Determina il campo di esistenza delle seguenti funzioni algebriche

1. $y = \dfrac{x^2+1}{x^2+6x-7}$ $]-\infty; -7[\;\cup\;]-7; 1[\;\cup\;]1; +\infty[$

2. $y = \sqrt{10x - x^2}$ $[0; 10]$

3. $y = \dfrac{1}{3x^2+3x} + \sqrt[3]{x}$ $]-\infty; -1[\;\cup\;]-1; 0[\;\cup\;]0; +\infty[$

4. $y = (1 + 5x - 6x^2)^{-\frac{1}{2}}$ $\left]-\dfrac{1}{6}; 1\right[$

5. $y = \dfrac{1}{\sqrt[3]{x^4-4x^2+3}}$ $]-\infty; -\sqrt{3}[\;\cup\;]-\sqrt{3}; -1[\;\cup\;]-1; 1[\;\cup\;]1; \sqrt{3}[\;\cup\;]\sqrt{3}; +\infty[$

6. $y = \dfrac{1}{x^3+x^2+2x}$ $]-\infty; 0[\;\cup\;]0; +\infty[$

7. $y = \dfrac{x}{(2x+1)^2-(x-1)^2}$ $]-\infty; -2[\;\cup\;]-2; 0[\;\cup\;]0; +\infty[$

8. $y = \dfrac{x^2-1}{x^3+7x^2-8}$

9. $y = \sqrt{|x - 1| - 2}$

10. $y = \dfrac{\sqrt{3-|x|}}{x^3+1}$

11. $y = \dfrac{1}{\sqrt{2x-1}-\sqrt{x}}$ $\left[\dfrac{1}{2}; 1\right[\;\cup\;]1; +\infty[$

12. $y = \sqrt{x^2 + 5x - 6} + \sqrt{8 - x^3}$ $]-\infty; -6]\;\cup\;[1; 2]$

13. $y = \sqrt{\dfrac{x^2-4}{x+3}}$ $]-3; -2]\;\cup\;[2; +\infty[$

14. $y = \sqrt{\dfrac{x^2-1}{x+2}} + \sqrt{\dfrac{x-2}{x+1}}$ $]-2; -1[\;\cup\;[2; +\infty[$

15. $y = \sqrt{5 - x} + \sqrt{x^2 - 4}$ $]-\infty; -2]\;\cup\;[2; 5]$

16. $y = \sqrt{\dfrac{x-3}{4-|x|}}$ $]-\infty; -4[\;\cup\;[3; 4[$

17. $y = \sqrt{\dfrac{9-x^2}{\sqrt[3]{x}}} + \dfrac{\sqrt[3]{x^2-2x}}{\sqrt{|2x-1|-3}}$ $]-\infty; -3]\;\cup\;]2; 3]$

Determina il campo di esistenza delle seguenti funzioni trascendenti contenenti funzioni esponenziali e/o logaritmiche

18. $y = \sqrt{e^{2x} - e^{3x}}$ $x \leq 0$

19. $y = (x - 1)e^{-x}$ R

20. $y = \log(\log x - 1)$ $x > 10$

21. $y = \sqrt{\ln(x + 2)}$ $x \geq -1$

22. $y = \ln(x^2 - 4) + \sqrt{25 - x^2}$ $-5 \leq x \leq -2 \cup 2 < x \leq 5$

23. $y = \sqrt{2^{x^2 - 1} - 8}$ $x \leq -2 \cup x \geq 2$

24. $y = \sqrt{\ln(4 - x) - 2\ln(x - 2)}$ $2 < x \leq 3$

25. $y = \ln\left(\frac{e^x - \sqrt{e^{x+1}}}{x - 2}\right)$ $x < 1 \cup x > 2$

26. $y = \sqrt{2 - \log_{\frac{1}{2}} x} + \ln(3 - \log_2 x)$ $1/4 \leq x < 8$

27. $y = \sqrt{(\log_2 x)^2 - \log_2 x^4 + 3}$ $0 < x \leq 2 \cup x \geq 8$

28. $y = \sqrt{e^x} + \ln|2x^2 + x - 3|$ $x \neq -\frac{3}{2}; x \neq 1$

29. $y = \ln\left(\frac{x^4 - 81}{x^2 + 2x}\right)$

30. $y = \frac{\ln|e^x - 1|}{e^{x^2 + 4x - 5} - 1}$ $x \neq -5; x \neq 0; x \neq 1$

