

**AB Calculus**  
**Section 2.1 Day 2 - Solving Limits Algebraically**

Find the limit

1. $\lim_{x \rightarrow 2} x^3 + 6x^2 - 16$ 0	2. $\lim_{x \rightarrow 0} \pi^2$ $\pi^2$	3. $\lim_{x \rightarrow 4} \frac{x^2 + 9}{x^2 - 1}$ $\frac{5}{3}$
4. $\lim_{x \rightarrow 4} \frac{x^2 - 16}{x^2 + x - 20}$ $\frac{8}{9}$	5. $\lim_{x \rightarrow 0} \frac{x^2 + 2x}{x - 2x^2}$ 0	6. $\lim_{x \rightarrow 1} \frac{1 - x^2}{x^2 + 5x - 6}$ $-\frac{2}{7}$
7. $\lim_{x \rightarrow 1} \frac{x^2 + x - 2}{x^2 - 4x + 3}$ $-\frac{3}{2}$	8. $\lim_{x \rightarrow a} \frac{x^2 - a^2}{x - a}$ $2a$	9. $\lim_{x \rightarrow 3} \frac{x^3 - 27}{x - 3}$ 27
10. $\lim_{x \rightarrow 1} \frac{x^3 - 3x^2 + 2x}{x - 1}$ -1	11. $\lim_{h \rightarrow 2} \frac{h^3 - 4h}{h^3 - 2h^2}$ 2	12. $\lim_{x \rightarrow a} \frac{\frac{1}{x} - \frac{1}{a}}{x - a}$ $-\frac{1}{2a}$
13. $\lim_{h \rightarrow 0} \frac{\frac{1}{3+h} - \frac{1}{3}}{h}$ $-\frac{1}{9}$	14. $\lim_{x \rightarrow a} \frac{x^3 + a^3}{x + a}$ $3a^2$	15. $\lim_{x \rightarrow 3} \frac{x - 3}{x^3 - 27}$ $\frac{1}{27}$
16. $\lim_{x \rightarrow 2} \frac{1 - \frac{4}{x^2}}{1 - \frac{2}{x}}$ 2	17. $\lim_{h \rightarrow 1} \frac{ h - 2  - 2}{h}$ -1	18. $\lim_{x \rightarrow 4} \frac{x - 4}{ x - 4 }$ -1
19. $\lim_{x \rightarrow 1^-} \frac{x - 1}{ x - 1 }$ 1	20. $\lim_{x \rightarrow 6} 10$ 10	21. $\lim_{x \rightarrow 5} \frac{3x}{ x }$ 3
22. $\lim_{x \rightarrow 10^-} \frac{ x - 10 }{x - 10}$ -1	23. $\lim_{x \rightarrow 10^+} \frac{ x - 10 }{x - 10}$ 1	24. $\lim_{x \rightarrow 10} \frac{ x - 10 }{x - 10}$ DNE
25. $\lim_{x \rightarrow 7} \frac{x^2 - 49}{x - 7}$ 14	26. $\lim_{x \rightarrow 9} \frac{x^2 - 81}{x - 9}$ 18	

27. Find  $\lim_{x \rightarrow 1} f(x)$  where  $f(x) = \begin{cases} \frac{1}{x+2}, & x < 1 \\ 1 - 2x, & x > 1 \end{cases}$  DNE

28. Find the right hand limit at  $x = 1$  for  $f(x) = \begin{cases} 1 - x, & x > 1 \\ 6, & x = 1 \\ 1 + x, & x < 1 \end{cases}$  0

29. Find the left hand limit at  $x = 0$  for  $f(x) = \begin{cases} x^3 - 1, & x \geq 0 \\ x + 1, & x < 0 \end{cases}$  1