

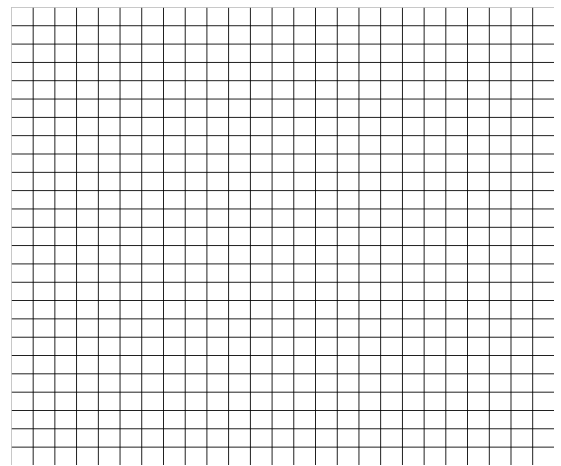


Math 181
Test 1B (Chapter 1)

Full Name _____
Recitation _____ Date _____

All questions worth 10 points except where noted.
No work = No credit. Scrap work not accepted.

1. Specify the domain of the function $f(x) = \frac{x^2 - x - 12}{4 - x}$, and sketch it on the plot provided
(be sure to label your axes and scale)



2. Specify the domain of the function $f(x) = \frac{1}{x^2 - 5} + \sqrt{(x+4)(x-2)}$

3. (13 pts.) For the function $f(x) = \frac{1}{x-1}$, $g(x) = \sqrt{3x-2}$, find $f \circ g(x)$ and its domain.

4. (12 pts.) On the interval $[0, 4\pi)$, when is the function $\frac{\sin(x+\pi)}{\cos\left(\frac{x}{4}\right)}$ equal to zero?

When is it undefined?

* All limit problems must be determined algebraically *

5. Find $\lim_{x \rightarrow 0} \frac{5 - \sqrt{x + 25}}{x}$

6. Find $\lim_{x \rightarrow 1} \frac{x^2 - 3x + 2}{|3 - 3x|}$ by evaluating the limit from the right and left

7. Find $\lim_{x \rightarrow \infty} \frac{x^2 + 3x^4 + 7x}{3x - x^3 + 17x^2}$ and $\lim_{x \rightarrow -\infty} \frac{x^2 + 3x^4 + 7x}{3x - x^3 + 17x^2}$

8. (15 pts.) Find all asymptotes (horizontal and vertical) for $f(x) = \frac{(3x-3)(4+2x)(x+7)}{(x+7)(6-4x)(x+12)}$

9. Sketch a function that has the following (and label)...

- a) a removable discontinuity
- b) an infinite discontinuity
- c) a jump discontinuity
- d) a horizontal asymptote
- e) a vertical asymptote
- f) at least one horizontal tangent