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Assignment: HW-6 [Sections 10.4, 10.5 & 10.6]

Does the series $\sum_{n=1}^{\infty} (-1)^{n+1} (0.2)^n$ converge absolutely, converge conditionally, or diverge?

A series $\sum a_n$ converges absolutely (is absolutely convergent) if the corresponding series of absolute values, $\sum |a_n|$, converges. If the series converges, but is not absolutely convergent, then the series converges conditionally. Otherwise, the series diverges.

Find the terms of the corresponding series of absolute values.

$$|(-1)^{n+1} (0.2)^n| = (0.2)^n$$

The corresponding series of absolute values, $\sum_{n=1}^{\infty} (0.2)^n$ is a geometric series. Identify the value of r .

$$r = 0.2$$

A geometric series converges if $|r| < 1$. Therefore, the series of absolute values converges.

A series whose corresponding series of absolute values converges, converges absolutely. Therefore, $\sum_{n=1}^{\infty} (-1)^{n+1} (0.2)^n$ converges absolutely.