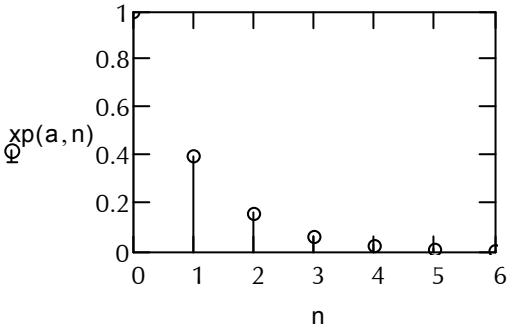
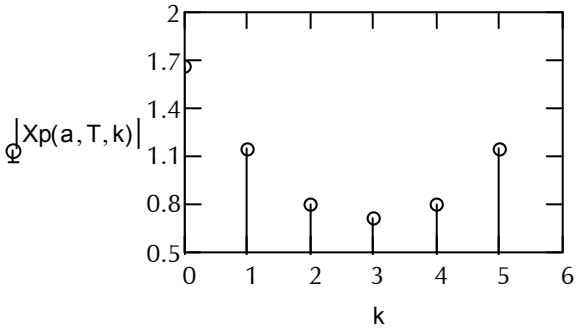
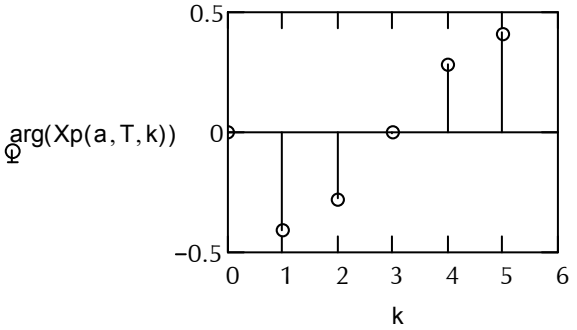
1) Последовательность Показательных Импульсов

(1)

$a := 0.4 \quad T := 6 \qquad n := 0 .. T \quad xp(a,n) := a^n \qquad k := 0 .. T-1 \quad Xp(a,T,k) := \sum_{n=0}^{T-1} \left(xp(a,n) \cdot e^{-i \cdot 2 \cdot \frac{\pi n \cdot k}{T}} \right)$

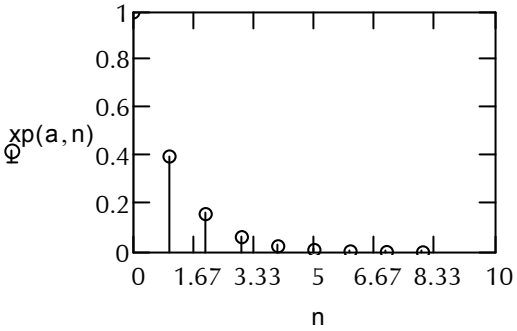


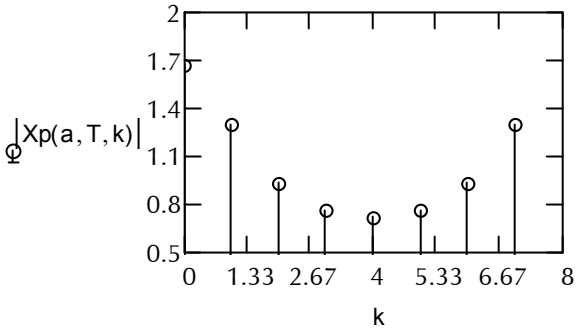


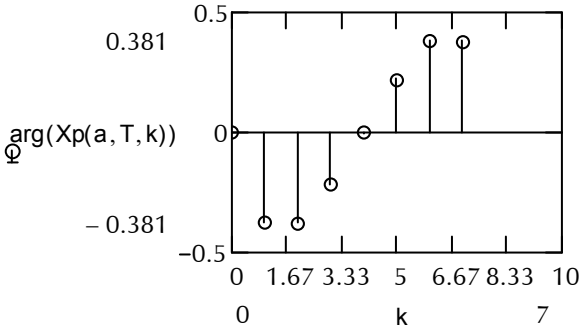


(2)

$a := 0.4 \quad T := 8 \qquad n := 0 .. T \quad k := 0 .. T-1$

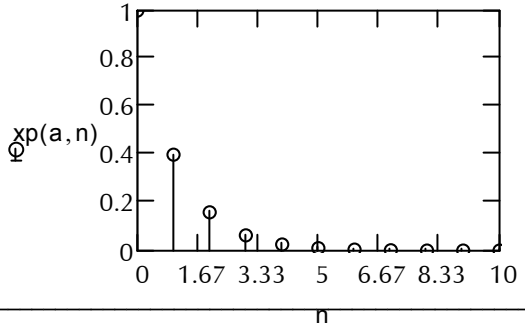


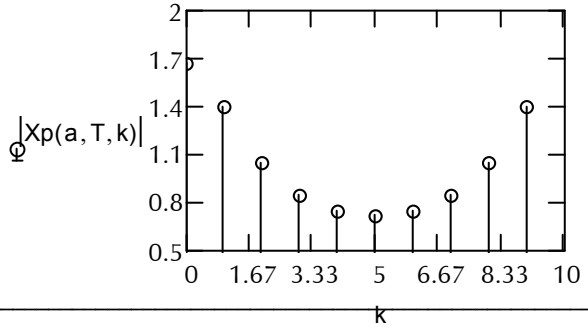


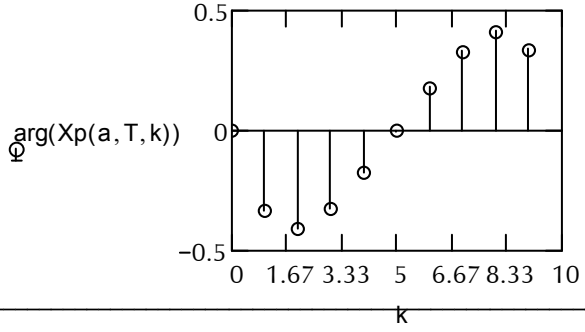


(3)

$a := 0.4 \quad T := 10 \qquad n := 0 .. T \quad k := 0 .. T-1$

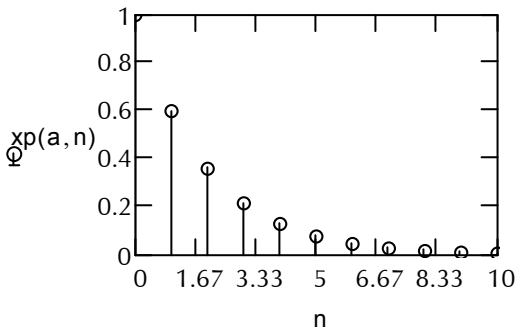


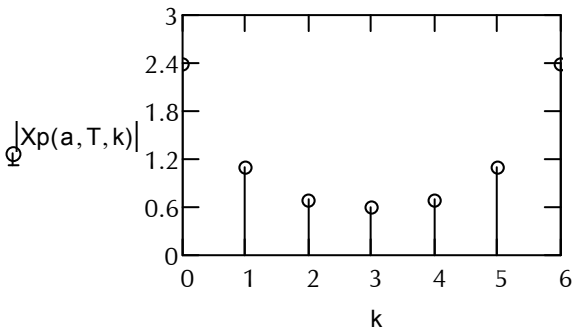


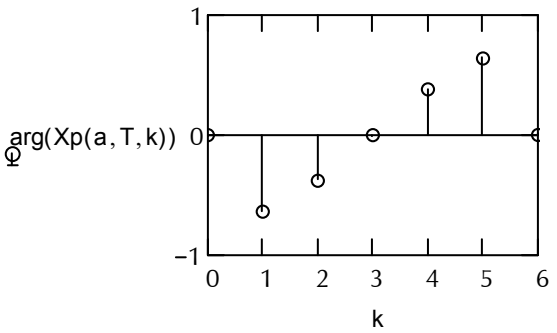


(4)

$a := 0.6 \quad T := 6$

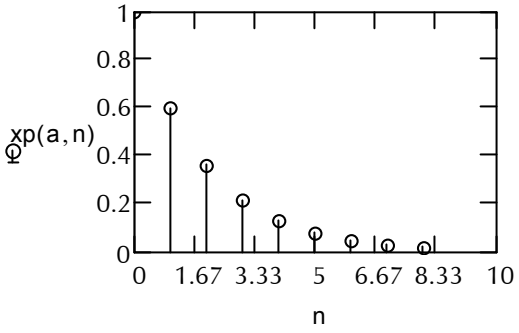


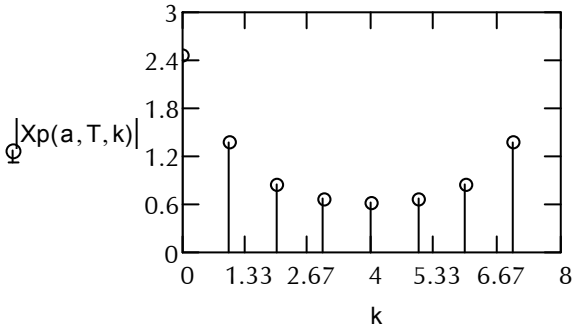


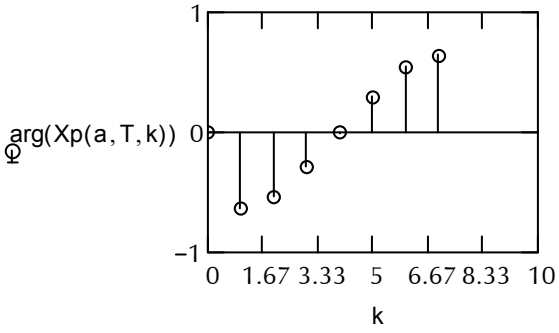


(5)

$a := 0.6 \quad T := 8 \quad n := 0 .. T \quad k := 0 .. T - 1$

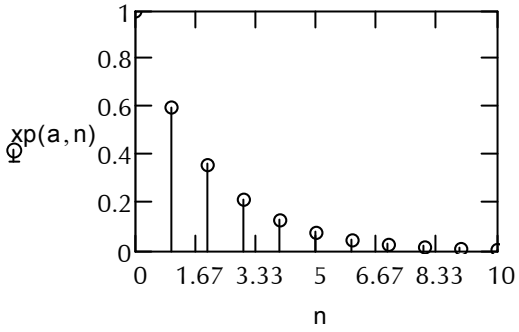


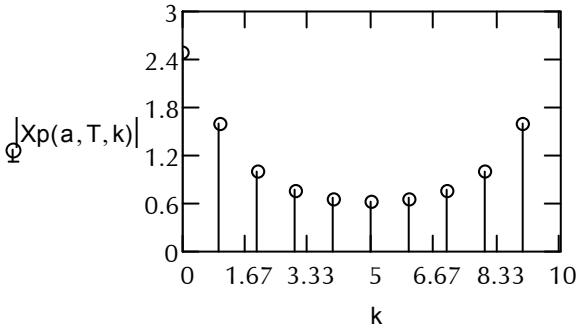


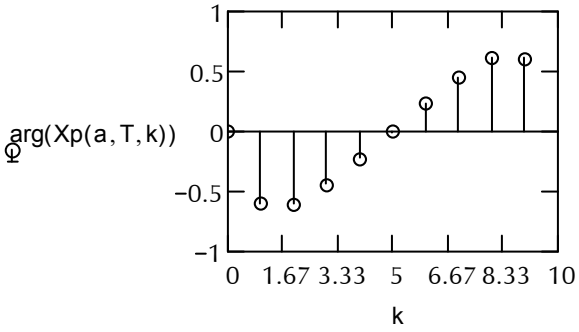


(6)

