

I LOVE 2 CONVERGENT SUM AND U CAN 2!

■ In Problems 64–92, determine whether the series converges.

$$64. \sum_{n=1}^{\infty} \frac{8^n}{n!}$$

$$66. \sum_{n=1}^{\infty} \frac{(-2)^{n-1}}{n^2}$$

$$68. \sum_{n=1}^{\infty} \frac{5 + e^n}{3^n}$$

$$70. \sum_{n=1}^{\infty} \frac{n2^n}{3^n}$$

$$72. \sum_{n=1}^{\infty} \frac{n^2}{n^2 + 1}$$

$$74. \sum_{n=1}^{\infty} \frac{(n-1)!}{n^2}$$

$$76. \sum_{n=1}^{\infty} e^n$$

$$78. \sum_{n=1}^{\infty} \frac{n+1}{n^3+6}$$

$$80. \sum_{n=1}^{\infty} \frac{(-1)^{n-1}}{\sqrt{3n-1}}$$

$$65. \sum_{n=1}^{\infty} \frac{1}{4n+3}$$

$$67. \sum_{n=1}^{\infty} \frac{(-1)^{n-1}}{2n+1}$$

$$69. \sum_{n=2}^{\infty} \frac{n+2}{n^2-1}$$

$$71. \sum_{n=0}^{\infty} \frac{(0.1)^n}{n!}$$

$$73. \sum_{n=1}^{\infty} \frac{1+3^n}{4^n}$$

$$75. \sum_{n=1}^{\infty} \frac{(2n)!}{(n!)^2}$$

$$77. \sum_{n=0}^{\infty} e^{-n}$$

$$79. \sum_{n=1}^{\infty} \frac{5n+2}{2n^2+3n+7}$$

$$81. \sum_{n=1}^{\infty} \frac{(-1)^{n-1}2^n}{n^2}$$

$$82. \sum_{n=1}^{\infty} \frac{1}{\sqrt{n^2(n+2)}}$$

$$84. \sum_{n=1}^{\infty} \frac{2n^3 - 1}{n^3 + 1}$$

$$86. \sum_{n=1}^{\infty} \frac{6}{n + 2^n}$$

$$88. \sum_{n=2}^{\infty} \frac{3}{\ln n^2}$$

$$90. \sum_{n=1}^{\infty} \frac{\sin n^2}{n^2}$$

$$92. \sum_{n=1}^{\infty} \frac{1}{n^2} \tan\left(\frac{1}{n}\right)$$

$$83. \sum_{n=1}^{\infty} \frac{n(n+1)}{\sqrt{n^3 + 2n^2}}$$

$$85. \sum_{n=1}^{\infty} \frac{n+1}{3n^2 - 2}$$

$$87. \sum_{n=1}^{\infty} \frac{2n+1}{\sqrt{3n^3 - 2}}$$

$$89. \sum_{n=1}^{\infty} \frac{\sin n}{n^2}$$

$$91. \sum_{n=1}^{\infty} \frac{\cos(n\pi)}{n}$$

■ In Problems 102–106, for what values of a does the series converge?

$$102. \sum_{n=1}^{\infty} \left(\frac{2}{n}\right)^a$$

$$103. \sum_{n=1}^{\infty} \left(\frac{2}{a}\right)^n, a > 0$$

$$104. \sum_{n=1}^{\infty} (\ln a)^n, a > 0$$

$$105. \sum_{n=1}^{\infty} \frac{\ln n}{n^a}$$

$$106. \sum_{n=1}^{\infty} (-1)^n \arctan\left(\frac{a}{n}\right), a > 0$$