

This is a diagnostic quiz only; you will get 20 points for taking this quiz no matter what your score turns out to be. Please do your best anyway! I'm trying to get an idea of what your backgrounds are and how well you've retained material from 235. NO CALCULATORS.

1. Solve the equation $r = \frac{s+1}{s-1}$ for s .

2. Find all x in $[0, \pi]$ so that $\cos(3x) = -\frac{1}{2}$.

3. Calculate the following limits:

(a) $\lim_{x \rightarrow 1} \frac{1-x^2}{x-1}$.

(b) $\lim_{x \rightarrow \infty} \frac{x^2-1}{3-4x^2}$.

4. State the Mean Value Theorem.

5. Calculate the following derivatives:

(a) If $y = \csc(\sin x)$, find $\frac{dy}{dx}$.

(b) If $\sin^2 y = xy + 1$, find $\frac{dy}{dx}$ (in terms of x and y).

6. Calculate the following integrals:

(a) $\int \frac{\sin \sqrt{x}}{\sqrt{x}} dx.$

(b) $\int_0^1 (x^3 - 1)^2 dx.$