

Compute the limits.

1) $\lim_{x \rightarrow 5} 2x^2 - 4x + 20$

2) $\lim_{h \rightarrow 0} \frac{\sqrt{25+h} - \sqrt{25}}{h}$

3) $\lim_{x \rightarrow 1} \frac{x^2 - 4x + 3}{x - 1}$

4) $\lim_{x \rightarrow 2^+} \frac{1}{x^2 - 4}$

5) $\lim_{x \rightarrow 4^+} [5x]$

6) What is the average rate of change of $f(x) = 16x^2$ over the interval $[5, 5.1]$?

7) Redefine the following function to remove the discontinuity.

$$g(x) = \begin{cases} 3 & \text{if } x < 1 \\ 2 & \text{if } x = 1 \\ 4 - x & \text{if } x > 1 \end{cases}$$

8) How close to 6 must x be so that $f(x) = 5x$ is within 0.02 units of 30?

9) Find the slope of the curve $f(x) = x^2$ at the point $(5, 25)$ by computing the limit

$$\lim_{h \rightarrow 0} \frac{f(x+h) - f(x)}{h}$$

10) What is the equation of the tangent line to the curve $f(x) = x^2$ at the point $(-4, 16)$?