11.2: 30, $\sum_{k=1}^{\infty} \frac{k^2}{k^2-2k+5}$ is divergent, because:

$$\lim_{k\to\infty} \frac{k^2}{k^2-2k+5} = \lim_{k\to\infty} \frac{k^2}{k^2} = 1 > 0$$

11.2: 36, $\sum_{n=1}^{\infty} \frac{1}{1+(\frac{2}{3})^n}$ is divergent, because:

$$\lim_{n\to\infty} \left(\frac{2}{3}\right)^n = 0, \quad \lim_{n\to\infty} \frac{1}{1+(\frac{2}{3})^n} = 1 > 0$$

11.3: 20, $\sum_{n=3}^{\infty} \frac{3n-4}{n^2-2n}$ is divergent. because

~~$\lim_{n\to\infty} \frac{3n-4}{n^2-2n} = \lim_{n\to\infty} \frac{1}{n}$, $\frac{3n-4}{n^2-2n}$ and $\frac{1}{n}$ are similar.~~

$$\lim_{n\to\infty} \left(\frac{\frac{3n-4}{n^2-2n}}{\frac{1}{n}} = \frac{3n-4}{n-2} \right) = 3,$$ we know that $\sum_{n=3}^{\infty} \frac{1}{n}$ is divergent. so $\sum_{n=3}^{\infty} \frac{3n-4}{n^2-2n}$ is divergent.

11.4: 26 $\sum_{n=2}^{\infty} \frac{1}{n\sqrt{n^2-1}}$ is convergent. because

$$\lim_{n\to\infty} \left(\frac{\frac{1}{n\sqrt{n^2-1}}}{\frac{1}{n^2}} \right) = 1,$$ we know that $\sum_{n=2}^{\infty} \frac{1}{n^2}$ is convergent, so $\sum_{n=2}^{\infty} \frac{1}{n\sqrt{n^4}}$ is convergent

11.4: 28 $\sum_{n=1}^{\infty} \frac{e^{1/n}}{n}$ is divergent, because

$$\lim_{n\to\infty} \left(\frac{\frac{e^{\frac{1}{n}}}{n}}{\frac{1}{n}} \right) = 1$$, we know $\sum_{n=1}^{\infty} \frac{1}{n}$ is divergent, so $\sum_{n=1}^{\infty} \frac{e^{\frac{1}{n}}}{n}$ is divergent.

11.5: 18. $\sum_{n=1}^{\infty} (-1)^n \cos\left(\frac{\pi}{n}\right)$ is divergent, because

$$\lim_{n\to\infty} \cos\left(\frac{\pi}{n}\right) = \cos(0) = 1 > 0$$