

Section 11.1 solutions

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$$6. \left\{ \cos \frac{n\pi}{2} \right\} = \left\{ \cos \frac{\pi}{2}, \cos \pi, \cos \frac{3\pi}{2}, \cos 2\pi, \dots \right\} \\ = \{0, -1, 0, 1, \dots\}$$

$$24. \lim_{n \rightarrow \infty} a_n = \lim_{n \rightarrow \infty} \frac{n^3}{n^3+1} = \lim_{n \rightarrow \infty} \frac{1}{1+\frac{1}{n^3}} = \frac{1}{1+0} = \boxed{1}$$

$$28. \lim_{n \rightarrow \infty} a_n = \lim_{n \rightarrow \infty} \frac{3^{n+2}}{5^n} = 9 \lim_{n \rightarrow \infty} \left(\frac{3}{5}\right)^n = 9 \cdot 0 = \boxed{0}$$

Section 11.2 Solutions

$$18. 4 + 3 + \frac{9}{4} + \frac{27}{16} + \dots \quad \text{common ratio, } r = \frac{3}{4} \text{ and} \\ \text{common factor, } a = 4. \text{ So} \\ 4 + 3 + \frac{9}{4} + \frac{27}{16} + \dots = \frac{4}{1 - \frac{3}{4}} = \boxed{16}$$

$$20. 2 + 0.5 + 0.125 + 0.03125 + \dots$$

common ratio, $r = \frac{1}{4}$; common factor, $a = 2$. So

$$2 + 0.5 + 0.125 + 0.03125 + \dots = \frac{2}{1 - \frac{1}{4}} = \boxed{\frac{8}{3}}$$

$$24. \sum_{n=0}^{\infty} \frac{1}{(\sqrt{2})^n} = \sum_{n=0}^{\infty} \left(\frac{1}{\sqrt{2}}\right)^n, \text{ where } a=1, |r| = \left|\frac{1}{\sqrt{2}}\right| < 1$$

$$\text{So } \sum_{n=0}^{\infty} \frac{1}{(\sqrt{2})^n} = \frac{1}{1 - \frac{1}{\sqrt{2}}} = \boxed{\frac{\sqrt{2}}{\sqrt{2}-1}}$$