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1. (i)

$$\lim_{n\to\infty}\left(\frac{-3n^4+2n^2+n+1}{-7n^4+25}\right) \tag{1}$$

$$\Leftrightarrow \lim_{n\to\infty}\left(\frac{n^4}{n^4}\cdot\frac{-3+\frac{2}{n^2}+\frac{1}{n^3}+\frac{1}{n^4}}{-7+\frac{25}{n^4}}\right) \tag{2}$$

$$\Leftrightarrow \frac{3}{7} \tag{3}$$

(ii)

$$\lim_{n\to\infty}\left(\frac{-3n^4+2n^2+n+1}{-7n^5+25}\right) \tag{4}$$

$$\Leftrightarrow \lim_{n\to\infty}\left(\frac{1}{n^5}\cdot\frac{-3+\frac{2}{n^2}+\frac{1}{n^3}+\frac{1}{n^4}}{-7+\frac{25}{n^5}}\right) \tag{5}$$

$$\Leftrightarrow 0 \tag{6}$$

(iii)

$$\lim_{n\to\infty}\left(\frac{-3n^5+2n^2+n+1}{-7n^4+25}\right) \tag{7}$$

$$\Leftrightarrow \lim_{n\to\infty}\left(\frac{n}{1}\cdot\frac{-3+\frac{2}{n^3}+\frac{1}{n^4}+\frac{1}{n^5}}{-7+\frac{25}{n^4}}\right) \tag{8}$$

$$\Leftrightarrow \infty \tag{9}$$

(iv)

$$\lim_{n\to\infty}\left(\frac{6n^3+2n-3}{9n^2+2}-\frac{2n^3+5n^2+7}{3n^2+3}\right) \tag{10}$$

$$\Leftrightarrow \lim_{n\to\infty} \textbf{TODO} \tag{11}$$

2. a) (i)

$$s_0 = 1 \tag{12}$$
$$s_1 = \frac{7}{5} \tag{13}$$
$$s_2 = \frac{39}{25} \tag{14}$$
$$s_3 = \frac{203}{125} \tag{15}$$
$$s_4 = \frac{1031}{625} \tag{16}$$
TODO (17)

(ii)

$$s_0 = 1 \tag{18}$$
$$s_1 = \frac{7}{2} \tag{19}$$
$$s_2 = \frac{39}{4} \tag{20}$$
$$s_3 = \frac{203}{20} \tag{21}$$
$$s_4 = \frac{1031}{40} \tag{22}$$
TODO (23)

(iii)

$$s_0 = 1 \tag{24}$$
$$s_1 = \frac{3}{5} \tag{25}$$
$$s_2 = \frac{19}{25} \tag{26}$$
$$s_3 = \frac{87}{125} \tag{27}$$
$$s_4 = \frac{451}{625} \tag{28}$$
TODO (29)

b) **TODO**

3. **TODO**

4. **TODO**