

s02-049

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1. Napíšte aspoň 6 prvkov a nájdite infimum, supréum, minimum a maximum množiny $A_1 = \{\frac{n+3}{3n+2}, n \in \mathbb{N}\}$.

$$A_1 = \left\{ \frac{4}{5}, \frac{5}{7}, \frac{6}{11}, \frac{7}{17}, \frac{8}{25}, \frac{9}{35}, \frac{10}{47}, \dots \right\}$$

$$\min A_1 = \frac{4}{5}$$

$$\max A_1 = \frac{4}{5}$$

$$\inf A_1 = \frac{4}{5}$$

$$\sup A_1 = \frac{4}{5}$$

2. Napíšte aspoň 6 prvkov a nájdite infimum, supréum, minimum a maximum množiny $A_2 = \{\frac{n+3}{3n+2}, n \in \mathbb{Z}\}$.

$$A_2 = \left\{ \frac{4}{5}, 0, -\frac{1}{4}, -2, \frac{3}{2}, \frac{4}{5}, \frac{5}{7}, \frac{6}{11}, \dots \right\}$$

$$\min A_2 = -2$$

$$\max A_2 = \frac{3}{2}$$

$$\inf A_2 = -2$$

$$\sup A_2 = \frac{3}{2}$$

3. Napíšte aspoň 6 prvkov a nájdite infimum, supréum, minimum a maximum množiny $A_3 = \{\frac{n+3}{3n+2}, n \in \mathbb{Q}, n \neq -\frac{2}{3}\}$.

$$A_3 = \left\{ \frac{4}{5}, \frac{5}{7}, \frac{6}{11}, \frac{7}{17}, \frac{8}{25}, \frac{9}{35}, \frac{10}{47}, \dots \right\}$$

$$\min A_3 = \frac{4}{5}$$

$$\max A_3 = \frac{4}{5}$$

$$\inf A_3 = -\infty$$

$$\sup A_3 = \infty$$

4. Nájdite všetky hromadné body množiny $A_4 = \{\frac{n+3}{3n+2}, n \in \mathbb{N}\}$.

$$\text{Hromadné body množiny } A_4 \text{ sú: } \frac{1}{3} \text{ lebo } \lim_{n \rightarrow \infty} \frac{n+3}{3n+2} = \lim_{n \rightarrow \infty} \frac{\frac{n}{n} + \frac{3}{n}}{\frac{3n}{n} + \frac{2}{n}} = \frac{1+0}{3+0} = \frac{1}{3}$$

5. Nájdite všetky hromadné body množiny $A_5 = \{\frac{n+3}{3n+2}, n \in \mathbb{Z}\}$.

$$\text{Hromadné body množiny } A_5 \text{ sú: } \frac{1}{3} \text{ lebo } \lim_{n \rightarrow \infty} \frac{n+3}{3n+2} = \lim_{n \rightarrow \infty} \frac{\frac{n}{n} + \frac{3}{n}}{\frac{3n}{n} + \frac{2}{n}} = \frac{1+0}{3+0} = \frac{1}{3}$$

$$\lim_{n \rightarrow -\infty} \frac{n+3}{3n+2} = \lim_{n \rightarrow -\infty} \frac{\frac{n}{n} + \frac{3}{n}}{\frac{3n}{n} + \frac{2}{n}} = \frac{1+0}{3+0} = \frac{1}{3}$$

6. Nájdite všetky hromadné body množiny $A_6 = \{\frac{n+3}{3n+2}, n \in \mathbb{Q}, n \neq -\frac{2}{3}\}$.

$$\text{Hromadné body množiny } A_6 \text{ sú: } \mathbb{Q} \text{ lebo existuje nekonečne veľa oholí bodu } \mathbb{Q}$$

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7. Určte množinu hromadných hodnôt E , \liminf , \limsup a \lim postupnosti $\{a_n\}_{n=1}^{\infty} = \left\{\frac{n+3}{3n+2}\right\}_{n=1}^{\infty}$.

$$E = \left\{ \frac{1}{3} \right\}$$

$$\liminf_{n \rightarrow \infty} a_n = \frac{1}{3}$$

$$\limsup_{n \rightarrow \infty} a_n = \frac{1}{3}$$

$$\lim_{n \rightarrow \infty} a_n = \frac{1}{3}$$

8. Vypíšte prvky a nájdite všetky hromadné body množiny $A_7 = \{\sin \frac{n\pi+0\pi}{4}, n \in \mathbb{N}\}$.

$$A_7 = \{0, 0, 1, 0, 0, -1, 0, 0, 1, 0, 0, -1, 0, 0, 1, 0, 0, -1, \dots\}$$

Hromadné body množiny A_7 sú: Hromadné body neexistujú lebo množina hromadné body

