Monotonia

PASSED

studiare la monotonia delle seguenti funzioni

1	$y = 2x^2 - 4x + 3$	$x < 1$ *decrescente* $x > 1$ *crescente*
2	$y = 3x^2 - 5x + \frac{1}{3}$	$x < \frac{5}{6}$ *decrescente* $x > \frac{5}{6}$ *crescente*
3	$y = 3x^3 - 9x$	$x < -1 \vee x > 1$ *crescente* $-1 < x < 1$ *decrescente*
4	$y = x^3 - 3x^2 + 3x + 8$	$\forall x \in Dominio$ *crescente*
5	$y = 2x^3 - 9x^2 + 12x - 5$	$x < 1 \vee x > 2$ *crescente* $1 < x < 2$ *decrescente*
6	$y = \frac{1}{6}x^6 - \frac{4}{5}x^5 - \frac{1}{4}x^4 + \frac{4}{3}x^3 + 12$	$x < -1 \vee 1 < x < 4$ *decrescente* $-1 < x < 1 \vee x > 4$ *crescente*
7	$y = 16\,x^4 - 4x^2$	$x < -\frac{\sqrt{2}}{4} \vee 0 < x < \frac{\sqrt{2}}{4}$ *decrescente* $-\frac{\sqrt{2}}{4} < x < 0 \vee x > \frac{\sqrt{2}}{4}$ *crescente*
8	$y = \frac{2}{6}x^3 + 4x^2 + 8x - 2$	$x < -4 - 2\sqrt{2} \vee x > -4 + 2\sqrt{2}$ *crescente* $-4 - 2\sqrt{2} < x < -4 + 2\sqrt{2}$ *decrescente*

9	$y=(x-1)^3(2-x)$	$x<\frac{7}{4}$ *crescente* $x>\frac{7}{4}$ *decrescente*
10	$y=\frac{1}{1+x^2}$	$x<0$ *crescente* $x>0$ *decrescente*
11	$y=\frac{1}{x^2-3x+2}$	$x<1 \vee 1<x<\frac{3}{2}$ *crescente* $\frac{3}{2}<x<2 \vee x>2$ *decrescente*
12	$y=\frac{x-1}{x^2-x-6}$	$\forall x \in Dominio$ *decrescente*
13	$y=\frac{x}{x^2-9}$	$\forall x \in Dominio$ *decrescente*
14	$y=\frac{x^2}{1-x}$	$0<x \vee x>2$ *decrescente* $0<x<2$ *crescente*
15	$y=\frac{4-x^2}{2x+5}$	$x<-4 \vee x>1$ *decrescente* $-4<x<-\frac{5}{2} \vee -\frac{5}{2}<x<-1$ *crescente*
16	$y=\frac{2x-1}{(x-1)^2}$	$x<0 \vee x>1$ *decrescente* $0<x<1$ *crescente*
17	$y=\frac{2x-1}{x^2+11x-12}$	$\forall x \in Dominio$ *decrescente*

18	$y = \frac{x}{x^3 - 16}$	$x < -2$ *crescente* $-2 < x < \sqrt[3]{16} \vee x > \sqrt[3]{16}$ *decrescente*
19	$y = \frac{x^2 - x + 1}{x^2 + 3x + 6}$	$x < \frac{-5-\sqrt{61}}{4} \vee x > \frac{-5+\sqrt{61}}{4}$ *crescente* $\frac{-5-\sqrt{61}}{4} < x < \frac{-5+\sqrt{61}}{4}$ *decrescente*
20	$y = \frac{\sqrt{5 - x^2}}{3x + 6}$	$\forall x \in Dominio$ *decrescente*
21	$y = \sqrt{x - 1}$	$\forall x \in Dominio$ *crescente*
22	$y = \sqrt{x^2 + 2x + 2}$	$x < -1$ *decrescente* $x > -1$ *crescente*
23	$y = (x + 1)^{\frac{1}{3}}$	$x > -1$ *crescente*

24	$y = [(x-1)(x-2)^2]^{\frac{1}{3}}$	$x < \frac{4}{3} \vee x > 2$ *crescente* $\frac{4}{3} < x < 2$ *decrescente*
25	$y = \frac{2}{\sqrt{x}} - \sqrt{x}$	$\forall x \in$ *Dominio decrescente*
26	$y = x^3 e^3$	$\forall x \in$ *Dominio crescente*
27	$y = \frac{e^{x+3}}{x-2}$	$x < 2 \vee 2 < x < 3$ *decrescente* $x > 3$ *crescente*
28	$y = e^{\frac{x^2-2x+1}{x+1}}$	$x < -3 \vee x > 1$ *crescente* $-3 < x < 1$ *decrescente*
29	$y = (x-1)\, e^{-x^2}$	$x < \frac{1-\sqrt{3}}{2} \vee x > \frac{1+\sqrt{3}}{2}$ *decrescente* $\frac{1-\sqrt{3}}{2} < x < \frac{1+\sqrt{3}}{2}$ *crescente*
30	$y = e^{-x} - e^{-3x}$	$x < \frac{\ln 3}{2}$ *crescente* $x > \frac{\ln 3}{2}$ *decrescente*
31	$y = e^{\sqrt{\frac{x-2}{3-x}}}$	$\forall x \in$ *Dominio crescente*

