Tutorial Sheet **2526-MA140**
Assignment PS-2 due 10/19/2025 at 05:00pm BST

Problem 1. **(1 point)**

Use the Squeeze Theorem to evaluate the limit $\lim_{x\to 2} f(x)$, if

$$4x-4 \le f(x) \le x^2 \qquad \text{on } [0,4].$$

Enter **DNE** if the limit does not exist.

Limit = ____

Problem 2. **(1 point)**

A function is given below. Evaluate the indicated limits numerically.

$$f(x) = \frac{x^2+8x+16}{x^3-5x^2-48x+252}$$

Enter **INF** for ∞, **-INF** for $-\infty$, or **DNE** if the limit does not exist, but is neither ∞ nor $-\infty$.

a) $\lim_{x\to 6^-} f(x)$ = ____

b) $\lim_{x\to 6^+} f(x)$ = ____

c) $\lim_{x\to 6} f(x)$ = ____

Problem 3. **(1 point)**

Evaluate the limits.

$$g(x) = \begin{cases} 4x+4 & x<7 \\ 28 & x=7 \\ 4x-4 & x>7 \end{cases}$$

Enter **DNE** if the limit does not exist.

a) $\lim_{x\to 7^-} g(x)$ = ____

b) $\lim_{x\to 7^+} g(x)$ = ____

c) $\lim_{x\to 7} g(x)$ = ____

d) $g(7)$ = ____

Problem 4. **(1 point)**

Let

$$f(x) = \begin{cases} 12 & \text{if } x<-3 \\ -x+9 & \text{if } -3\le x<6 \\ 7 & \text{if } x=6 \\ 9 & \text{if } x>6. \end{cases}$$

Sketch the graph of this function and find the following limits, if they exist.
(*If a limit does not exist, enter* **DNE**.)

1. $\lim_{x\to -3^-} f(x)$ = ___
2. $\lim_{x\to -3^+} f(x)$ = ___
3. $\lim_{x\to -3} f(x)$ = ___
4. $\lim_{x\to 6^-} f(x)$ = ___
5. $\lim_{x\to 6^+} f(x)$ = ___
6. $\lim_{x\to 6} f(x)$ = ___

Problem 5. **(1 point)**

Let

$$f(x) = \begin{cases} b-2x & \text{if } x<5 \\ -\dfrac{150}{x-b} & \text{if } x\ge 5. \end{cases}$$

Find the two values of b for which f is a continuous function at 5.

The one with the greater absolute value is b = ______.

Problem 6. **(1 point)**

Warning! You may attempt this question only once!

Sketch the graph of the function f to determine the type of discontinuity at each x-value.

$$f(x) = \begin{cases} x^2+2, & \text{if } x < -3 \\ -5, & \text{if } x = -3 \\ -3x+2, & \text{if } -3 < x \leq 0 \\ \dfrac{-4x}{(x-3)^2}, & \text{if } 0 < x < 3 \\ \dfrac{1}{x^2+1}, & \text{if } 3 \leq x \end{cases}$$

- choose one
- removable
- jump
- infinite

1. What type of discontinuity does f have at $x = -3$?

- choose one
- removable
- jump
- infinite

2. What type of discontinuity does f have at $x = 0$?

- choose one
- removable
- jump
- infinite

3. What type of discontinuity does f have at $x = 3$?