2. [8 points] Suppose that $a_n$, $b_n$, and $c_n$ are sequences with the following properties:

- The sequence $a_n$ is bounded
- The series $\sum_{n=1}^{\infty} b_n$ converges absolutely
- $\frac{1}{n^2 + 1} \leq c_n \leq \frac{1}{n}$ for all $n \geq 1$

Determine whether the following statements are **always**, **sometimes**, or **never** true, and circle the appropriate answer for each part. No justification is necessary.

a. [2 points] The sequence $b_n$ converges to 0.

   Circle one:  
   \begin{tabular}{c c c c}
   Always & Sometimes & Never \\
   \end{tabular}

b. [2 points] $\sum_{n=1}^{\infty} \frac{c_n}{n}$ diverges.

   Circle one:  
   \begin{tabular}{c c c c}
   Always & Sometimes & Never \\
   \end{tabular}

c. [2 points] The sequence $a_n$ converges.

   Circle one:  
   \begin{tabular}{c c c c}
   Always & Sometimes & Never \\
   \end{tabular}

d. [2 points] The series $\sum_{n=1}^{\infty} \frac{1}{n^3 c_n}$ converges.

   Circle one:  
   \begin{tabular}{c c c c}
   Always & Sometimes & Never \\
   \end{tabular}