$a := 0.6 \quad T := 10 \quad n := 0 .. T \quad k := 0 .. T - 1$

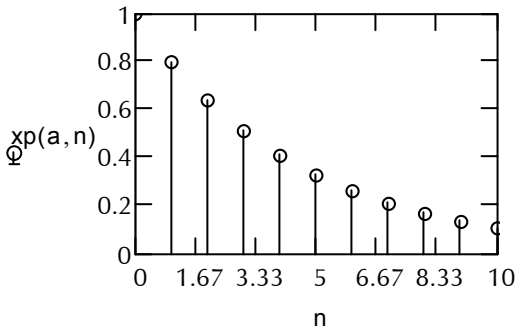


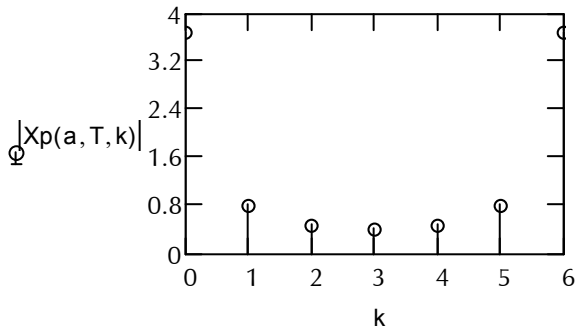


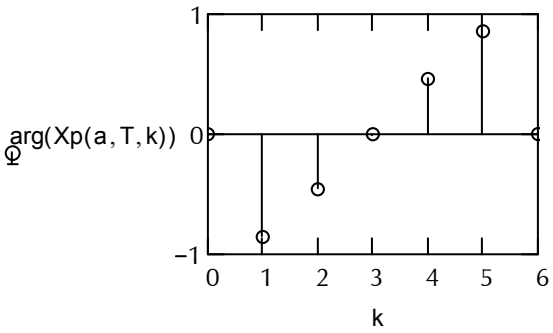


(7)

$a := 0.8 \quad T := 6$

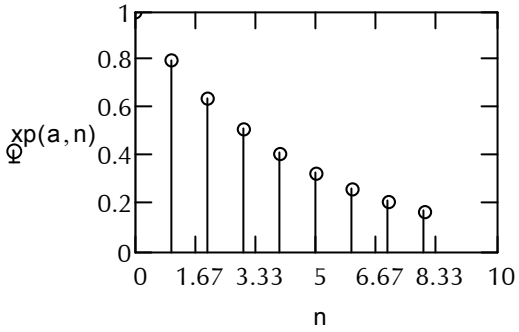


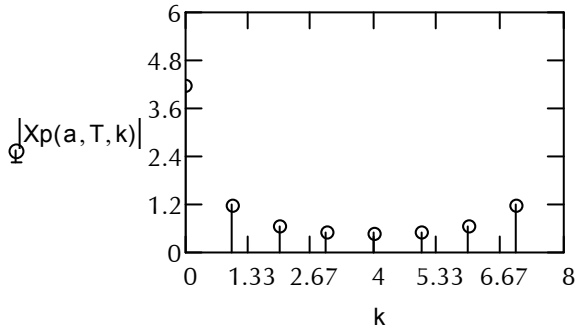


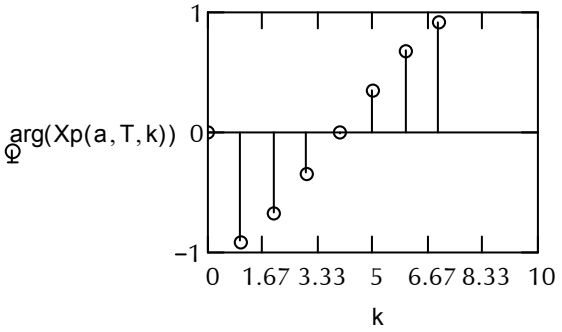


(8)

$a := 0.8 \quad T := 8 \quad n := 0 .. T \quad k := 0 .. T - 1$

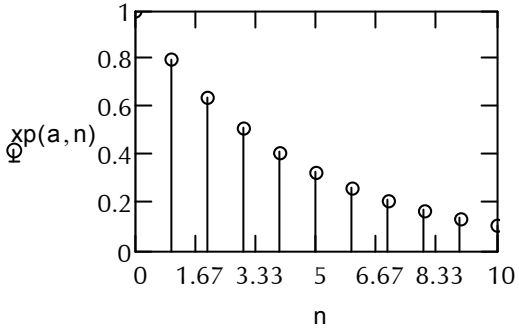


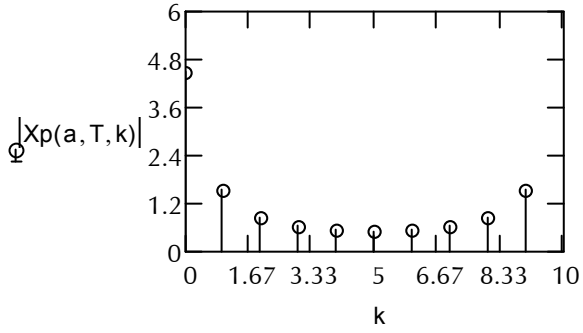


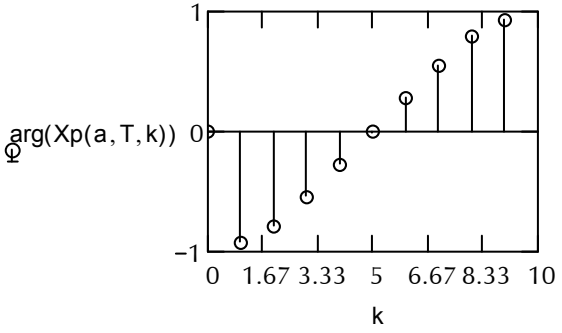


(9)

$a := 0.8 \quad T := 10 \quad n := 0 .. T \quad k := 0 .. T - 1$



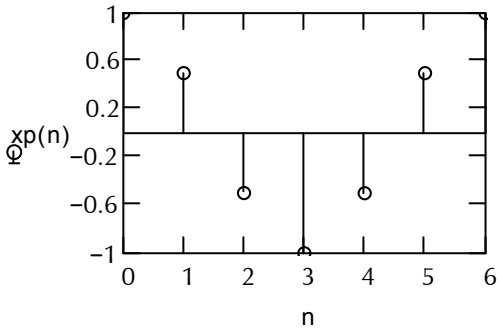


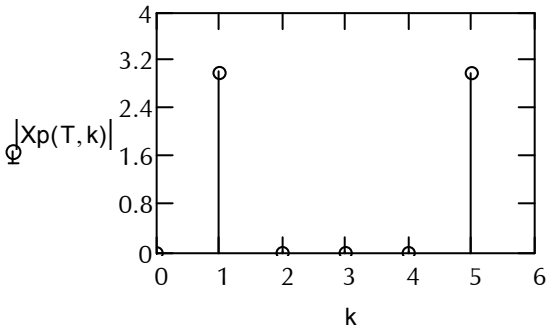


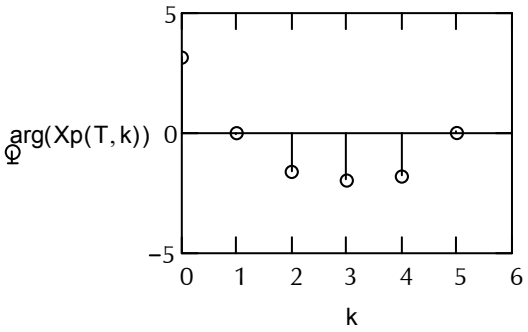
2) Косинусоидальное Колебание

(1)

$T := 6$ $n := 0 .. T$ $xp(n) := \cos\left(2 \cdot \frac{\pi n}{T}\right)$ $k := 0 .. T - 1$ $Xp(T,k) := \left(\frac{1}{2}\right) \cdot \sum_{n=0}^{T-1} e^{-i \cdot 2 \cdot \frac{\pi n \cdot (k-1)}{T}} + \left(\frac{1}{2}\right) \cdot \sum_{n=0}^{T-1} e^{-i \cdot 2 \cdot \frac{\pi n \cdot (k+1)}{T}}$

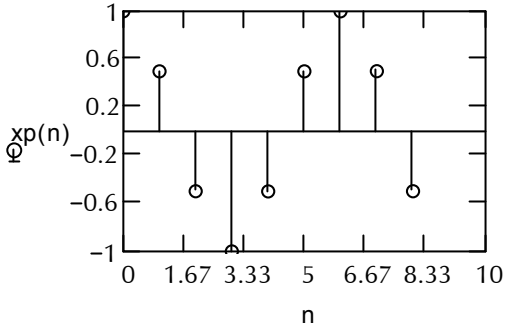


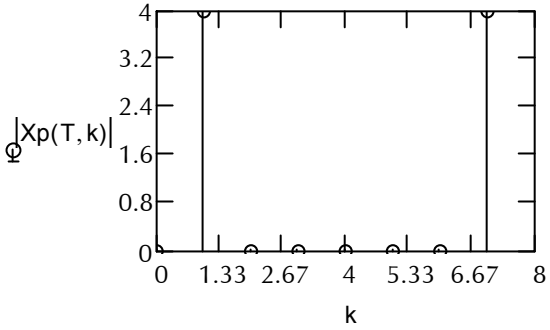


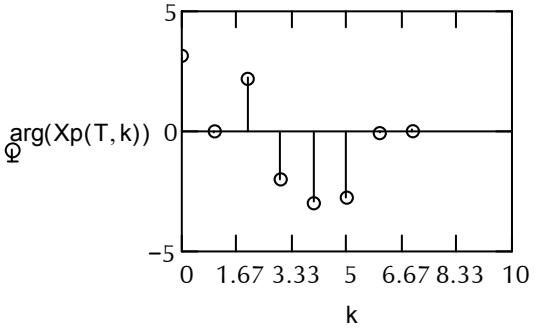


(2)

$T := 8$ $n := 0 .. T$ $k := 0 .. T - 1$

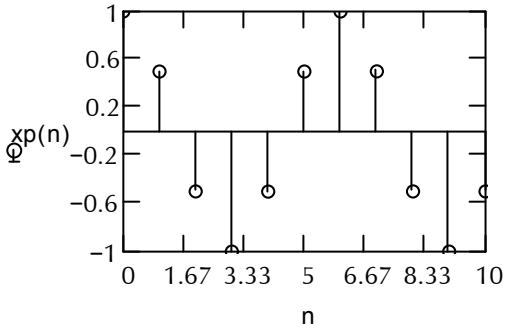


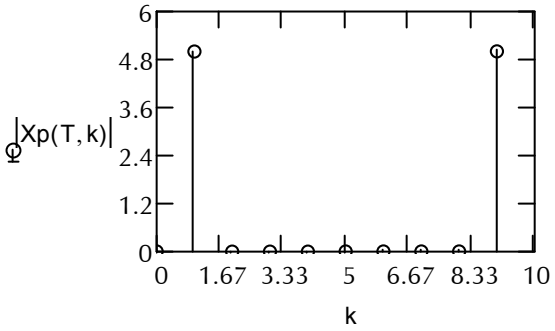


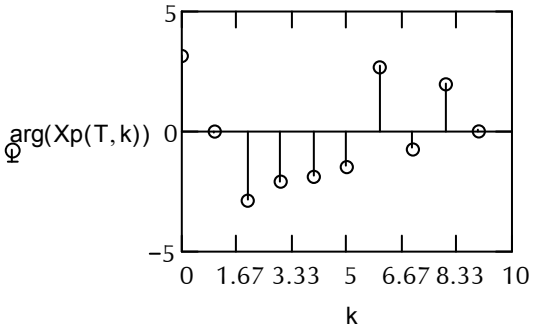


(3)

