Each problem is worth 5 points. Clear and complete justification is required for full credit.

1. Determine whether $\sum_{n=1}^{\infty} \frac{(-1)^n}{\sqrt{n}}$ converges or diverges. By AST

- Does it alternate? Yes, $b_{1_n} (-1)^n$
- $\lim_{n \to \infty} \frac{1}{\sqrt{n}} = 0$
- $f(x) = \frac{1}{\sqrt{n}}$ so $f'(x) = -\frac{1}{2} \cdot \frac{1}{2} \cdot x^{-3/2}$ is always decreasing. $n^{3/2}$ always $+$

2. Determine whether $\sum_{n=1}^{\infty} \frac{1}{3n^2}$ converges or diverges.

- $\frac{1}{3} \sum_{n=1}^{\infty} \frac{1}{n^2}$ it is a $p$ series $p = 2$, $2 > 1$ so this converges

Exactly.