

February 7

If you were a Winter Olympian,
what sport would you participate in?
Why?

Period	Start	End	Duration
1	7:30	8:15	:45
2	8:20	9:05	:45
3	9:10	9:55	:45
4	10:00	10:50	:50
5 (lunch)	10:50	11:35	:45
6	11:35	12:20	:45
7	12:25	1:10	:45
8	1:15	2:00	:45
Pep Rally	2:00	2:49	:49



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Students will verbally explain how to
find the interval and radius of
convergence

(using the words:
r-value, geometric...)



Radius of Convergence

Half the length of the interval of convergence

Distance from the center of the interval of convergence to the "edge"

$$\text{I.o.C: } a < x < b$$

$$\text{radius: } \left| \frac{b-a}{2} \right|$$

Find the radius of convergence

$$\sum_{n=0}^{\infty} (x-3)^n$$

Geometric Series

→ converges if $|r| < 1$
 $-1 < r < 1$

$$r = x - 3$$

$$\begin{array}{ccc} -1 < x-3 < 1 \\ +3 & +3 & +3 \end{array}$$

$$\text{I.o.C: } 2 < x < 4 \quad \text{R.o.C: } \left| \frac{4-2}{2} \right| = 1$$

$$\sum_{n=1}^{\infty} (2x+3)^n$$

$$-1 < 2x+3 < 1$$

$$-4 < 2x < -2$$

$$-2 < x < -1$$

$$\text{I.o.C} \uparrow$$

R.o.C:

$$\left| \frac{-1-(-2)}{2} \right| = \frac{1}{2}$$

Find the
radius of
convergence

$$\sum_{n=0}^{\infty} \frac{(x+4)^n}{5^n}$$

$$= \sum_{n=0}^{\infty} \left(\frac{x+4}{5} \right)^n$$

$$r = \frac{x+4}{5}$$

$$-1 < \frac{x+4}{5} < 1$$

$$-5 < x+4 < 5$$

$$\text{I.o.C: } -9 < x < 1$$

R.o.C:

$$\left| \frac{1-(-9)}{2} \right| = 5$$

$$\sum_{n=0}^{\infty} \left(\frac{x^2-4}{6} \right)^n$$

$$r = \frac{x^2-4}{6}$$

$$-1 < \frac{x^2-4}{6} < 1$$

$$-6 < x^2-4 < 6$$

$$-2 < x^2 < 10$$

$$\sqrt{-2} < \sqrt{x^2} < \sqrt{10}$$

$$-\sqrt{10} < x < \sqrt{10}$$

R.o.C:

$$\left| \frac{\sqrt{10}-\sqrt{-10}}{2} \right| = \sqrt{10}$$

$$\frac{2\sqrt{10}}{2} = \sqrt{10}$$