

**Problem 1** *Use the formal definition to prove that*

$$\lim_{n \rightarrow \infty} -n^2 + n = -\infty.$$

**Problem 2** *Let the sequence  $\{a_n\} = \{r^n\}$ . Find  $\limsup a_n$  and  $\liminf a_n$  regarding the value of  $r$ .*

For exercise 3 to 6, use the formal definition to prove the given limits

**Problem 3**

$$\lim_{x \rightarrow 1} \frac{2 + 4x}{3} = 2.$$

**Problem 4**

$$\lim_{x \rightarrow -3/2} \frac{9 - 4x^2}{3 + 2x} = 6.$$

**Problem 5**

$$\lim_{x \rightarrow 2} \frac{1}{x} = \frac{1}{2}.$$