31. $y = \ln(\ln^2 x^2 - 1) + \sqrt{x}$

32. $y = \ln\left(e^x - \frac{1}{e^{x+1}}\right)$ $x > -\frac{1}{2}$

33. $y = \sqrt{\frac{1}{e^{-x}} - e^{\frac{1}{x}}}$ $-1 \leq x < 0 \cup x \geq 1$

34. $y = e^{\frac{x+1}{x^3 - 2x^2 - x + 2}}$ $x \neq -1; x \neq 1; x \neq 2$

35. $y = \sqrt{2^{x+1} - \sqrt{\frac{1}{2^x}} + \log_2(3 - \log_2 x)}$ $-5 < x < -1 \cup 1/3 < x < 1$

Determina il campo di esistenza delle seguenti funzioni di vario tipo

36. $\sqrt{\frac{x+2}{x+5}}$ $x < -5 \cup x \geq -2$

37. $\frac{\sqrt{x+2}}{\sqrt{x+5}}$ $x \geq -2$

38. $\log_2(2x + 3) - \log_2(5x - 10)$ $-\frac{3}{2} < x < 2$

39. $y = \frac{\sqrt{x+2}}{\sqrt[3]{x+5}}$ $x \geq -2$

40. $y = \sqrt[3]{\frac{x+2}{x+5}}$ $x \neq -5$

41. $y = \frac{\sqrt[3]{x+2}}{\sqrt{x+5}}$ $x > -5$

42. $y = \frac{1}{25^x - 125}$ $x \neq \frac{3}{2}$

43. $y = \frac{1}{3 - \ln x} + \frac{1}{4 - 8^x}$

44. $y = \sqrt{\log_{\frac{1}{2}}(x - 2)}$ $2 < x \leq 3$

45. $y = \frac{1}{\ln(x^2 + x + 1)}$

46. $y = \sqrt{\frac{x^2 + 5x - 6}{x}}$

47. $y = \sqrt{2x^2 - 18} + \sqrt{7 - x}$ $x \leq -3 \cup 3 \leq x \leq 7$

48. $y = \frac{\sqrt{5x - x^2}}{x - 3}$ $0 \leq x \leq 5 \cup x \neq 3$

49. $y = \ln\left(\frac{x^2 - 5x - 6}{x^2 + 1}\right)$ $x < -1 \cup x > 6$

50. $y = \frac{\sqrt{5^x - 25}}{3^x - 1}$ $x \geq 2$

Ulteriori esercizi

1. $y = \frac{3x-1}{x+2}$

2. $y = \sqrt{\frac{2x^2-3x+2}{2x^2-7x+3}}$

3. $y = \sqrt{log(x-3)}$

4. $y = \sqrt{x^2-9} + log(16-x^2) + \frac{1}{x^2}$

5. $y = \sqrt{log\left(\frac{6x+1}{2}\right)} - \sqrt{x^2-4} + e^x - 3^{\sqrt{x+2}}$

6. $y = \sqrt{\frac{|x^2-3|+2x}{|x|}}$

7. $y = \sqrt{\frac{2sinx-\sqrt{2}}{2sinx-1}}$

8. $y = \sqrt{\frac{log(x^2-3x+3)}{logx}}$

9. $y = \sqrt{3ln^2x - 7lnx + 4}$ $\qquad\qquad]0;e[\cup \left[e^{\frac{4}{3}};+\infty\right[$

10. $y = \sqrt{\frac{log_3|x-3|+1}{log_3|x^2-3|}}$ $\qquad]-\infty;-2[\cup]-\sqrt{2};\sqrt{2}[\cup]2;8/3] \cup \left[\frac{10}{3};+\infty\right[$

11. $y = e^{\sqrt[3]{\frac{x^2-2x+1}{x-1}}}$ $\qquad\qquad]-\infty;1[\cup]1;+\infty[$