$T := 10$ $n := 0 .. T$ $k := 0 .. T - 1$



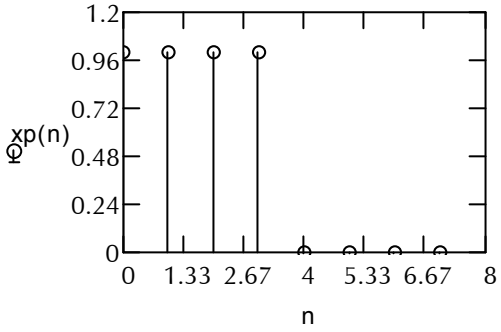


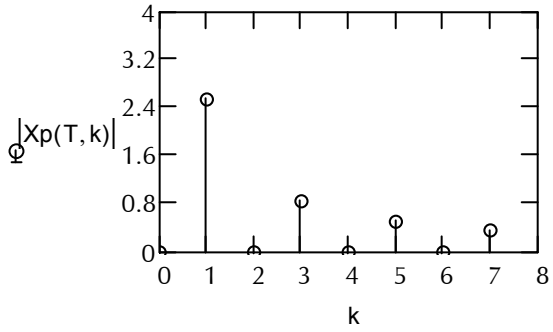


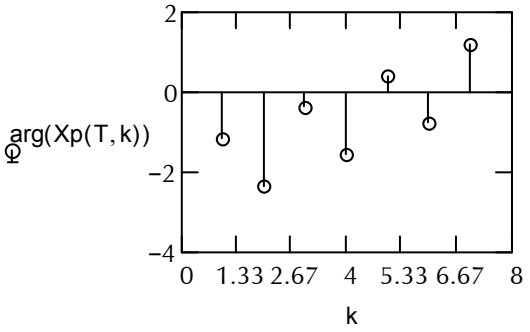
3) Последовательность Прямоугольных Импульсов

$T := 8$ $n := 0 .. T$ $ni := 4$ $xp(n) := \begin{cases} 1 & \text{if } 0 \le n \le (ni - 1) \\ 0 & \text{if } ni \le n \le (T - 1) \end{cases}$ $k := 0 .. T - 1$ $Xp(T, k) := e^{-i \cdot \pi \cdot \frac{k \cdot (ni - 1)}{T}} \cdot \frac{\sin\left(\pi \cdot k \cdot \frac{ni}{T}\right)}{\pi \cdot \frac{k}{T}}$

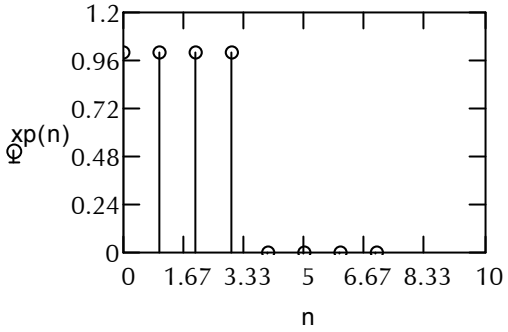
(1)

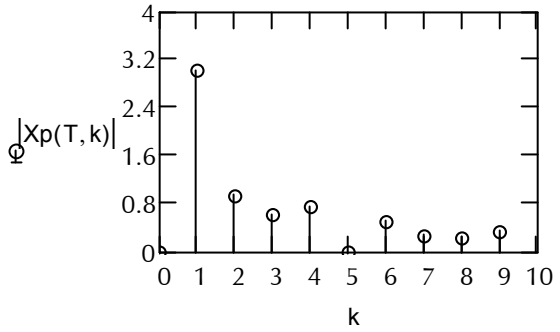


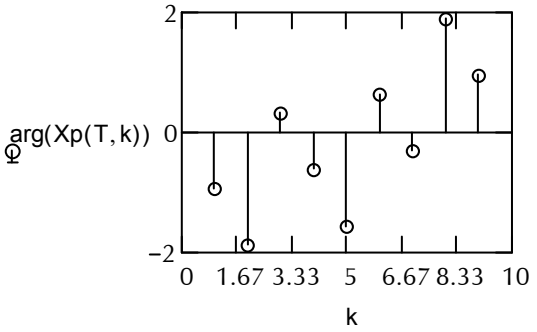




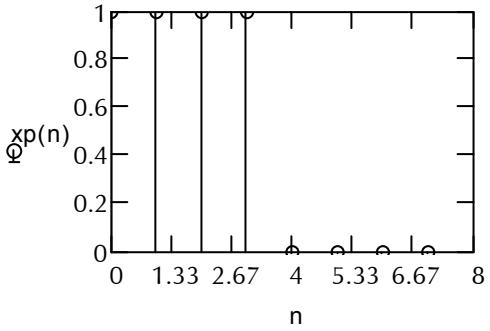
(2) $T := 10$ $n := 0 .. T$ $k := 0 .. T - 1$

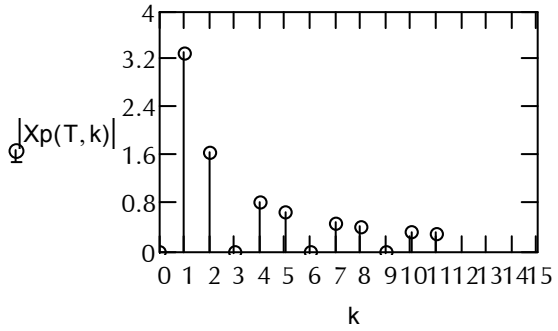


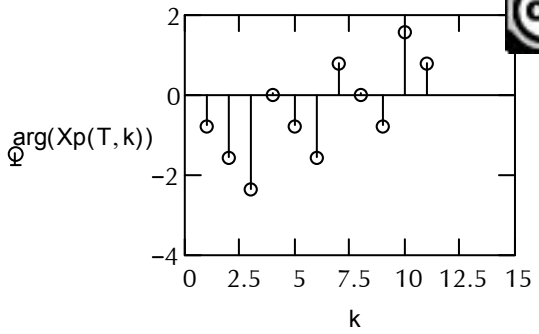




(3) $T := 12$ $n := 0 .. T$ $k := 0 .. T - 1$

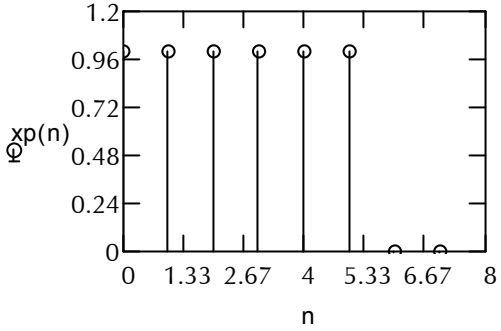


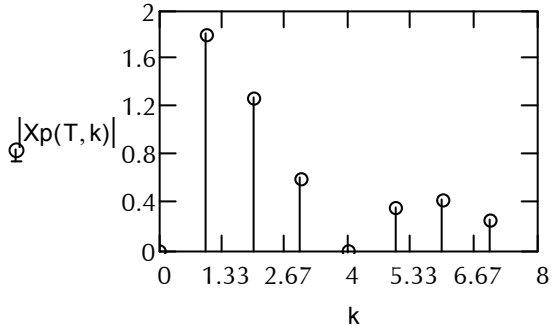


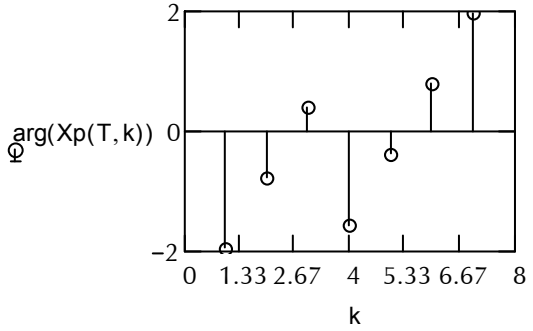


$T := 8 \qquad n := 0 .. T \qquad ni := 6 \qquad xp(n) := \begin{cases} 1 & \text{if } 0 \le n \le (ni - 1) \\ 0 & \text{if } ni \le n \le (T - 1) \end{cases} \qquad k := 0 .. T - 1 \qquad Xp(T,k) := e^{-i \cdot \pi \cdot \frac{k \cdot (ni-1)}{T}} \cdot \frac{\sin\left(\pi \cdot k \cdot \frac{ni}{T}\right)}{\pi \cdot \frac{k}{T}}$

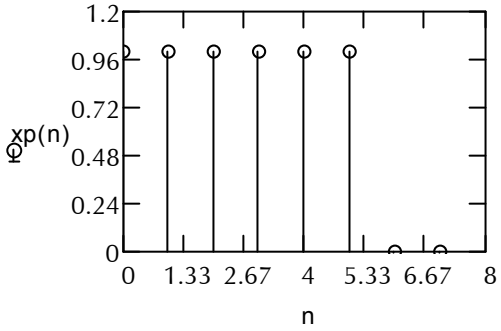
(1)

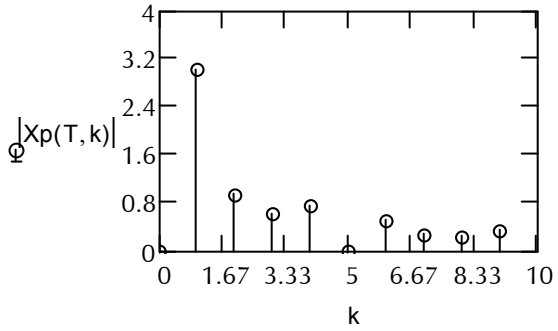


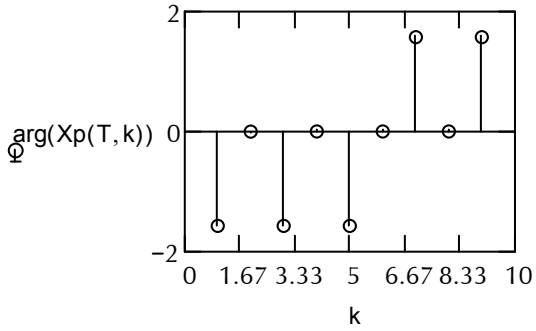




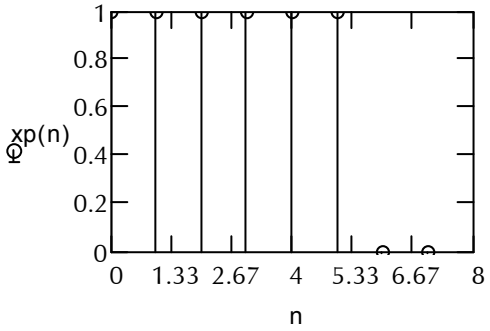
(2) $T := 10 \qquad n := 0 .. T \qquad k := 0 .. T - 1$

