MATH 202, Spring 2024 **Name:** _____
In class work 18 **Row and Seat**: _____

In class work **18** has questions **1** through **1** with a total of **6** points.

"Folks are usually about as happy as they make their minds up to be."

ABRAHAM LINCOLN

Fun facts to know and tell: For all $k \in \mathbf{Z}_{\geq 0}$, we have

$$(k+1)! = (k+1)\,k!$$
$$(k+2)! = (k+1)(k+2)\,k!$$
$$(2k+1)! = (2k+1)(2k)!$$
$$(2k+2)! = (2k+1)(2k+1)(2k)!$$

1. Use the RT to determine all real numbers x that make the given series converge absolutely.

2 (a) $\displaystyle\sum_{k=1}^{\infty} \frac{x^k}{\sqrt{k}}$

2 (b) $\displaystyle\sum_{k=0}^{\infty} \frac{(k!)^2}{(2k)!} x^k$

2 (c) $\sum_{k=0}^{\infty} \frac{(2x+1)^k}{k^2+1}$