12. $y = e^{\sqrt{\frac{sinx}{2cosx-1}}}$ $\qquad\qquad \left[0+2k\pi;\frac{\pi}{3}+2k\pi;\right[\cup \left[\pi+2k\pi;\frac{5}{3}+2k\pi\right[$

13. $y = arcsin\left(\frac{x^2-1}{4x-4}\right)$ $\qquad\qquad [-5;1[\cup]1;3]$

14. $y = \left(\frac{3arcsinx+\pi}{4arcsinx-3\pi}\right)^{\sqrt{ln(x^2-3x+3)}}$ $\qquad \left[-\frac{\sqrt{3}}{2};-\frac{\sqrt{2}}{2}\right[$

15. $y = \sqrt{\frac{ln(x+1)}{ln|x|}}$ $\qquad\qquad]-1;0[\cup]1;+\infty[$

16. $y = \dfrac{ln(1-x^2)}{\sqrt{x-x^2}}$ $]0; 1[$

17. $y = \sqrt{ln(|x^2 - x| - 1)}$ $]-\infty; -1] \cup [2; +\infty[$

18. $y = \sqrt{\log_{\frac{1}{2}}(x^2 + 4) + 2}$ $\{0\}$

19. $y = \sqrt{ln(|x| + |x + 1|)}$ R

20. $y = ln(e^x - 1)$ $]0; +\infty[$

21. $y = \sqrt{\dfrac{lnx^2 - 2}{ln(x+1)}}$ $]-1; 0[\cup [e; +\infty[$

22. $y = e^{\sqrt{3x^2 + 6x - 3}}$ $]-\infty; -\sqrt{2} - 1[\cup [\sqrt{2} - 1; +\infty[$

23. $y = \sqrt{\dfrac{e^x - 1}{e^x + 1}}$ $[0; +\infty[$

24. $y = \sqrt{\pi - arcsinx}$ $[-1; 1]$

25. $y = ln\left(\dfrac{x^2 - 3x}{x+1}\right)$ $]-1; 0[\cup]3; +\infty[$

26. $y = \sqrt{\log_2(x - 2) - \log_4 x} + \sqrt{3\log_8 x - 4}$ $[16; +\infty[$

27. $y = \log_2 \dfrac{3 - 2x}{ln|x - 2|}$

28. $y = \dfrac{\sqrt{x^3 - 2x^2 - 5x + 6}}{3x^2 - x}$

29. $y = \dfrac{\sqrt{ln(x-2) + ln(x+5) - ln(x^2 - 7x)}}{\sqrt{8} - 2^{x-6}}$ $]-\infty; 7[\cup]7; \frac{15}{2}[\cup]\frac{15}{2}; +\infty[$

30. $y = \dfrac{\sqrt{2x + 3} - \sqrt{x - 1} + ln(\sqrt{x^2 + 1} - 2x)}{ln(4 - x)}$ $]1; 3[\cup]3; 4[$

31. $y = \log_x(2x^2 - x)$ $]\frac{1}{2}; 1[\cup]1; +\infty[$

32. $y = lnlnln(x - 1)$

33. $y = \dfrac{ln(4^x - 4 \cdot 2^x - 32)}{\sqrt{4^x + 8} - \sqrt{32 - 2 \cdot 2^x}}$ $]3; 4]$

34. $y = \sqrt{\log_2 \dfrac{x-1}{x-3} - 1}$ $]3; 5]$

5

35. $y = \dfrac{\sqrt{x-2}}{\ln\ln x}$ $[2; e[\, \cup \,]e; +\infty[$

36. $\sqrt{\dfrac{x-5}{3x^2-5x-2}}$ $\left]-\dfrac{1}{3}; 2\right[\, \cup \, [5; +\infty[$

37. $y = \sqrt{x+7} - \sqrt{4x-3}$ $\left[\dfrac{3}{4}; +\infty\right[$

38. $y = \sqrt{e^{\frac{x-1}{x}} - 1}$ $]-\infty; 0] \, \cup \, [1; +\infty[$

39. $y = \dfrac{e^{\sqrt{1-x^2}}}{|x|}$ $[-1; 0[\, \cup \,]0; 1]$

40. $y = \sqrt{\ln \dfrac{3-x}{1-x^2}}$ $]-1; 1[$

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