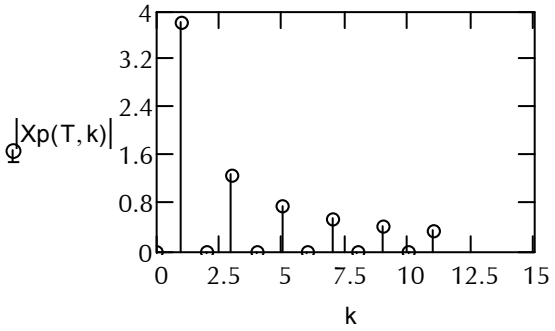


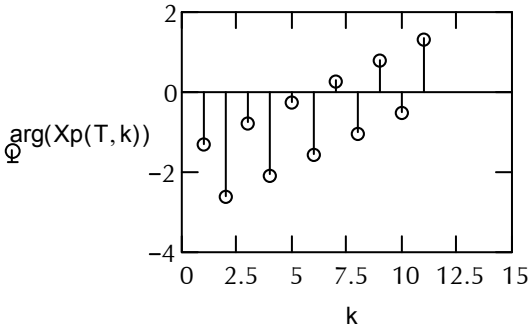




(3) $T := 12 \qquad n := 0 .. T \qquad k := 0 .. T - 1$

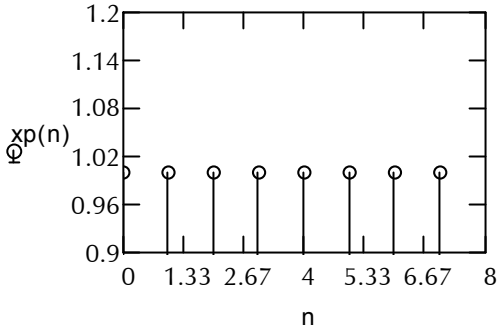


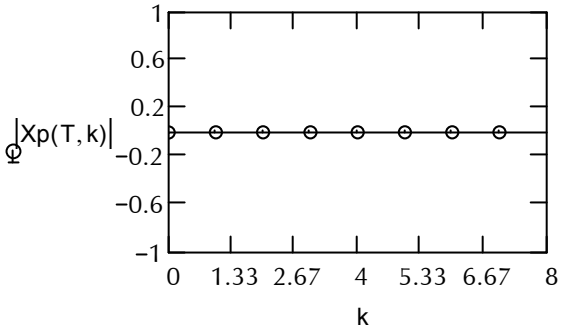


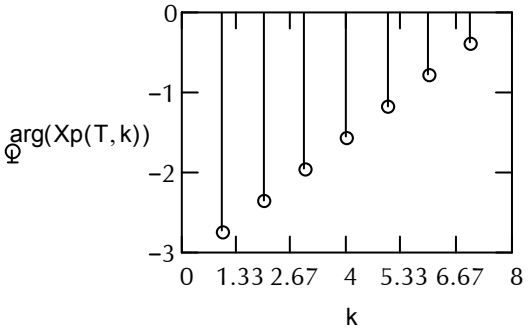


$T := 8$ $n := 0 .. T$ $ni := 8$ $xp(n) := \begin{cases} 1 & \text{if } 0 \le n \le (ni - 1) \\ 0 & \text{if } ni \le n \le (T - 1) \end{cases}$ $k := 0 .. T - 1$ $Xp(T, k) := e^{-i \cdot \pi \cdot \frac{k \cdot (ni - 1)}{T}} \cdot \frac{\sin\left(\pi \cdot k \cdot \frac{ni}{T}\right)}{\pi \cdot \frac{k}{T}}$

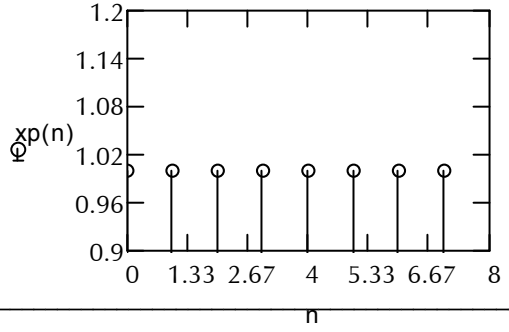
(1)

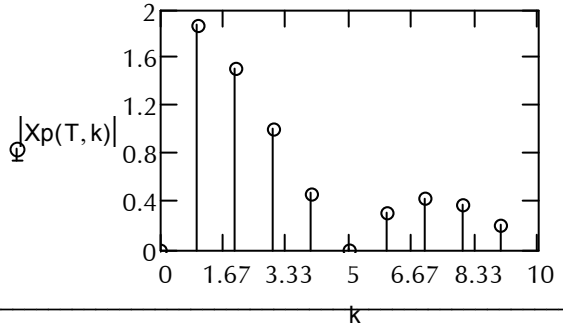


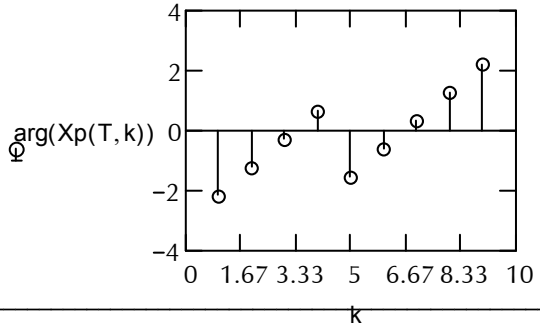




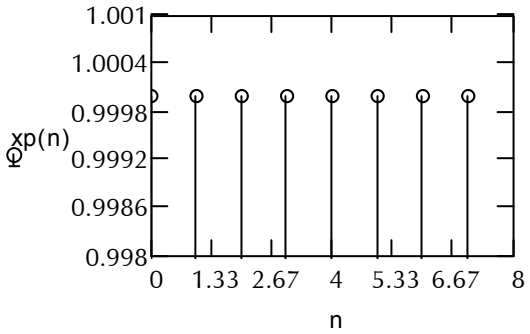
(2) $T := 10$ $n := 0 .. T$ $k := 0 .. T - 1$

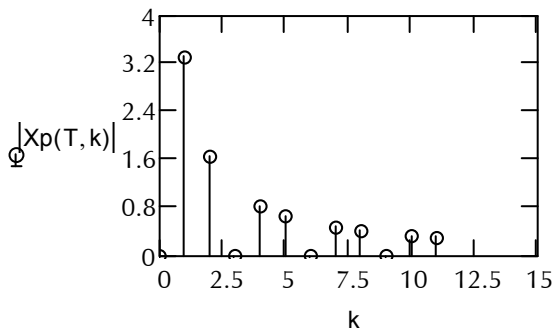


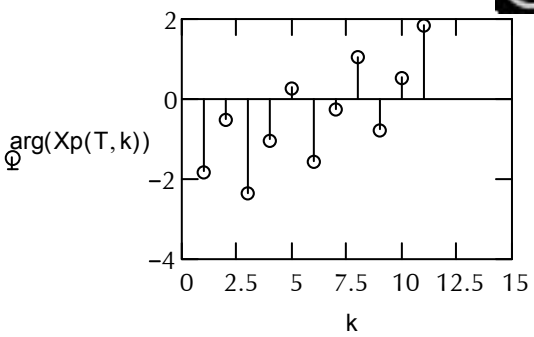




(3) $T := 12$ $n := 0 .. T$ $k := 0 .. T - 1$



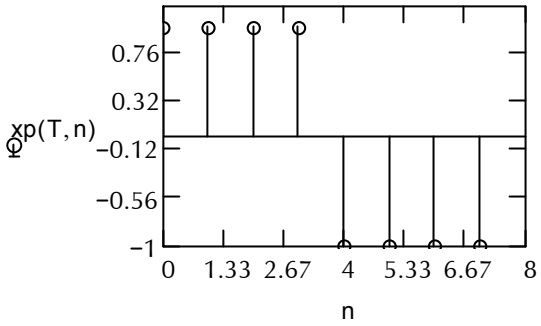


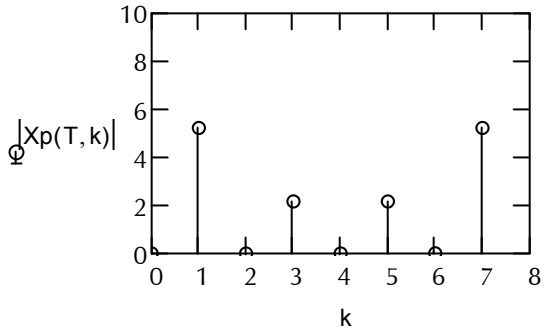


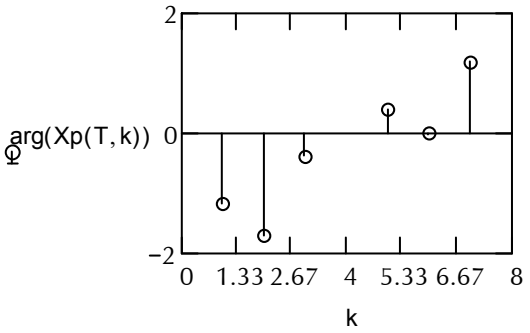
4_Меандр

$T := 8$ $n := 0 .. T$ $xp(T,n) := \begin{cases} 1 & \text{if } 0 \le n \le \left(\frac{T}{2} - 1\right) \\ -1 & \text{if } \frac{T}{2} \le n \le (T - 1) \end{cases}$ $k := 0 .. T - 1$ $Xp(T,k) := \sum_{n=0}^{T-1} \left(xp(T,n) \cdot e^{-i \cdot 2 \cdot \frac{\pi n \cdot k}{T}}\right)$

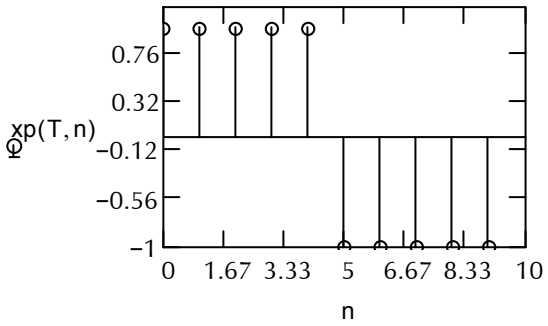
(1)

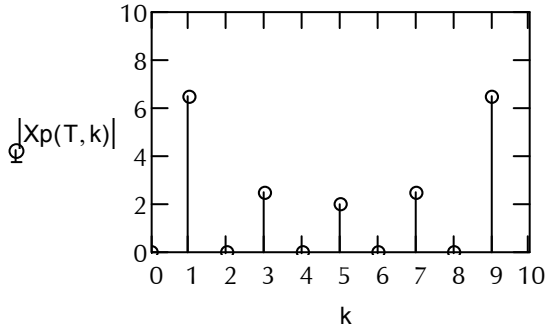


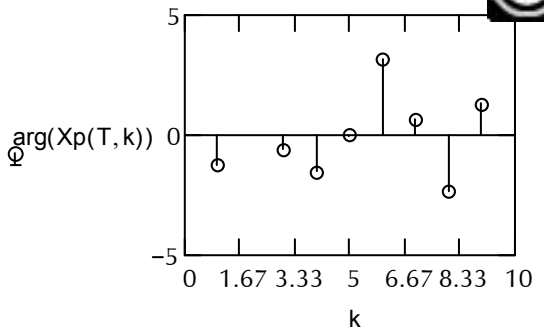




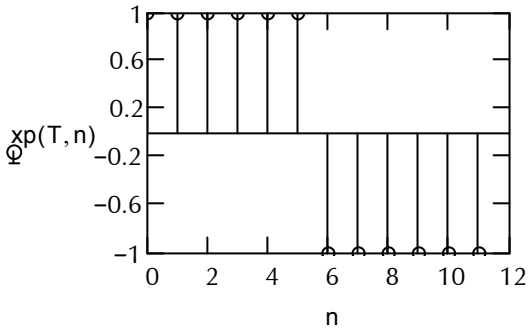
(2) $T := 10$ $n := 0 .. T$ $k := 0 .. T - 1$

