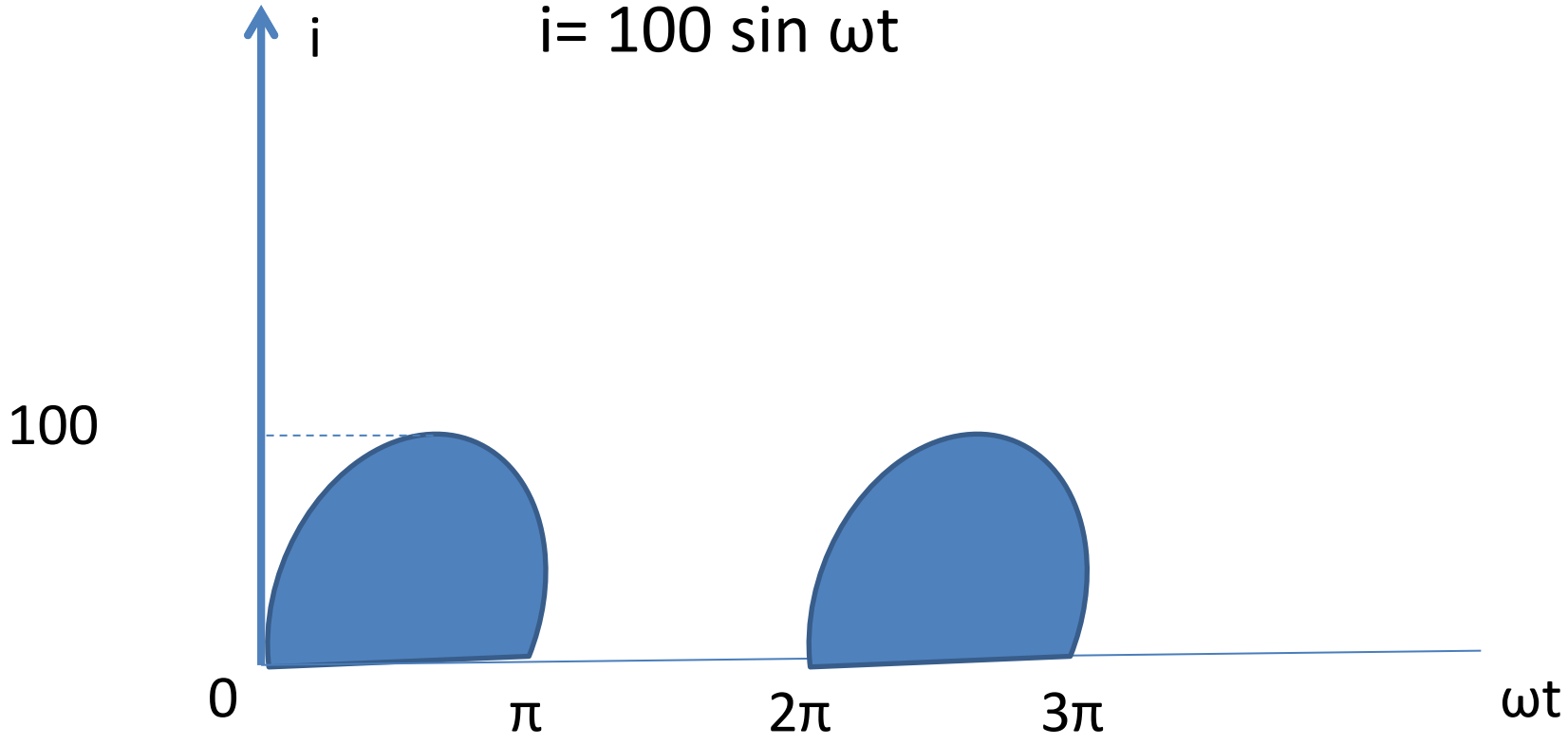
The signal between the interval of $0 \le t \le 2$ is a line between two points $P_1(t_1 = 0, s_1 = 0)$ and $P_2(t_2 = 2, s_2 = 3)$ given by equation:

$$S(t) = \frac{s_2 - s_1}{t_2 - t_1}(t - t_1) = \frac{3-0}{2-0}(t-0) = \frac{3}{2}t \quad \text{for} \quad 0 \le t \le 2$$

$$S(t) = 0 \quad \text{otherwise}$$

$$S(t) = \frac{3}{2}t\left[u(t) - u(t-2)\right]$$

Calculate the form factor and peak factor?



- i= 100 sin ωt, 0< ωt<π

  = 0, π< ωt<2π

$$I_{av} = \frac{1}{2\pi}\left\{\int_0^{\pi} i\, d(\omega t) + \int_{\pi}^{2\pi} 0\, d(\omega t)\right\}$$

= 31.8 A