Calcula los siguientes límites

1. $\displaystyle\lim_{x\to\frac{1}{2}}\frac{x^2-5x+2}{x^2+3x-3}$ $\displaystyle\frac{1}{5}$

2. $\displaystyle\lim_{x\to4}\frac{2x^2-7x-4}{x^3+x^2-10}$ 0

3. $\displaystyle\lim_{x\to3^+}\frac{x+2}{x^2-4x+3}$ $+\infty$

4. $\displaystyle\lim_{x\to3^-}\frac{x+2}{x^2-4x+3}$ $-\infty$

5. $\displaystyle\lim_{x\to3}\frac{x+2}{x^2-4x+3}$ No existe $(^1)$

6. $\displaystyle\lim_{x\to3}\frac{x^2+5}{x^2-6x+9}$ $+\infty.(^2)$

7. $\displaystyle\lim_{x\to-1}\frac{x+1}{x^3+3x^2+3x+1}$ $+\infty$

8. $\displaystyle\lim_{x\to-2}\frac{x^2+4x+4}{x^3+6x^2+12x+8}$. No existe
   Ayuda:$\begin{cases} x^2+4x+4=(x+2)^2 \\ x^3+6x^2+12x+8=(x+2)^3 \end{cases}$

9. $\displaystyle\lim_{x\to3}\sqrt{\frac{x^3-2x+5}{4x^2-x+2}}$ $\displaystyle\sqrt{\frac{26}{35}}$

10. $\displaystyle\lim_{x\to5}\frac{x^2-25}{10-2x}$ -5

11. $\displaystyle\lim_{x\to3}\frac{(x-1)(x-3)^3}{(2x+1)(2x-1)(x-3)^2}$ 0

12. $\displaystyle\lim_{x\to4}\frac{x^2-16}{\sqrt{2x+1}-3}$ 24

13. $\displaystyle\lim_{x\to1}\frac{\sqrt{x+1}-2}{\sqrt{2x+10}-\sqrt{5x+1}}$ $-\frac{1}{3}\sqrt{3}$

14. $\displaystyle\lim_{x\to3}\frac{\sqrt{x+1}-2}{\sqrt{2x+10}-\sqrt{5x+1}}$ $-\frac{2}{3}$

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^{1} $\displaystyle\lim_{x\to3^+}\frac{x+2}{x^2-4x+3}=+\infty$ y $\displaystyle\lim_{x\to3^-}\frac{x^2+5}{x^2-6x+9}=$ $-\infty$
^{2} $x^2-6x+9=(x-3)^2$

15. $\displaystyle\lim_{x\to -a}\frac{x^5+a^5}{x^4-a^4}$ $\qquad -\dfrac{5}{4}a$

16. $\displaystyle\lim_{h\to 0}\frac{(x+h)^4-x^4}{h}$ $\qquad 4x^3$

17. $\displaystyle\lim_{x\to 2}\frac{x^2-4}{x^3-2x^2+4x-8}$ $\qquad \dfrac{1}{2}$

18. $\displaystyle\lim_{x\to -2}\frac{2x^3+9x^2+12x+4}{3x^3+11x^2+8x-4}$ $\qquad \dfrac{3}{7}$

19. $\displaystyle\lim_{x\to 0}\frac{\sqrt{x+4}-2}{x}$ $\qquad \dfrac{1}{4}$

20. $\displaystyle\lim_{h\to 0}\frac{\sqrt{x+h}-\sqrt{x}}{h}$ $\qquad \dfrac{1}{2\sqrt{x}}$

21. $\displaystyle\lim_{x\to 1}\frac{\sqrt[3]{x^2-1}}{\sqrt[6]{x^3-3x+2}}$ $\qquad \sqrt[6]{\dfrac{4}{3}}$

22. $\displaystyle\lim_{x\to 5}\frac{2x-10}{\sqrt{x+4}-3}$ $\qquad 12$

23. $\displaystyle\lim_{x\to 2}\frac{x^2+2x-8}{x^3-6x^2+11x-6}$ $\qquad -6$

24. $\displaystyle\lim_{x\to 0}\frac{x^2-x}{5x^2+3x}$ $\qquad -\dfrac{1}{3}$

25. $\displaystyle\lim_{x\to 2}\frac{x^3-4x^2+4x}{x^3-3x^2+4}$ $\qquad \dfrac{2}{3}$

26. $\displaystyle\lim_{x\to 2}\left[\frac{x^2-13x+22}{x^2-8x+12}\right]^{\frac{x-1}{2}}$ $\qquad \dfrac{3}{2}$

27. $\displaystyle\lim_{x\to 3}\frac{\sqrt{\frac{x}{3}}-1}{x-3}$ $\qquad \dfrac{1}{6}$

28. $\displaystyle\lim_{x\to 3}\frac{x-\sqrt{6+x}}{x-3}$ $\qquad \dfrac{5}{6}$

29. $\displaystyle\lim_{x\to -1}\frac{x^4-1}{x^3+1}$ $\qquad -\dfrac{4}{3}$

30. $\displaystyle\lim_{x\to 1}\frac{x^2+x-2}{\sqrt{x+3}-2}$ $\qquad 12$

31. $\displaystyle\lim_{x\to 3}e^{\frac{2x-4}{x^2-4}}$ $\qquad \sqrt{e}$