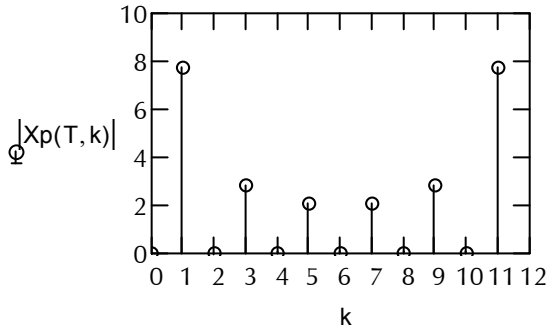


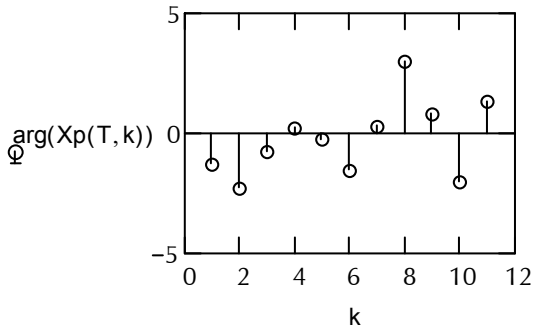




(3) $T := 12$ $n := 0 .. T$ $k := 0 .. T - 1$





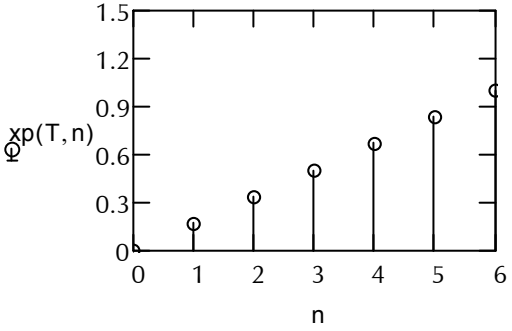


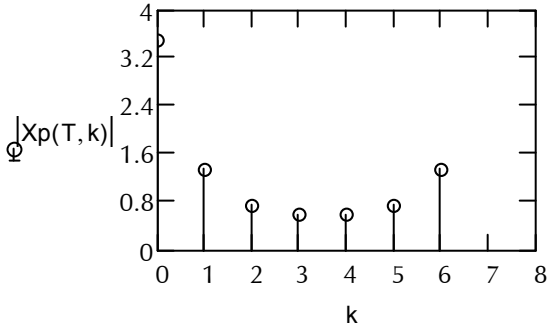
5_Пила

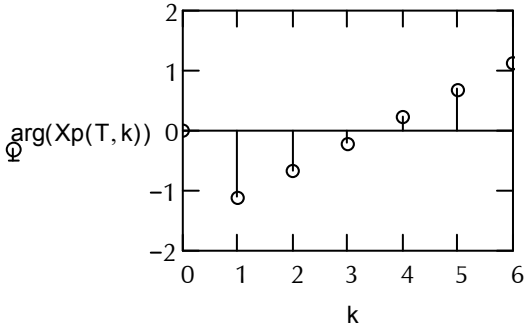
$T := 7$ $n := 0 .. T - 1$ $xp(T, n) := \frac{n}{T - 1}$ $k := 0 .. T - 1$

$$Xp(T,k) := \begin{cases} 0.5 \cdot T & \text{if } k = 0 \\ \frac{T}{2(T-1)\cdot\sin\left(\frac{\pi\cdot k}{T}\right)} \cdot e^{i\cdot\pi\cdot\left(\frac{k}{T}-\frac{1}{2}\right)} & \text{otherwise} \end{cases}$$

(1)







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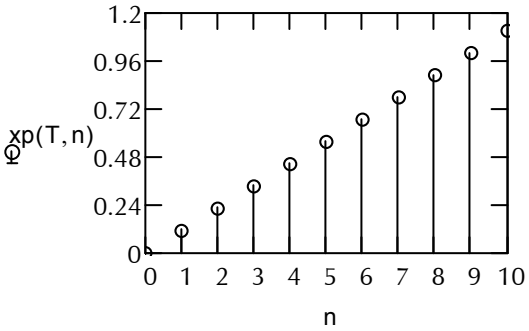
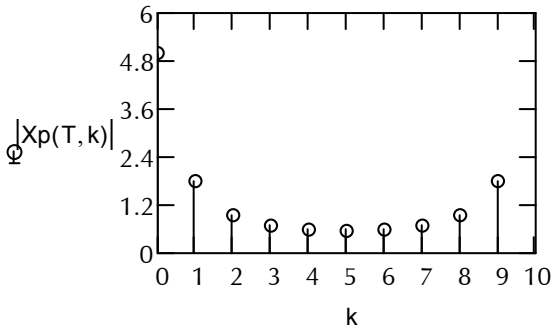
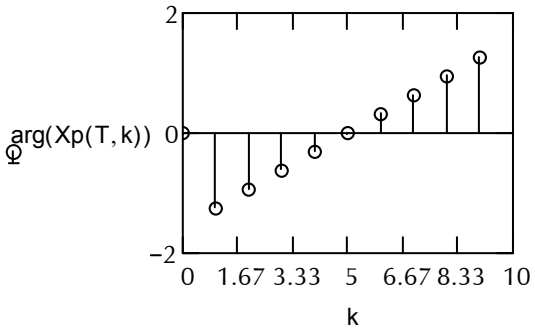
ErliZz (Sutkovoy Sergey)
e-mail: erlizz@list.ru

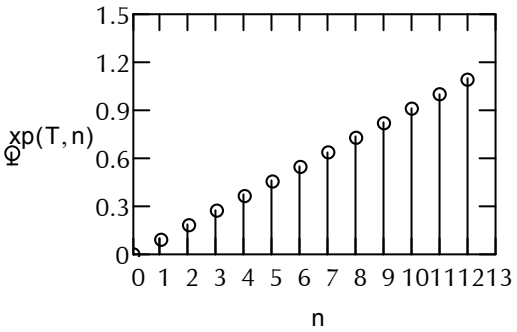
(2) $T := 10$ $n := 0 .. T$ $k := 0 .. T - 1$

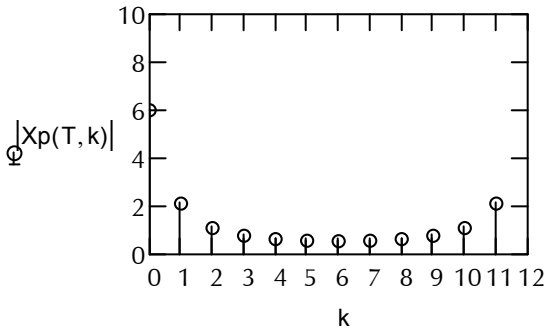


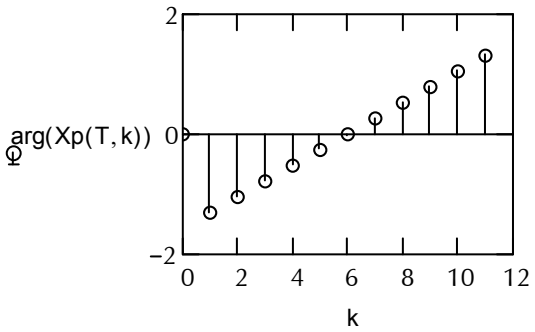




(3) $T := 12$ $n := 0 .. T$ $k := 0 .. T - 1$







6_Треугольники

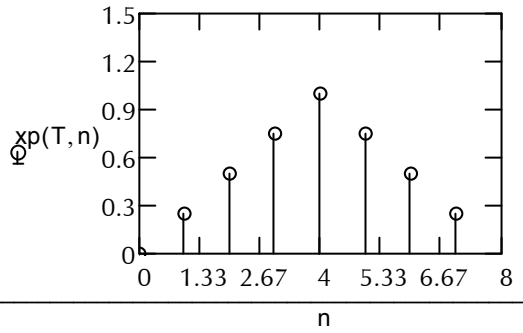
$T := 8$ $n := 0 .. T$

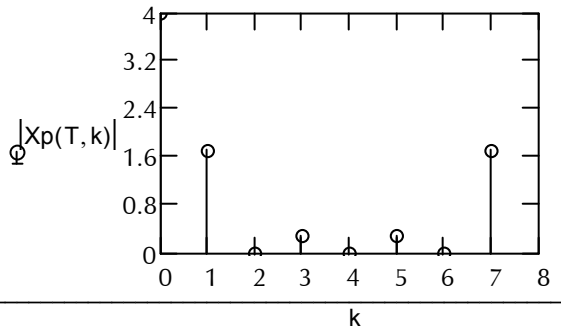
$$xp(T, n) := \begin{cases} 2\dfrac{n}{T} & \text{if } 0 \le n \le \dfrac{T}{2} - 1 \\ 2\left(1 - \dfrac{n}{T}\right) & \text{if } \dfrac{T}{2} \le n \le T - 1 \end{cases}$$

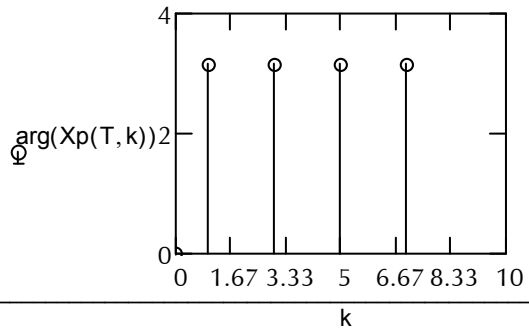
$k := 0 .. T - 1$

$$Xp(T, k) := \begin{cases} 0.5 \cdot T & \text{if } k = 0 \\ \dfrac{(-1)^k - 1}{T \cdot \sin\left(k \cdot \dfrac{\pi}{T}\right)^2} & \text{otherwise} \end{cases}$$

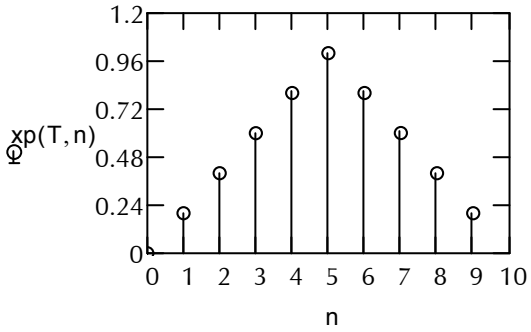
(1)

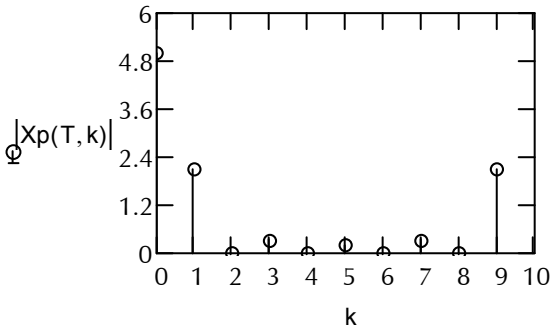


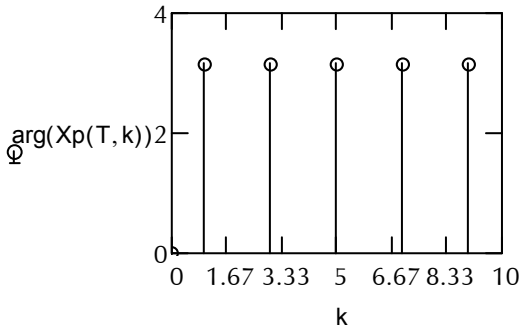




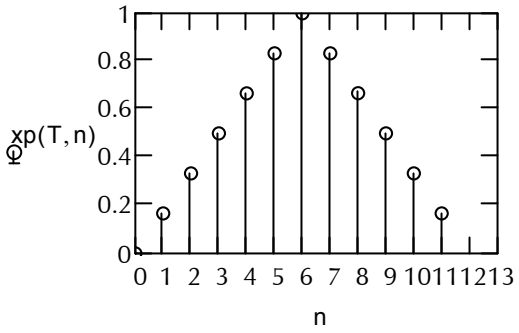
(2) $T := 10$ $n := 0 .. T$ $k := 0 .. T - 1$

