

HW: Evaluating Limits Analytically

Find each of the following limits analytically.

$$4. \lim_{x \rightarrow 3} \frac{x^3 - 27}{x - 3}$$

$$5. \lim_{x \rightarrow 5} \frac{x^2 - 5x}{x^2 - 25}$$

$$6. \lim_{x \rightarrow -1} \frac{x^{89} + 2x^{56} - 6x^{18} - 8x - 7}{x^{59} + 3x^{46} - 17x^{15} + 19}$$

$$7. \lim_{x \rightarrow 4} e$$

$$8. \lim_{x \rightarrow 1} \frac{(x-1)^4}{x^4 - 1}$$

$$9. \lim_{x \rightarrow 0} \frac{2 - \sqrt{4+x}}{x}$$

$$10. \lim_{x \rightarrow 0} \frac{3x^3 - 2x^2 + x - 7}{8x^3 + x^2 - 9x + 7}$$

$$11. \lim_{x \rightarrow 2} \frac{1 - \frac{2}{x}}{x^2 - 4}$$

For Exercises 14 - 19, find the limits if  $\lim_{x \rightarrow c} f(x) = 2$  and  $\lim_{x \rightarrow c} g(x) = -3$

$$14. \lim_{x \rightarrow c} \sqrt{2f(x) - 4g(x)}$$

$$15. \lim_{x \rightarrow c} [f(x) + 1]^3$$

$$16. \lim_{x \rightarrow c} \frac{2f(x) + 3g(x)}{g(x) - f(x)}$$

$$17. \lim_{x \rightarrow c} [f(x) \cdot 2g(x)]$$

$$18. \lim_{x \rightarrow c} [f(x) \cdot (g(x) + 3)]$$

$$19. \lim_{x \rightarrow c} \frac{f(x)^2}{1 - g(x)}$$