Ric. 10/1/19

11.6.3

$x = 29.5 \pm 0.61$

$y = 5.4 \pm 0.25$ $\rightarrow$ $x/y = ?$

$\Delta x = 0.61$

$\Delta y = 0.25$

$\varepsilon_x = \Delta x / x = 0.61/29.5$ ...

$\varepsilon_y = \Delta y / y = 5.4/0.25$ +

...

$x/y = 25.5/5.4$

$\varepsilon(x/y) = \varepsilon_x + \varepsilon_y =$

$\Delta(x/y) = \varepsilon(x/y) \cdot x/y = \ldots$

11.3.12

$$3\sin^2(x) = \sin(x) + 4$$

$t = \sin(x)$

$$3t^2 - t - 4 = 0$$

$$t_{1,2} = \frac{1 \pm \sqrt{1+48}}{6} = \frac{1 \pm 7}{6} = \begin{cases} -1 \\ 4/3 \end{cases}$$

$$\left(3t^2 - t - 4 = (t+1)(3t-4) \right)$$

$t = -1 \longrightarrow \sin(x) = -1 \rightarrow x = -\frac{\pi}{2} + 2k\pi$

$t = 4/3 \longrightarrow \sin(x) = 4/3 \longrightarrow \emptyset$

11.12.9

$f : \mathbb{R} \to \mathbb{R}$

$g(x) = 3 f(2x-1) - 5$

G_f contine $(3,1) \Rightarrow G_g$ contine ... ?

$f(3) = 1$

dupa ce $2x-1 = 3$ h. $f(2x-1) = 1$

$\Rightarrow$ pt $x = 2$ h. $f(2x-1) = 1$

$\Rightarrow g(2) = 3 \cdot 1 - 5 = -2$

$\Rightarrow G_g$ contine $(2, -2)$

11.12.16

Pesco 3 carte da 52; p(2 di cuori)

$$p = \frac{13}{52}\cdot\frac{12}{51}\cdot\frac{39}{50} + \frac{13}{52}\cdot\frac{39}{51}\cdot\frac{12}{50} + \frac{39}{52}\cdot\frac{13}{51}\cdot\frac{12}{50}$$

$$= 3\cdot\frac{13}{52}\cdot\frac{12}{51}\cdot\frac{39}{50} = \dots$$

11.12.17

Urna con 7 rossi
4 blu

Estraggo due: so che sono stesso colore.
prob entrambe rosse?

$$p(RR \mid RR \circ BB) = \frac{p(RR)}{p(RR \circ BB)} = \frac{p(RR)}{p(RR) + p(BB)}$$

$$= \frac{\frac{7}{11} \cdot \frac{6}{10}}{\frac{7}{11} \cdot \frac{6}{10} + \frac{4}{11} \cdot \frac{3}{10}} = \frac{42}{42+12} = \dots$$

11.12.18

10 partite a tombola

prob. primo estratto multiplo di 7 esattamente tre volte

Ogni volta $p(\text{I mult. di } 7) = \frac{12}{90}$

$$p\left(\begin{array}{c}\text{I mult. di 7}\\ \text{tre volte su 10}\end{array}\right) = \binom{10}{3} \cdot \left(\frac{12}{90}\right)^3 \cdot \left(\frac{78}{90}\right)^7 = \dots$$

11.10.15

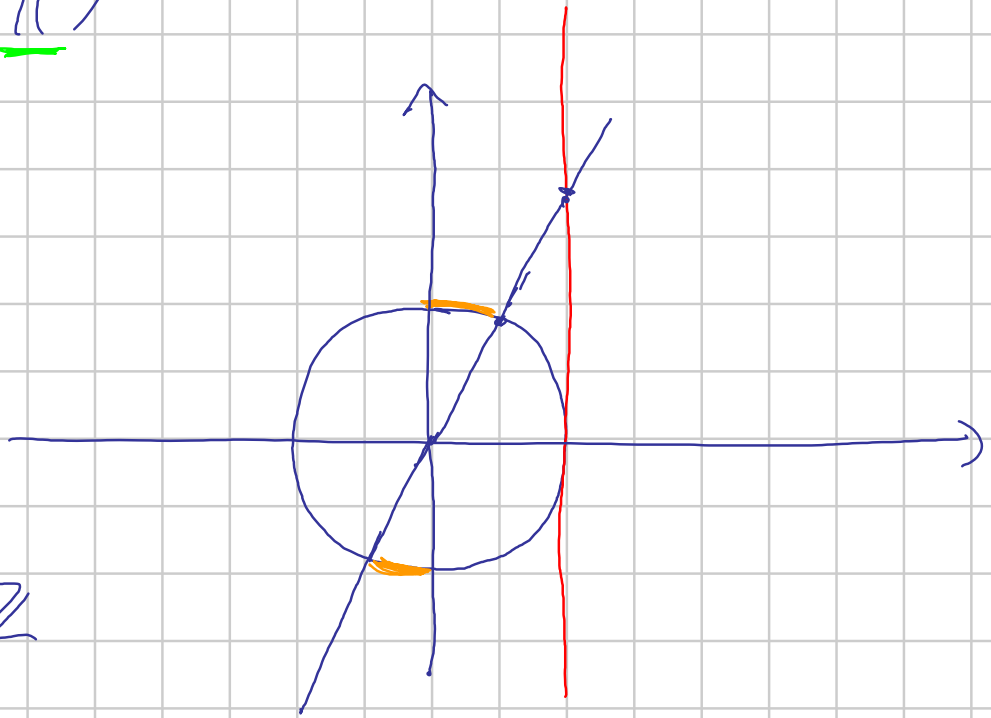
$$\begin{pmatrix} 2 \\ 5 \\ 1 \end{pmatrix} \wedge \begin{pmatrix} -1 \\ 3 \\ 2 \end{pmatrix} = \begin{pmatrix} 7 \\ -5 \\ 11 \end{pmatrix}$$