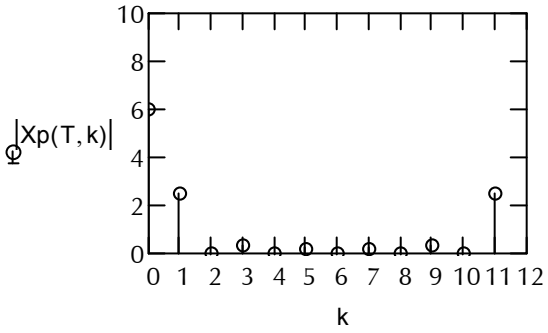


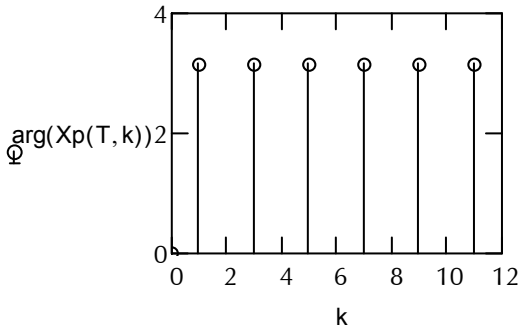




(3) $T := 12$ $n := 0 .. T$ $k := 0 .. T - 1$



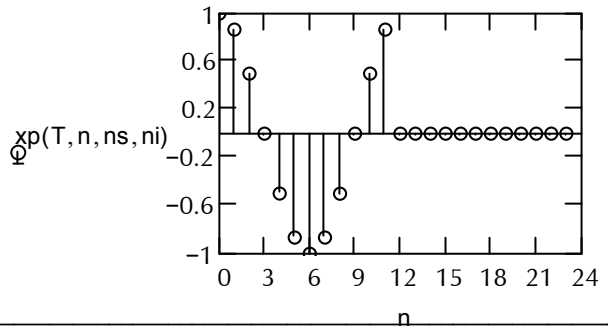


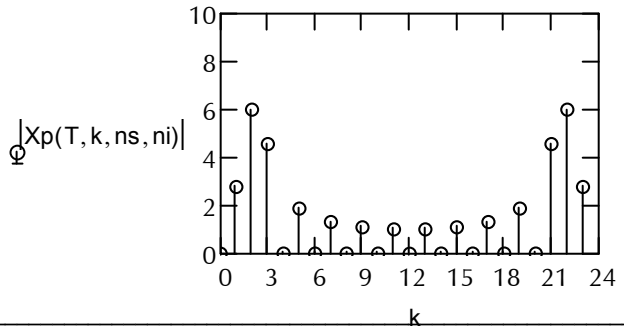


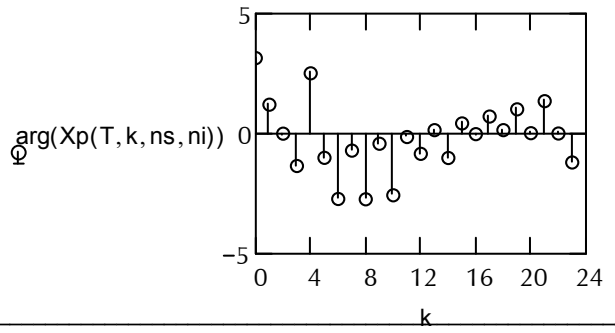
6_Прямоугольный РадиоИмпульс

$ns := 6$ $ni := 2ns$ $T := 2ni$ $n := 0 .. T$ $xp(T, n, ns, ni) := \begin{cases} \cos\left(\frac{\pi \cdot n}{ns}\right) & \text{if } 0 \le n \le ni - 1 \\ 0 & \text{if } ni \le n \le T - 1 \end{cases}$ $k := 0 .. T - 1$ $Xp(T, k, ns, ni) := \sum_{n=0}^{T-1} \left(xp(T, n, ns, ni) \cdot e^{-i \cdot 2 \cdot \frac{\pi n \cdot k}{T}} \right)$

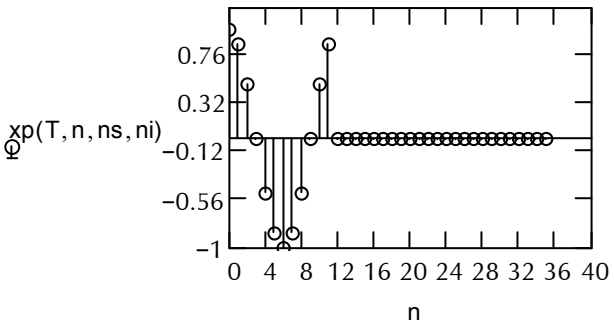
(1)

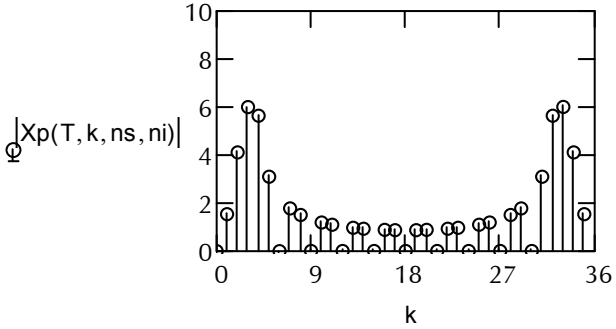


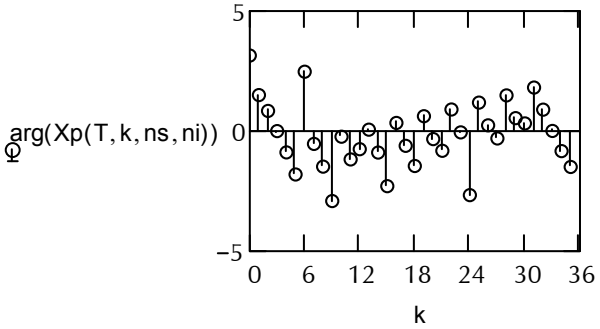




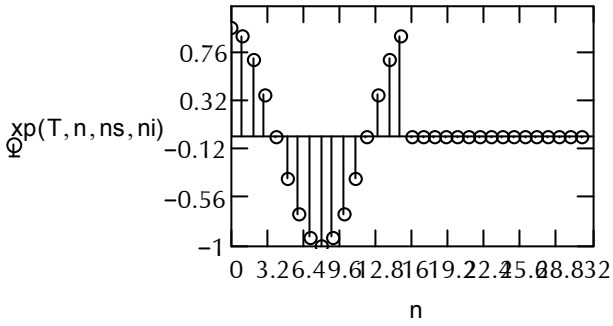
(2) ns := 6 ni := 2ns T := 3ni n := 0 .. T k := 0 .. T − 1

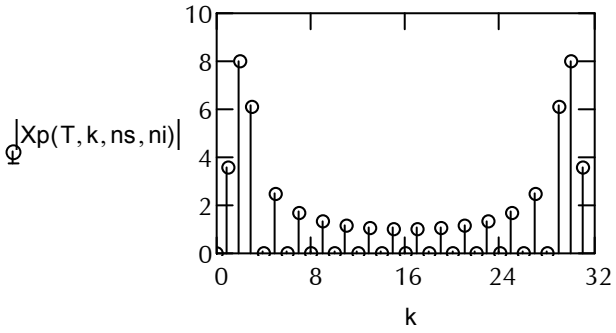


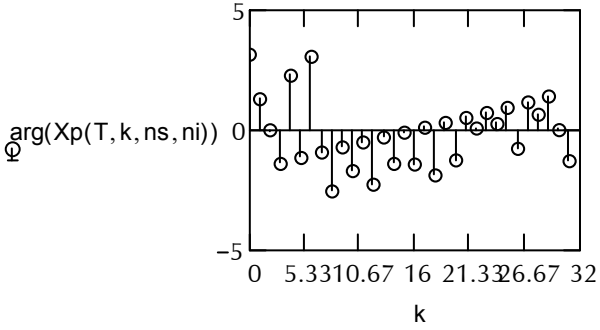




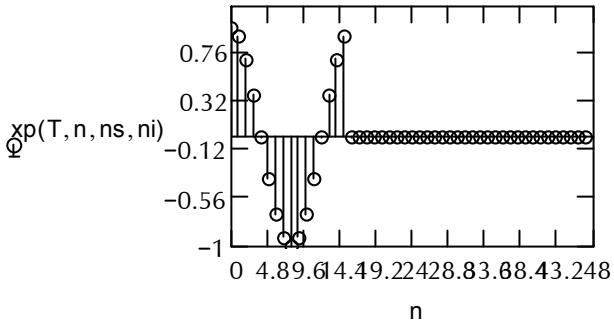
(3) ns := 8 ni := 2ns T := 2ni n := 0 .. T k := 0 .. T − 1

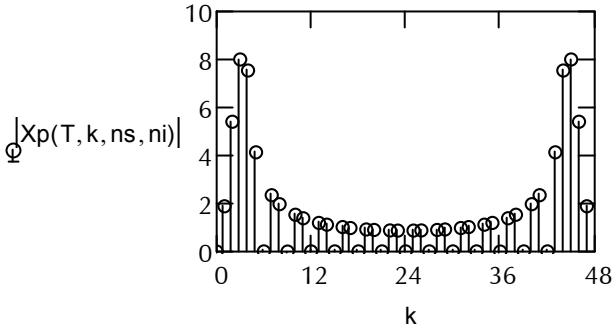


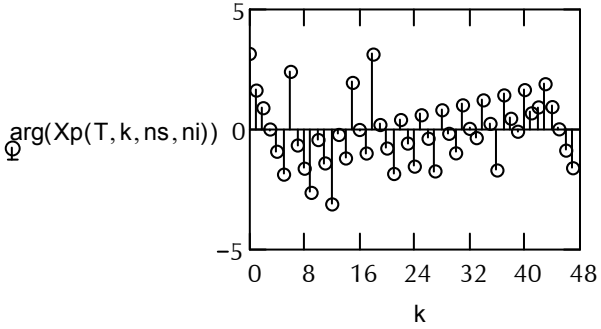




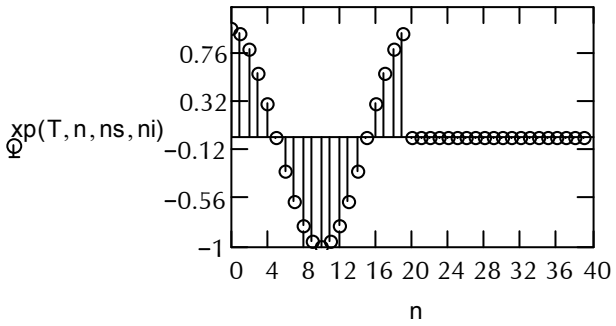
(4) ns := 8 ni := 2ns T := 3ni n := 0 .. T k := 0 .. T − 1

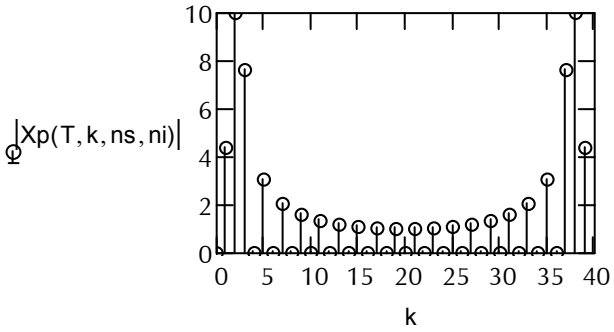


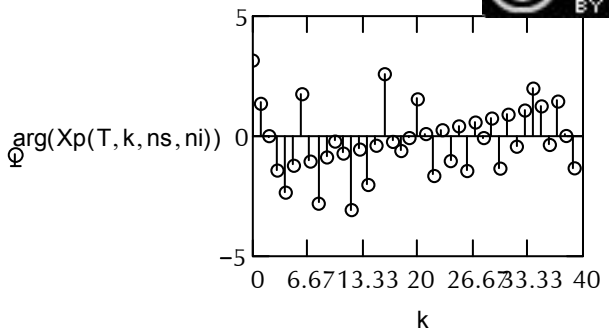




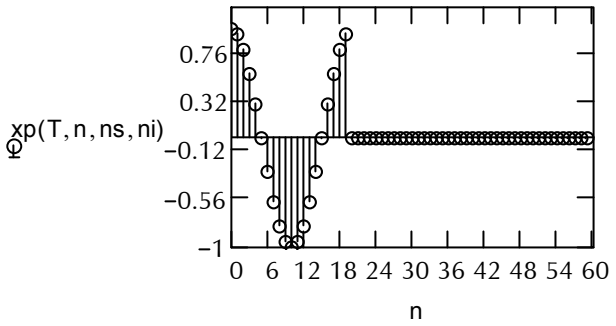
(5) ns := 10 ni := 2ns T := 2ni n := 0 .. T k := 0 .. T − 1

