

HW2: Limits Algebraically

Find the following limits:

1. $\lim_{x \rightarrow 2} (x^2 - x + 1)$ 2. $\lim_{x \rightarrow 1} \left(\frac{2x+1}{3x-2} \right)$ 3. $\lim_{x \rightarrow 1} \sqrt{10x-1}$

4. $\lim_{x \rightarrow 1} \left(\frac{x^2 - x - 2}{x - 2} \right)$ 5. $\lim_{x \rightarrow 2} \left(\frac{x^2 - x - 2}{x - 2} \right)$ 6. $\lim_{x \rightarrow 4} \left(\frac{\sqrt{x} - 2}{x - 4} \right)$

7. $\lim_{x \rightarrow -3} \left(\frac{x^2 - 9}{x + 3} \right)$ 8. $\lim_{x \rightarrow -3} \left(\frac{x^2 - 9}{2x^2 + 7x + 3} \right)$ 9. $\lim_{x \rightarrow 9} \left(\frac{\sqrt{x} - 3}{x - 9} \right)$

10. $\lim_{h \rightarrow 0} \left(\frac{(1+h)^2 - 1^2}{h} \right)$ 11. $\lim_{h \rightarrow 0} \left(\frac{(3+h)^2 - 3^2}{h} \right)$ 12. $\lim_{h \rightarrow 0} \left(\frac{(x+h)^2 - x^2}{h} \right)$

For 13-20 use the piecewise function: $f(x) = \begin{cases} x+1, & x < 2 \\ x^2 - 2, & 2 < x < 4 \\ \sqrt{x+5}, & x \geq 4 \end{cases}$

13. $\lim_{x \rightarrow 1} f(x)$ 14. $\lim_{x \rightarrow 2} f(x)$ 15. $\lim_{x \rightarrow 3} f(x)$ 16. $\lim_{x \rightarrow 4} f(x)$

17. $f(1)$

18. $f(2)$

19. $f(3)$

20. $f(4)$