

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/c $(-1)^n$

✓ • $\lim_{x \rightarrow \infty} \frac{1}{\sqrt{n}} = 0$?

✓ • $f(x) = \frac{1}{\sqrt{x}}$ so $f'(x) = -\frac{1}{2}x^{-3/2}$ or $-\frac{1}{2x^{3/2}}$ is always decreasing [b/c $n \geq 1$ $n^{3/2}$ always +
 $\frac{d}{dx} (+\frac{1}{2}) = \text{always -}$]

Excellent!

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

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

Exactly.