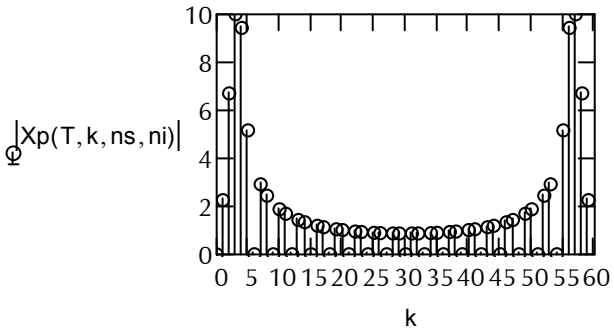


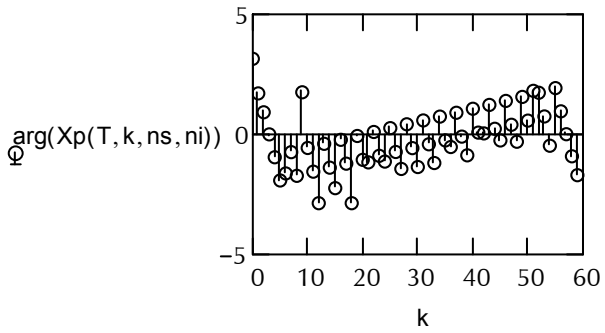




(6) ns := 10 ni := 2ns T := 3ni n := 0 .. T k := 0 .. T − 1







Исследование Непериодических Сигналов

8) Дельта-Функция $N := 8 \quad n := 0 .. N \quad \delta(n) := \begin{cases} 1 & \text{if } n = 0 \\ 0 & \text{otherwise} \end{cases} \quad k := 0 .. N - 1 \quad Xp(N, k) := \sum_{n=0}^{N-1} \left(\delta(n) \cdot e^{-i \cdot 2 \cdot \frac{\pi n \cdot k}{N}} \right)$

(1)

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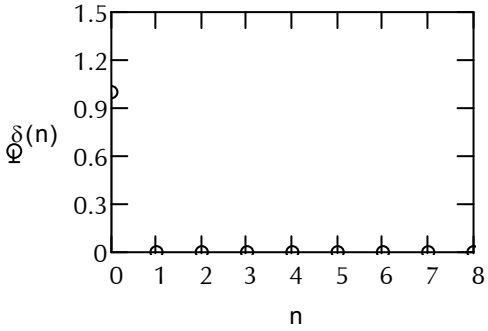
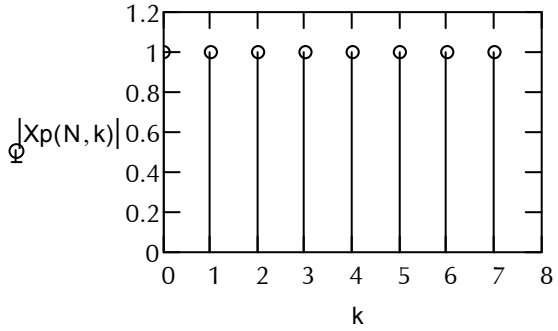
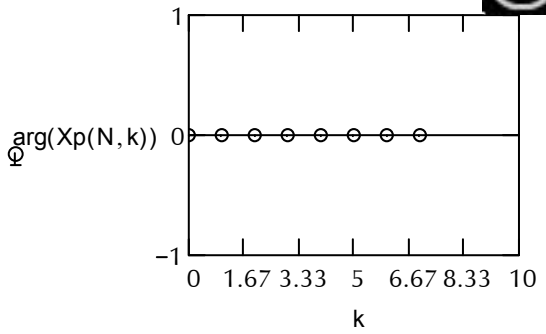
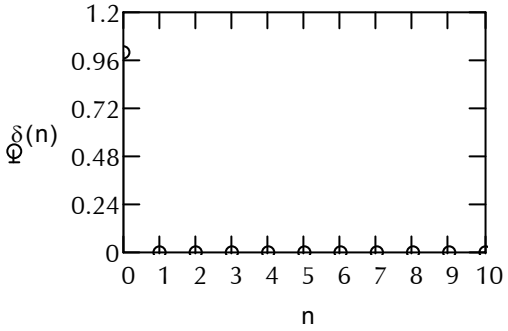
ErliZz (Sutkovoy Sergey)
e-mail: erlizz@list.ru

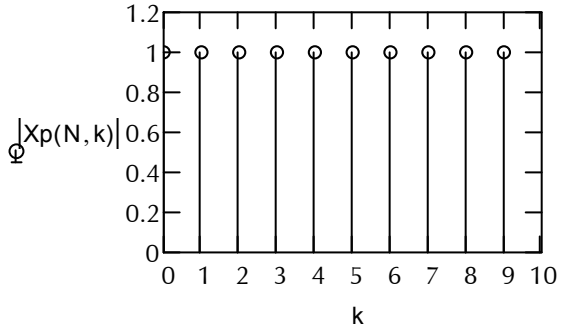


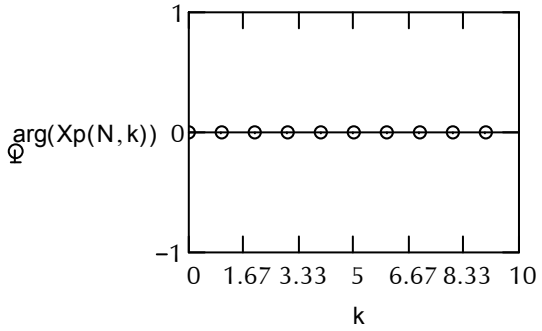




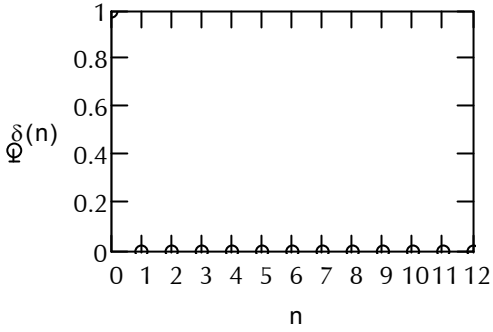
(2) $T := 10$ $n := 0 .. T$ $k := 0 .. T - 1$

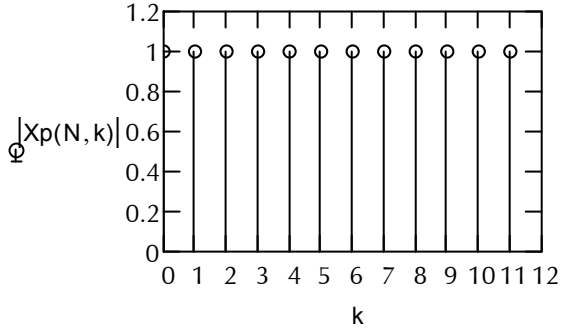


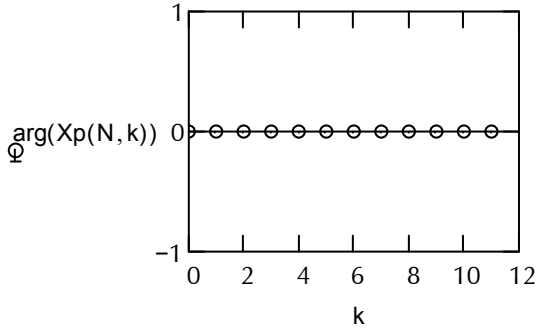




(3) $T := 12$ $n := 0 .. T$ $k := 0 .. T - 1$







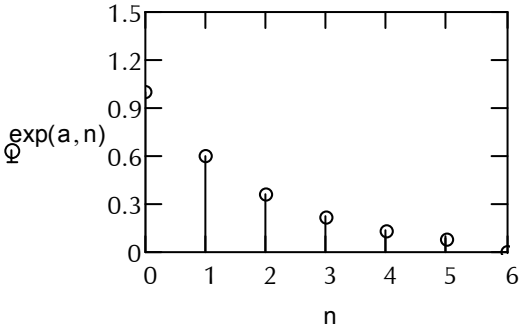
9) Показательный Импульс

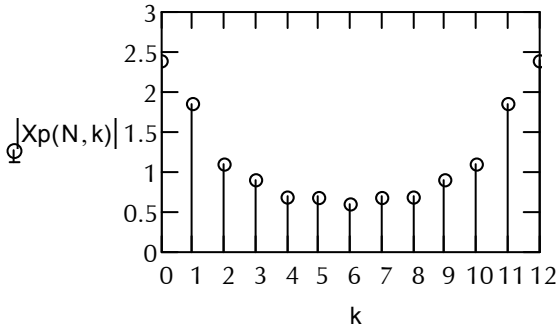
$a := 0.6$ $N := 6$ $n := 0 .. N$ $L := 12$ $k := 0 .. L$

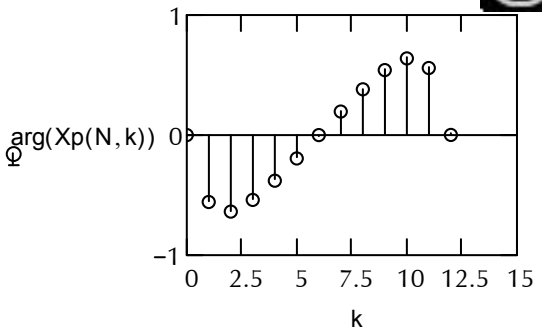
$$exp(a,n) := \begin{cases} a^n & \text{if } 0 \le n \le N-1 \\ 0 & \text{otherwise} \end{cases}$$

$$Xp(N,k) := \sum_{n=0}^{N-1} \left(exp(a,n) \cdot e^{-i \cdot 2 \cdot \frac{\pi n \cdot k}{L}} \right)$$

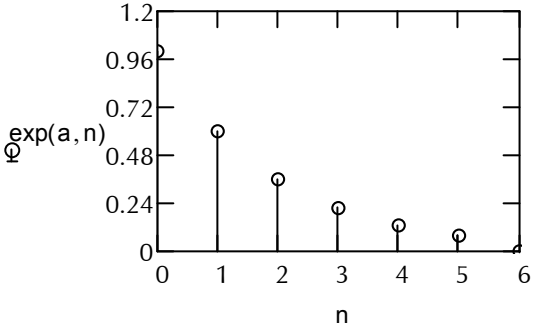
(1)

