

Problem 1

Find the following limits

1. $\lim_{x \rightarrow -\infty} \sqrt{4x^2 + 3x} + 2x$
2. $\lim_{x \rightarrow \infty} \sqrt{4x^2 + 3x} + 2x$

Problem 2

Find the equation of the line tangent to the curve at the given point of the following

1. $y = x^3 - 3x + 1$ at $x = 2$
2. $y = \frac{2x+1}{x+2}$ at $x = 0$

Problem 3

Evaluate the following derivatives:

1. $f(x) = 3x^2 - 4x + 1$
2. $f(t) = 2t^3 + t$
3. $f(t) = \frac{2t+1}{t+3}$
4. $f(x) = \frac{4}{\sqrt{1-x}}$

Problem 4

Evaluate derivatives using product/quotient rule:

1. $f(x) = \tan(x)$
2. $f(x) = \sec(x)$
3. $f(x) = \csc(x)$
4. (HARD) $f(x) = \arcsin(x)$