32	$y = e^{(x^2+3)^{\frac{1}{2}}+x}$	$\forall x \in Dominio \ \ crescente$
33	$y = 2x + 4\,ln\,x$	$\forall x \in Dominio \ \ crescente$
34	$y = 2\,ln\,x + ln^2 x$	$0 < x < \frac{1}{e} \ \ decrescente$ $x > \frac{1}{e} \ \ crescente$
35	$y = ln(x^2 + 1)$	$x < 0 \ \ decrescente$ $x > 0 \ \ crescente$
36	$y = ln\sqrt{1 - x^2}$	$-1 < x < 0 \ \ crescente$ $0 < x < 1 \ \ decrescente$
37	$y = x\,ln\,x$	$0 < x < e^{-1} \ \ decrescente$ $x > e^{-1} \ \ crescente$
38	$y = ln\left(\frac{2x+6}{x-5}\right)$	$\forall x \in Dominio \ \ decrescente$
39	$y = ln(2x^2 - 10x + 12)$	$x < 2 \ \ decrescente$ $x > 3 \ \ crescente$

40	$y = ln\left(\frac{x-5}{x+3}\right)$	$\forall x \in Dominio \ \ decrescente$
41	$y = ln\sqrt{x^2-4}$	$x < -2 \ \ decrescente$ $x > 2 \ \ crescente$
42	$y = 3lnx + ln^2x$	$0 < x < e^{-\frac{3}{2}} \ \ decrescente$ $x > e^{-\frac{3}{2}} \ \ crescente$
43	$y = 2x + 4sinx \qquad [0,\pi]$	$2k\pi < x < \frac{2}{3}\pi + 2k\pi \ \vee \ \frac{4}{3} + 2k\pi < x < 2\pi + 2k\pi \ \ crescente$ $\frac{2}{3}\pi + 2k\pi < x < \frac{4}{3} + 2k\pi \ \ decrescente$
44	$y = 3\,tan\,x - 1$	$\forall x \in Dominio \ \ crescente$
45	$y = sin\,x + x$	$\forall x \in Dominio \ \ crescente$
46	$y = cos\,x + sin\,x \qquad [0,\pi]$	$0 < x < \frac{\pi}{4} \ \vee \ \frac{5}{4}\pi < x < 2\pi \ \ crescente$ $\frac{\pi}{4} < x < \frac{5}{4}\pi \ \ decrescente$
47	$y = 4\,cos\,x\,sin\,x$	$-\frac{\pi}{4} + k\pi < x < \frac{\pi}{4} + k\pi \ crescente$ $\frac{\pi}{4} + k\pi < x < \frac{3}{4}\pi + k\pi \ decrescente$
48	$y = 2\,sin\,x\,cos\,x$	$-\frac{\pi}{4} + k\pi < x < \frac{\pi}{4} + k\pi \ crescente$ $\frac{\pi}{4} + k\pi < x < \frac{3}{4}\pi + k\pi \ decrescente$

49	$y = tan^{-1}(x)\left(-\frac{1}{x}\right)$	$x < 0 \in Dominio\ decrescente$ $x > 0 \in Dominio\ crescente$
50	$y = \frac{\sin x}{1 - \cos x}$ $[0, \pi]$	$\forall x \in Dominio\ decrescente$
51	$y = 4x - \lvert 14x^2 - 6x \rvert$	$x < 0 \vee \frac{1}{14} < x < \frac{3}{7}$ *crescente* $0 < x < \frac{1}{14} \vee x > \frac{3}{7}$ *decrescente*
52	$y = \frac{x^2}{1 - 3x - x\lvert x \rvert}$	$x < 0 \vee x > \frac{2}{3}$ *decrescente* $0 < x < \frac{-3+\sqrt{13}}{2} \vee \frac{-3+\sqrt{13}}{2} < x < \frac{2}{3}$ *crescente*
53	$y = \left\lvert \frac{2x^2 - 6x}{2x + 4} \right\rvert$	$x < -2 - \sqrt{10} \vee -2 < x < 0 \vee -2 + \sqrt{10} < x < 3$ *decrescente* $-2 - \sqrt{10} < x < -2 \vee 0 < x < -2 + \sqrt{10} \vee x < 3$ *crescente*
54	$y = \lvert x \rvert\, e^x$	$x < -1 \vee x > 0$ *crescente* $-1 < x < 0$ *decrescente*
55	$y = e^{-x^2 + \lvert x-2 \rvert}$	$x < -\frac{1}{2}$ *crescente* $-\frac{1}{2} < x < 2 \vee x > 2$ decrescente
56	$y = \frac{x^2}{ln\lvert x \rvert - 1}$ $[0, +\infty]$	$0 < x < e \vee e < x < e^{\frac{3}{2}}$ *decrescente* $x > e^{\frac{3}{2}}$ *crescente*
57	$y = \lvert x + 1 \rvert\, e^{-\frac{1}{(x+1)^2}}$	$x < -1$ *decrescente* $x > -1$ *crescente*
58	$y = x^x$	$0 < x < e^{-1}$ *decrescente* $x > e^{-1}$ *crescente*