COEFFICIENTE
DISTRIB.
BINOMIALI

P se esce il 6

$$P(X=2) = \binom{6!}{2!\,4!} p^2(1-p)^4 = 15\,p^2(1-p)^4$$

$1-p$ se non esce il 6.

$$\frac{720}{2 \cdot 24} = \frac{720}{48} = 15$$

$$\frac{n!}{x!(n-x)!} p^2 (1-p)^4$$

1
1 2 1
1 3 3 1
1 4 6 4 1

$n=6$
$x=2$

$n=2 \quad x=1$

$$\frac{2!}{1!(2-1)!} p^1 (1-p)^1 = 2\,p(1-p)$$

M (6 h, 150000 acari)

$$\boxed{N(t) = at \cdot e^{-bt^2}}$$

(0, 0) $\boxed{0 = 0}$ $\boxed{N'(t) = 0}$

$$N'(t) = a \cdot e^{-bt^2} + at\, e^{-bt^2} \cdot (-2bt) = 0$$

$$= e^{-bt^2} (a - 2abt^2) = 0$$

$$a(1 - 2bt^2) = 0$$

$$1 - 2bt^2 = 0$$

$$t^2 = \frac{1}{2b} \qquad t_{max} = \pm\sqrt{\frac{1}{2b}} = \pm\frac{1}{\sqrt{2b}} = \pm\frac{\sqrt{2b}}{2b}$$

$$\boxed{t_{max} = \frac{\sqrt{2b}}{2b}}$$

$$N(t_{max}) = a \cdot \frac{\sqrt{2b}}{2b} e^{-\cancel{b} \cdot \frac{1}{2\cancel{b}}}$$

$$N(t_{max}) = a \cdot \frac{\sqrt{2b}}{2b} e^{-\frac{1}{2}}$$

$$P_{max} = \left(\frac{\sqrt{2b}}{2b};\ a\frac{\sqrt{2b}}{2b} e^{-\frac{1}{2}}\right)$$

C.E. $b > 0$

$$\begin{cases} \frac{\sqrt{2b}}{2b} = 6 \Rightarrow \sqrt{2b} = 12b \Rightarrow 2b = 144b^2 \\ a\frac{\sqrt{2b}}{2b} e^{-\frac{1}{2}} = 150\,000 \end{cases}$$

$$144b^2 - 2b = 0$$

$$72b^2 - b = 0$$

$\boxed{b > 0}$ $b = \frac{1}{72}$

$$a \cdot 6e^{-\frac{1}{2}} = 150\,000$$

$$a = \frac{\cancel{150\,000}^{25000}}{\cancel{6}_1} e^{\frac{1}{2}}$$

$$\boxed{a = 25\,000\, e^{+\frac{1}{2}}}$$

!!!

25 migliaia

$$\begin{cases} a = 25\,000\, e^{+\frac{1}{2}} = 25 e^{+\frac{1}{2}} \\ b = \frac{1}{72} \end{cases}$$

$$e^{\frac{1}{2}} = \sqrt{e}$$

$$\boxed{N(t) = 25\sqrt{e} \cdot t\, e^{-\frac{1}{72}t^2}}$$

$f_k(x) = \frac{x(2x+k)}{x^2+k}$ $\quad k \in \mathbb{R}$

$x^2 + k \neq 0$ $\quad k > 0$

$x^2 \neq -k$ $\quad k < 0$

$k > 0$
$\text{Dom} f = \mathbb{R}$
$k < 0$
$\text{Dom} f = \mathbb{R} \setminus \{\pm\sqrt{-k}\}$
$k = 0$
$\text{Dom} f = \mathbb{R} \setminus \{0\}$

Dom f: se $k > 0$ $\forall x \in \mathbb{R}$; se $k < 0$ $x \neq \pm\sqrt{-k}$; se $k = 0$ $x \neq 0$

$(x, f_k(x)) = (0;0)$ $\quad \boxed{0 = \frac{0}{k}}$ $\quad$ se $k \neq 0$

per $k \neq 0$ $f_k(x)$ passa per l'ORIGINE

$(0,0)$ $\quad f'_k(x) = \frac{[1\cdot(2x+k) + x\cdot 2](x^2+k) - x(2x+k)\cdot 2x}{(x^2+k)^2}$

$f'_k(x) = \frac{[2x+k+2x](x^2+k) - 4x^2(2x+k)}{(x^2+k)^2}$

$m = f'_k(0) = \frac{k \cdot k}{k^2} = \frac{\cancel{k^2}}{\cancel{k^2}} = 1$ $\quad k \neq 0$

$\boxed{m = 1}$ $\quad A(0;0)$

$y - y_A = m(x - x_A)$

$\boxed{y = x}$

$$\begin{cases} y = \frac{x(2x+k)}{x^2+k} \\ y = x \end{cases}$$

$\frac{x(2x+k)}{x^2+k} = x$

$\frac{\cancel{x}(2x+k)}{\cancel{x^2+k}} = \frac{\cancel{x}(x^2+k)}{\cancel{x^2+k}}$ $\quad$ c.e. $x \neq 0$

$2x + \cancel{k} = x^2 + \cancel{k}$ $\quad\quad$ $x^2 + k \neq 0$, $x^2 \neq -k$

$x^2 - 2x = 0$ $\quad\quad x = 0$, $y = 0$ per $k \neq 0$

$x(x-2) = 0$

$x = 2$

$f_k(x) = \frac{2\cancel{(4+k)}}{\cancel{(4+k)}} = 2$ $\quad$ per $k \neq -4$

A $(2;2)$ $\quad k \neq -4 \quad k \neq 0$