Problem 1. Suppose $f(x)$ is a continuous function satisfying
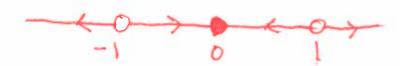
1. $f(-1) = 0$

2. $f(0) = 0,$

3. $f(1) = 0,$

4. $\lim\limits_{x \to \infty} f(x) = \infty.$

If the system $\dot{x} = f(x)$ has no semi-stable fixed points, sketch a phase portrait for this system.

Problem 2. Suppose $f(x)$ is a continuous function satisfying

1. $f(-1) = 0$

2. $f(0) = 0,$

3. $f(1) = 0,$

4. $f'(0) = 1.$

If the system $\dot{x} = f(x)$ has no semi-stable fixed points, sketch a phase portrait for this system.

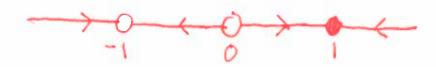**Problem 1.** Suppose $f(x)$ is a continuous function satisfying

1. $f(-1) = 0$

2. $f(0) = 0$,

3. $f(1) = 0$,

4. $\lim_{x \to \infty} f(x) = -\infty$.

If the system $\dot{x} = f(x)$ has no semi-stable fixed points, sketch a phase portrait for this system.

Problem 2. Suppose $f(x)$ is a continuous function satisfying

1. $f(-1) = 0$

2. $f(0) = 0$,

3. $f(1) = 0$,

4. $f'(0) = -1$.

If the system $\dot{x} = f(x)$ has no semi-stable fixed points, sketch a phase portrait for this system.