11.3.11 $\tan(x) \geq \sqrt{3}$

$$\tan(x) = \sqrt{3} = \frac{\sqrt{3}/2}{1/2}$$

$$x = \frac{\pi}{3} + k\pi$$

$$\frac{\pi}{3} + k\pi \leq x < \frac{\pi}{2} + k\pi \qquad k \in \mathbb{Z}$$



11.5.16

x	1.07	2.25	4.31
y	2.12	6.13	12.17

$y = mx + q$
approximare meglio

$$\mu(x) = \frac{1.07 + 2.25 + 4.31}{3} \qquad \mu(y) = - - -$$

$$\sigma^2(x) = \left((\mu(x) - 1.07)^2 + (\mu(x) - 2.25)^2 + (\mu(x) - 4.31)^2 \right) \frac{1}{3}$$

$$\sigma^2(y) = - - -$$

$$\sigma(x,y) = \frac{1}{3}\left((\mu(x) - 1.07)\cdot(\mu(y) - 2.12) + (- - -)\cdot(\ ) + (\ )\cdot(\ ) \right)$$

$$\left(\rho(x,y) = \frac{\sigma(x,y)}{\sigma(x)\,\sigma(y)} \right)$$

$$m = \frac{\sigma(x,y)}{\sigma(x)^2} \qquad q = m \cdot \mu(x) - \mu(y)$$

11.3.17 Seppiamo a roulette esito pari; prob > 13 = ...

$$p = \frac{12}{18}$$

11.3.18 Prob. di 3 successi ripetendo 8 volte esperimento con prob. $\frac{3}{5}$ di successo singolo.

Se ho esperimento con prob. u di successo, lo ripeto n volte, prob. di k successi è

$$\binom{n}{k} \cdot u^k \cdot (1-u)^{n-k}$$

$$\binom{8}{3} \cdot \left(\frac{3}{5}\right)^3 \cdot \left(\frac{2}{5}\right)^5 = \frac{8 \cdot 7 \cdot 6}{3 \cdot 2 \cdot 1} \cdot \frac{27 \cdot 32}{5.625} = \dots$$

11.7.18

20% maschi alti > 180 cm

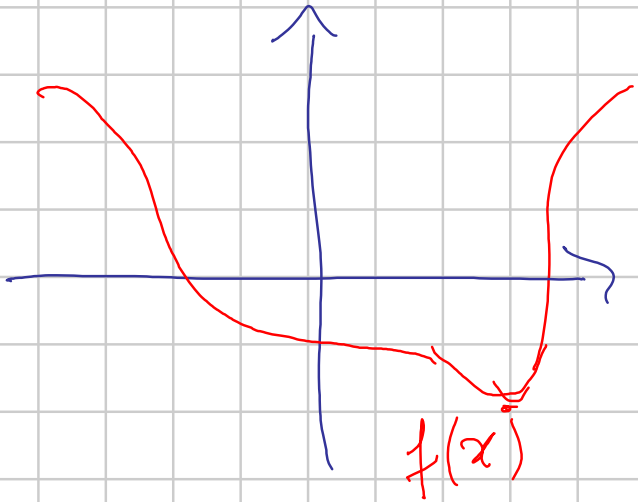
scelgo 8 a caso; prob 5 alti > 180 cm

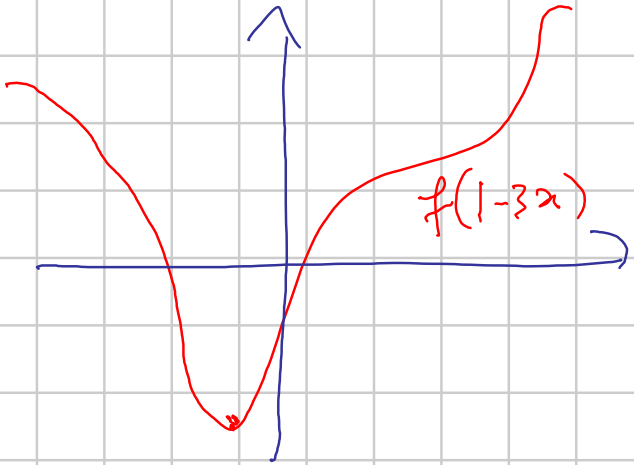
$$\binom{8}{5} \cdot \left(\frac{1}{5}\right)^5 \cdot \left(\frac{4}{5}\right)^3$$

