**Developing your intuition:** For each of the following series, guess if it diverges, converges conditionally or converges absolutely. Keep in mind that you must answer two separate questions: 1. Does the series converge? and 2. Does the series converge absolutely? Name the test(s) you would use to answer each of these questions. Usually you are required to give a detailed solution, but for this worksheet, just briefly describe your overall strategy.

1. $\displaystyle\sum_{n=1}^{\infty} \frac{(-1)^n(n+\frac{1}{2})}{n-\frac{1}{2}}$

2. $\displaystyle\sum_{n=1}^{\infty} \frac{(-1)^n\, n}{e^n}$

3. $\displaystyle\sum_{n=1}^{\infty} \frac{2^n}{n!}$

4. $\displaystyle\sum_{n=1}^{\infty} \frac{(\sin n)2^n}{n!}$

5. $\displaystyle\sum_{n=2}^{\infty} \frac{(-1)^n(n^3+1)}{n^4+n-4}$

6. $\displaystyle\sum_{n=1}^{\infty} \frac{\cos^2 n}{n^{3/2}}$

7. $\displaystyle\sum_{n=1}^{\infty} \frac{(-1)^{n+1}}{n^3+n}$

8. $\displaystyle\sum_{n=2}^{\infty} \frac{(-1)^n \arctan n}{\sqrt{n}}$

9. $\displaystyle\sum_{n=1}^{\infty} \frac{(-1)^n \ln n}{n^2}$

10. $\displaystyle\sum_{n=2}^{\infty} \frac{(-1)^n\, n}{(\ln n)^2}$

11. $\displaystyle\sum_{n=1}^{\infty} \frac{(-1)^n \sqrt{n^7+n}}{\sqrt{n^9+n^5}}$

12. $\displaystyle\sum_{n=1}^{\infty} \frac{(-1)^n \sqrt{n^7+n}}{\sqrt{n^{10}+n^5}}$

13. $\displaystyle\sum_{n=1}^{\infty} \frac{(-1)^n \, 10n^2}{n^4+1}$

14. $\displaystyle\sum_{n=2}^{\infty} \frac{1}{n\sqrt{\ln n}}$

15. $\displaystyle\sum_{n=1}^{\infty} \frac{n(-2)^n}{n!}$

16. $\displaystyle\sum_{n=1}^{\infty} \frac{2-5^n}{11^{n-1}(-1)^n}$

17. $\displaystyle\sum_{n=1}^{\infty} \sqrt{n} 2^{n+1}$

18. $\displaystyle\sum_{n=1}^{\infty} \frac{(-1)^n}{\sqrt{4n^5+n^4-1}}$

19. $\displaystyle\sum_{n=1}^{\infty} (-1)^{n+1} \frac{3^n \, n!}{1 \cdot 3 \cdot 5 \cdot 7 \ldots (2n-1)}$

20. $\displaystyle\sum_{n=1}^{\infty} \frac{(-1)^n \sin(n^3)}{2^n}$

21. $\displaystyle\sum_{n=1}^{\infty} \frac{(-1)^n \, n!}{e^{n^2}}$