9. [15 points] Suppose that we know that $\sum_{n=1}^{\infty} a_n$ converges—but we don't know what a_n is. For each of the series below, determine whether it converges, diverges, or we cannot tell (that is, there could be one value for a_n that would converge and one that would not). Circle your answer and provide a short but careful explanation for your answer (how do we know the series converges or diverges?, or, what examples show that we cannot tell?).

(a) [3 points of 15] $\sum_{n=1}^{\infty} |a_n|$ converges diverges cannot tell

(b) [3 points of 15] $\sum_{n=1}^{\infty} (-1)^n |a_n|$ converges diverges cannot tell

(c) [3 points of 15] $\sum_{n=1}^{\infty} \frac{a_n+1}{a_n+5}$ converges diverges cannot tell

(d) [3 points of 15] $\sum_{n=1}^{\infty} \frac{a_n}{n^2}$ converges diverges cannot tell

(e) [3 points of 15] $\sum_{n=1}^{\infty} \frac{3^n a_n}{n^3}$ converges diverges cannot tell