

M408C Practice Test 1

Please remember: We won't help you work these problems.

2. Sketch an example of a function $f(x)$ such that $f(3) = 3$ but $\lim_{x \rightarrow 3} f(x) = 5$.

3. Find $\lim_{x \rightarrow 4} \frac{x^2 - 16}{x^2 - 8x + 16}$.

4. Find $\lim_{x \rightarrow 9} \frac{\sqrt{x} - 3}{x - 9}$.

5. Find $\lim_{x \rightarrow 2^-} \frac{1}{2 - x}$.

6. Find $\lim_{x \rightarrow -3^+} \frac{(x + 2)|3 + x|}{3 + x}$.

In Problems 7 through 12, find y' .

7. $y = 6x^7 + 2\sqrt[3]{x} - \frac{3}{x^4} + 5$

8. $y = x^2 \cos(x)$

9. $y = \frac{x^3 + 1}{\sqrt{x} + 1}$

10. $y = \sec^5(x^5)$

12. $y = \sin(\sin(\sin(\sin(2x))))$

13. Find the equation of the tangent line to the curve $y = \cos(x)$ at the point where $x = \pi/3$.

15. The graph of $y = f(x)$ is shown. Sketch the graph of $y = f'(x)$.

16. Find y'' for each function in Problems 7–12.

17. Use the (limit) definition of derivative to find the derivative of $f(x) = 2x^3 - x + 5$.