Math 141
Quiz 5
March 23, 2016

name Daryl Rhea

calculators? You don't need no stinkin' calculators

For problems, #1 and #2,

- Test the series for **convergence or divergence**.
- **Name** the test utilized.
- **Support** your conclusion.
- If convergent, find the **sum,** whenever possible.

1. $\sum_{n=1}^{\infty} \frac{2n}{n+1}$

Test:

nth term test for divergence

Support / work:

$\lim_{n \to \infty} \frac{2n}{n+1} = 2 \neq 0$

series diverges

Converge/diverge:

diverges

Sum, if possible.

2. $\sum_{n=0}^{\infty} (-1)^n \frac{2^{n-1}}{3^n} = \sum_{n=0}^{\infty} \frac{1}{2}\left(-\frac{2}{3}\right)^n$

Test:

geometric

Support / work:

$r = -2/3$

$0 < |-2/3| < 1$, converges

Converge/diverge:

converges

Sum, if possible.

$S = \frac{1/2}{1-(-2/3)} = \frac{1/2}{5/3} = 3/10$

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1. $\sum_{n=1}^{\infty} \frac{2n}{n+1}$

Test:
n^{th} term test for divergence

Support / work:
$\lim_{n\to\infty} \frac{2n}{n+1} = 2 \neq 0$
series diverges

Converge/diverge:
diverges

Sum, if possible.

2. $\sum_{n=0}^{\infty} (-1)^n \frac{2^n}{3^{n-1}} = \sum_{n=0}^{\infty} 3\left(-\frac{2}{3}\right)^n$

Test:

Support / work:
$r = -\frac{2}{3}$

$0 < \left|-\frac{2}{3}\right| < 1$, converges

Converge/diverge:
converges

Sum, if possible.
$S = \frac{3}{1-(-\frac{2}{3})} = \frac{3}{\frac{5}{3}} = \frac{9}{5}$

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- Test the series for **convergence or divergence**.
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- **Support** your conclusion.
- If convergent, find the **sum,** whenever possible.

1. $\sum_{n=1}^{\infty} \frac{n^2}{2n^2+1}$

Test:
n^{th} term test for divergence

Support / work:

$\lim_{n\to\infty} \frac{n^2}{2n^2+1} = \frac{1}{2} \neq 0$

series diverges

Converge/diverge:

diverges

Sum, if possible.

2. $\sum_{n=0}^{\infty} (-1)^n \frac{2^n}{3^{n-1}} = \sum_{n=0}^{\infty} 3\left(-\frac{2}{3}\right)^n$

Test:

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Sum, if possible.

$S = \frac{3}{1-(-\frac{2}{3})} = \frac{3}{5/3} = \frac{9}{5}$