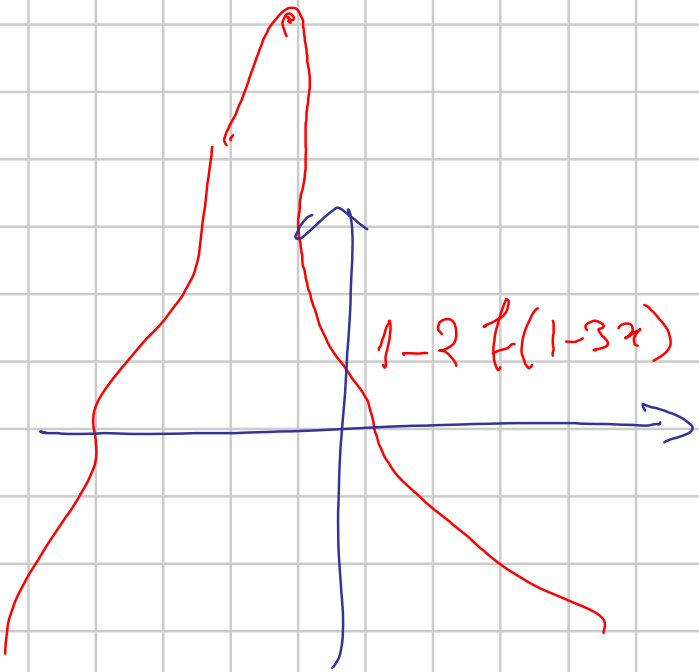
11.4.13

$f : \mathbb{R} \to \mathbb{R}$ min ass -3 in $x = 5$

$g(x) = 1 - 2 f(1-3x)$







quello che era min ora è max

per $x = 5$ f ha min -3

$\Rightarrow$ pt $1-3x=5$ ho $f(1-3x)=-3$

$\Rightarrow$ pt $x=-\frac{4}{3}$ ho $g(x)=1-2f(1-3x)$

$=1-2\cdot(-3)=7$ che è max

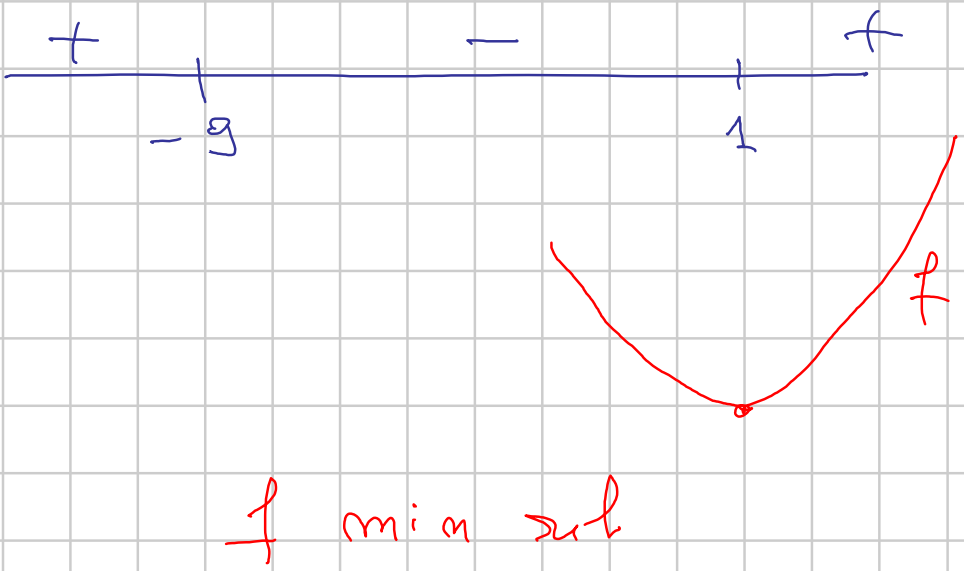
11.14.13 $f(x)=\dfrac{2x^2-3x+6}{x+4}$ in $x=1$

$$f'(x)=\frac{(4x-3)(x+4)-1\cdot(2x^2-3x+6)}{(x+4)^2}=$$

$$=\frac{1}{(x+4)^2}\cdot\begin{array}{r}4x^2+16x\\-3x-12\\-2x^2+3x-6\end{array}=\frac{1}{(\cdot)^2}-2x^2+16x-18$$

$$= \frac{2}{(x+4)^2} \cdot (x^2+8x-9)$$

$$= \frac{2}{(x+4)^2} \cdot (x+9)(x-1)$$



f min rel

$\lim_{x \to -\infty} f(x) = -\infty \Rightarrow$ il min rel. non è ass.