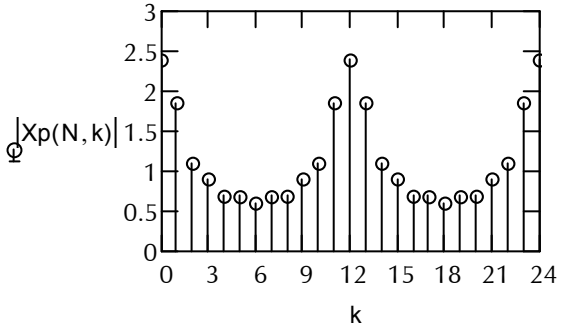


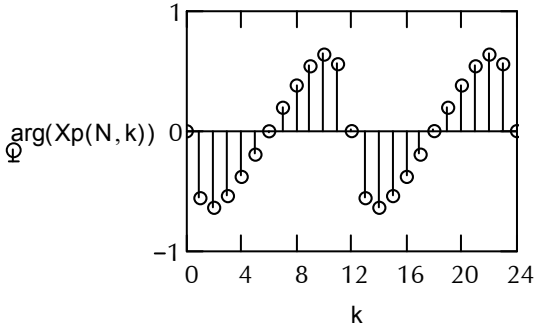




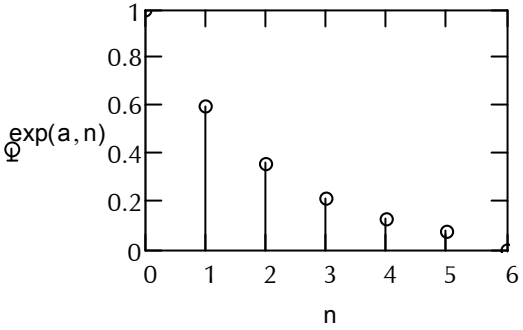
(2) L := 24 k := 0 .. L

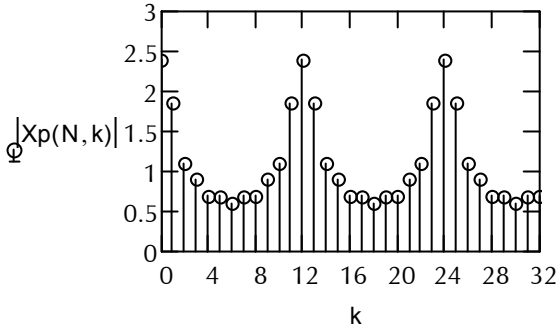


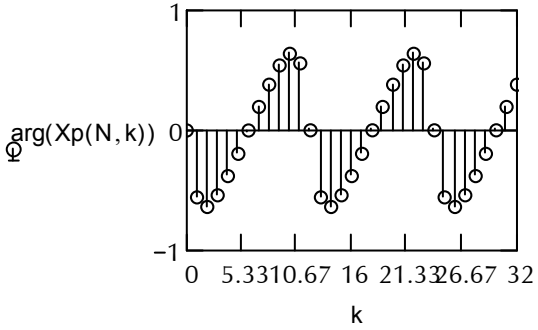




(3) L := 32 k := 0 .. L



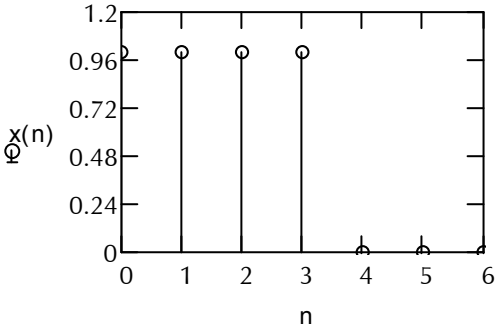


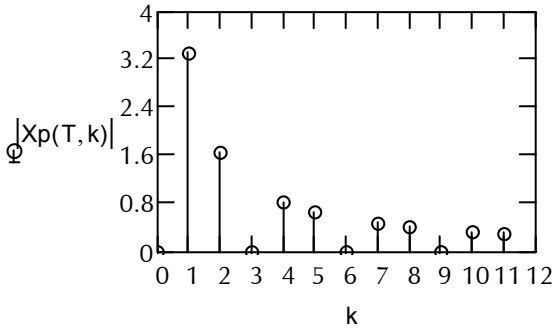


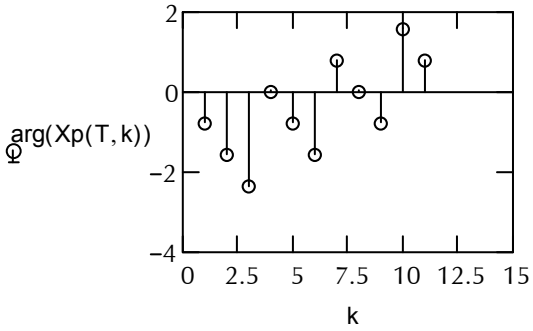
9) Прямоугольный Импульс

$L := 12$ $ni := 4$ $x(n) := \begin{cases} 1 & \text{if } 0 \le n \le (ni - 1) \\ 0 & \text{otherwise} \end{cases}$ $k := 0 .. L - 1$ $Xp(L, k) := e^{-i \cdot \pi \cdot \frac{k \cdot (ni - 1)}{L}} \cdot \frac{\sin\left(\pi \cdot k \cdot \frac{ni}{L}\right)}{\pi \cdot \frac{k}{L}}$

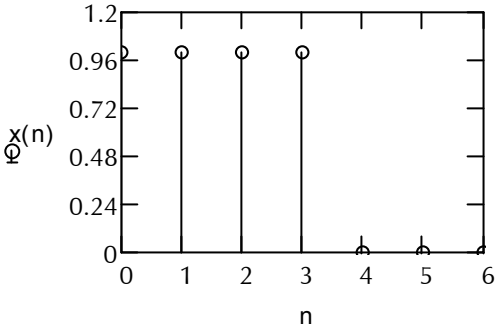
(1)

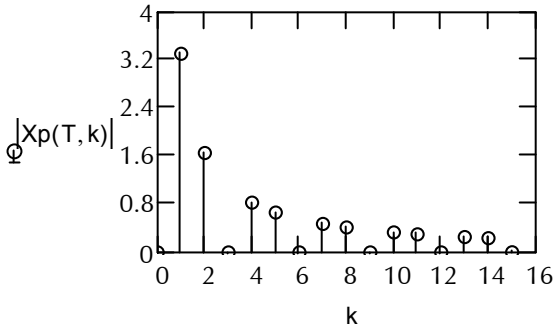


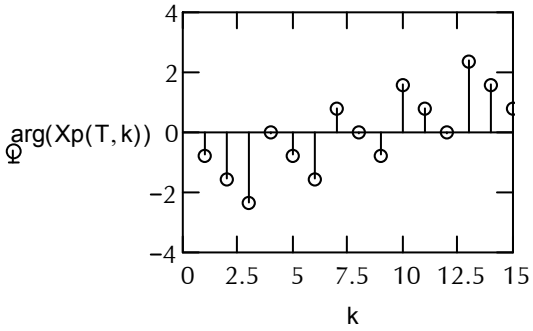




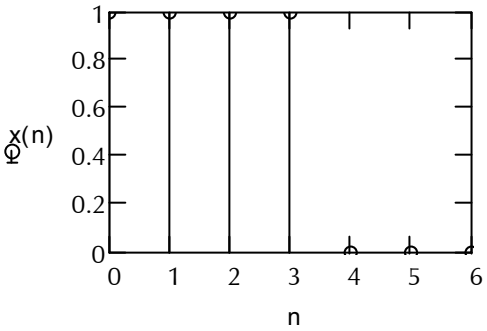
(2) $L := 16$ $k := 0 .. L - 1$

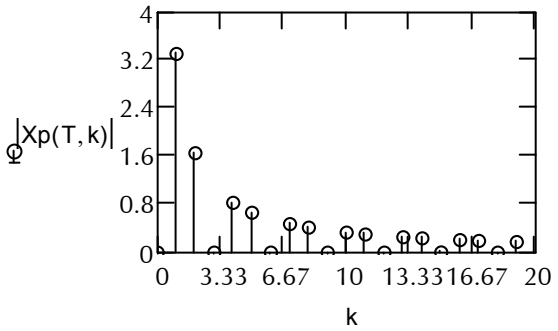


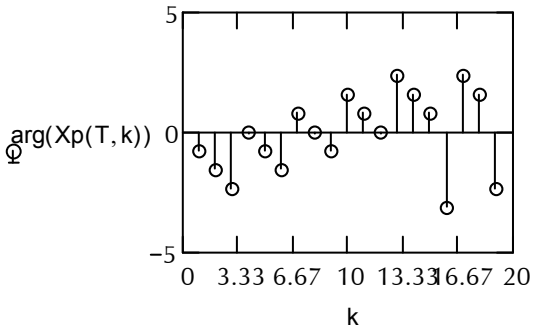




(3) $L := 20$ $k := 0 .. L - 1$







11_Прямоугольный РадиоИмпульс

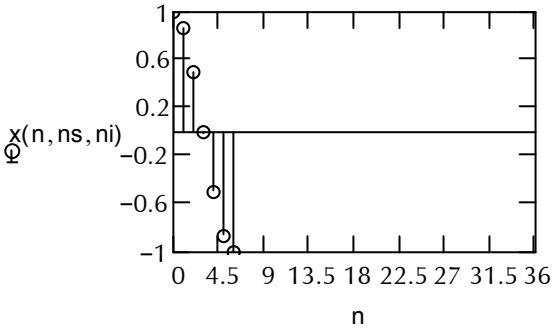
$ns := 6 \quad ni := 12 \quad L := 36$

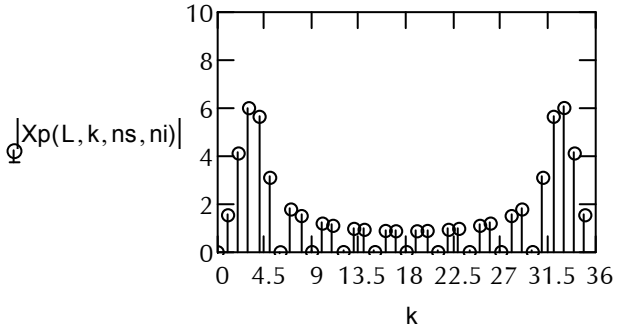
$$x(n, ns, ni) := \begin{cases} \cos\left(\frac{\pi \cdot n}{ns}\right) & \text{if } 0 \le n \le ni - 1 \\ (0) & \text{otherwise} \end{cases}$$

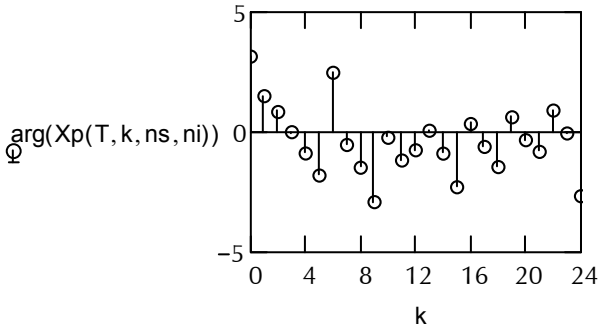
$k := 0 .. L - 1$

$$Xp(T, k, ns, ni) := \sum_{n=0}^{L-1} \left(x(n, ns, ni) \cdot e^{-i \cdot 2 \cdot \frac{\pi n \cdot k}{L}} \right)$$

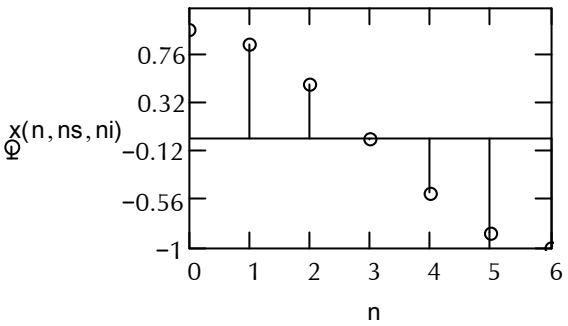
(1)

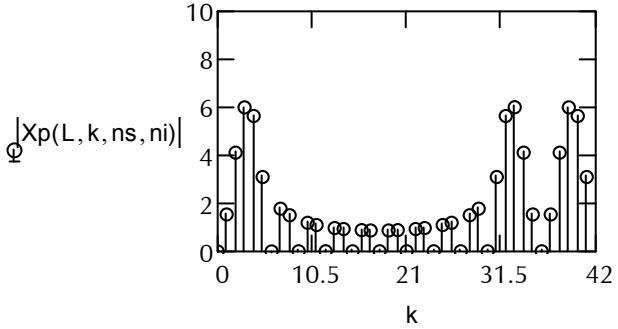


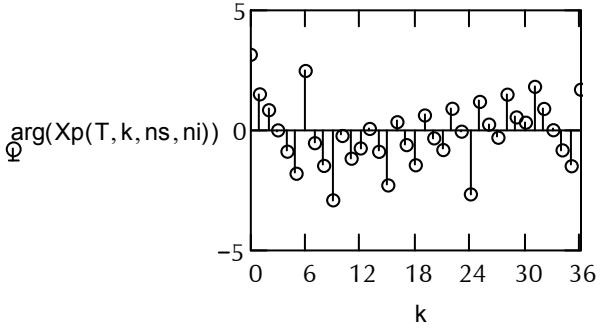




(2) $L := 42 \quad k := 0 .. L - 1$







(3) $L := 48 \quad k := 0 .. L - 1$