

## LISTA POWTÓRKOWA 3: KRESY

1. Dla każdego z poniższych zbiorów wyznacz kres górny i dolny oraz określ, czy kresy należą do zbioru.

(a)

$$A = \left\{ \frac{(-1)^n}{n^2} : n \in \mathbb{N} \right\},$$

(b)

$$B = \left\{ (-1)^n + \frac{(-1)^n}{n^2} : n \in \mathbb{N} \right\},$$

(c)

$$C = \left\{ (-1)^n - \frac{(-1)^n}{n^2} : n \in \mathbb{N} \right\},$$

(d)

$$D = \left\{ (-1)^m - \frac{(-1)^n}{n^2} : m, n \in \mathbb{N} \right\},$$

(e)

$$E = \left\{ \frac{m}{n} : m, n \in \mathbb{N} \wedge m^2 \leq 8n^2 \right\},$$

(f)

$$F = \left\{ \frac{m}{n} : m, n \in \mathbb{N} \wedge m^2 \leq 9n^2 \right\},$$

(g)

$$G = \left\{ \sqrt{x^2 - 4x + 4} : x \in (-3, 5) \right\},$$

(h)

$$H = \left\{ \sqrt{x^2 - 4x + 4} : x \in (1, 4) \right\},$$

(i)

$$I = \left\{ \frac{1}{n^2 - 6n + 10} : n \in \mathbb{N} \right\},$$

(j)

$$J = \left\{ \frac{1}{n^2 - 6n + 7} : n \in \mathbb{N} \right\},$$

(k)

$$K = \left\{ \frac{1}{n^2 - 6n + 4} : n \in \mathbb{N} \right\},$$

(l)

$$L = \left\{ \frac{m}{n} : m, n \in \mathbb{N} \wedge 4^n \leq 8^m \leq 12^n \right\},$$

(m)

$$M = \left\{ \frac{m}{n} : m, n \in \mathbb{N} \wedge 4^m \leq 8^n \leq 12^m \right\},$$

(n)

$$N = \left\{ \frac{m}{n} : 25n^2 \leq m^2 \leq 27n^2 \right\},$$

(o)

$$O = \left\{ \frac{m}{n} : 25n^3 \leq m^3 \leq 27n^3 \right\},$$

(p)

$$P = \left\{ \frac{m}{n} : 3^n \leq 8^m \leq 4^n \right\},$$

(q)

$$Q = \left\{ \frac{m}{n} : 3^n \leq 9^m \leq 4^n \right\},$$

(r)

$$R = \left\{ \frac{1}{10n - 37} : n \in \mathbb{N} \right\},$$

(s)

$$S = \left\{ 2^{\log_n 3} - 3^{\log_n 2} : n \in \mathbb{N} / \{1\} \right\},$$

(t)

$$T = \left\{ \frac{2^{\log_n 3}}{3^{\log_n 2}} : n \in \mathbb{N} / \{1\} \right\},$$

(u)

$$U = \left\{ 2^{2^{x^2}} : x \in \mathbb{R} \right\},$$

(v)

$$V = \left\{ 2^{2^{-x^2}} : x \in \mathbb{R} \right\},$$

(w)

$$W = \left\{ 2^{2^{x^3}} : x \in \mathbb{R} \right\},$$

(x)

$$X = \left\{ \frac{m^2 + n^2}{mn} : m, n \in \mathbb{N} \right\},$$

(y)

$$Y = \left\{ \frac{m^2 + 9n^2}{mn} : m, n \in \mathbb{N} \right\},$$

(z)

$$Z = \left\{ \frac{2m^2 + 7n^2}{mn} : m, n \in \mathbb{N} \right\}.$$