$\sin \frac{\pi}{4} = \frac{\sqrt{2}}{2}$
 $\sin \frac{2\pi}{4} = \sin \frac{\pi}{2} = 1$
 $\sin \frac{3\pi}{4} = \frac{\sqrt{2}}{2}$
 $\sin \frac{4\pi}{4} = \sin \pi = 0$
 $\sin \frac{5\pi}{4} = -\frac{\sqrt{2}}{2}$
 $\sin \frac{6\pi}{4} = \sin \frac{3\pi}{2} = -1$
 $\sin \frac{7\pi}{4} = -\frac{\sqrt{2}}{2}$
 $\sin \frac{8\pi}{4} = \sin 2\pi = 0$
 $\sin \frac{9\pi}{4} = \frac{\sqrt{2}}{2}$
 $\sin \frac{10\pi}{4} = \sin \frac{5\pi}{2} = 1$
 $\sin \frac{11\pi}{4} = \frac{\sqrt{2}}{2}$
 $\sin \frac{12\pi}{4} = \sin 3\pi = 0$
 $\sin \frac{13\pi}{4} = -\frac{\sqrt{2}}{2}$
 $\sin \frac{14\pi}{4} = \sin \frac{7\pi}{2} = -1$
 $\sin \frac{15\pi}{4} = -\frac{\sqrt{2}}{2}$
 $\sin \frac{16\pi}{4} = \sin 4\pi = 0$
 $\sin \frac{17\pi}{4} = \frac{\sqrt{2}}{2}$
 $\sin \frac{18\pi}{4} = \sin \frac{9\pi}{2} = 1$
 $\sin \frac{19\pi}{4} = \frac{\sqrt{2}}{2}$
 $\sin \frac{20\pi}{4} = \sin 5\pi = 0$
 $\sin \frac{21\pi}{4} = -\frac{\sqrt{2}}{2}$
 $\sin \frac{22\pi}{4} = \sin \frac{11\pi}{2} = -1$
 $\sin \frac{23\pi}{4} = -\frac{\sqrt{2}}{2}$
 $\sin \frac{24\pi}{4} = \sin 6\pi = 0$
 $\sin \frac{25\pi}{4} = \frac{\sqrt{2}}{2}$
 $\sin \frac{26\pi}{4} = \sin \frac{13\pi}{2} = 1$
 $\sin \frac{27\pi}{4} = \frac{\sqrt{2}}{2}$
 $\sin \frac{28\pi}{4} = \sin 7\pi = 0$
 $\sin \frac{29\pi}{4} = -\frac{\sqrt{2}}{2}$
 $\sin \frac{30\pi}{4} = \sin \frac{15\pi}{2} = -1$
 $\sin \frac{31\pi}{4} = -\frac{\sqrt{2}}{2}$
 $\sin \frac{32\pi}{4} = \sin 8\pi = 0$
 $\sin \frac{33\pi}{4} = \frac{\sqrt{2}}{2}$
 $\sin \frac{34\pi}{4} = \sin \frac{17\pi}{2} = 1$
 $\sin \frac{35\pi}{4} = \frac{\sqrt{2}}{2}$
 $\sin \frac{36\pi}{4} = \sin 9\pi = 0$
 $\sin \frac{37\pi}{4} = -\frac{\sqrt{2}}{2}$
 $\sin \frac{38\pi}{4} = \sin \frac{19\pi}{2} = -1$
 $\sin \frac{39\pi}{4} = -\frac{\sqrt{2}}{2}$
 $\sin \frac{40\pi}{4} = \sin 10\pi = 0$
 $\sin \frac{41\pi}{4} = \frac{\sqrt{2}}{2}$
 $\sin \frac{42\pi}{4} = \sin \frac{21\pi}{2} = 1$
 $\sin \frac{43\pi}{4} = \frac{\sqrt{2}}{2}$
 $\sin \frac{44\pi}{4} = \sin 11\pi = 0$
 $\sin \frac{45\pi}{4} = -\frac{\sqrt{2}}{2}$
 $\sin \frac{46\pi}{4} = \sin \frac{23\pi}{2} = -1$
 $\sin \frac{47\pi}{4} = -\frac{\sqrt{2}}{2}$
 $\sin \frac{48\pi}{4} = \sin 12\pi = 0$
 $\sin \frac{49\pi}{4} = \frac{\sqrt{2}}{2}$
 $\sin \frac{50\pi}{4} = \sin \frac{25\pi}{2} = 1$
 $\sin \frac{51\pi}{4} = \frac{\sqrt{2}}{2}$
 $\sin \frac{52\pi}{4} = \sin 13\pi = 0$
 $\sin \frac{53\pi}{4} = -\frac{\sqrt{2}}{2}$
 $\sin \frac{54\pi}{4} = \sin \frac{27\pi}{2} = -1$
 $\sin \frac{55\pi}{4} = -\frac{\sqrt{2}}{2}$
 $\sin \frac{56\pi}{4} = \sin 14\pi = 0$
 $\sin \frac{57\pi}{4} = \frac{\sqrt{2}}{2}$
 $\sin \frac{58\pi}{4} = \sin \frac{29\pi}{2} = 1$
 $\sin \frac{59\pi}{4} = \frac{\sqrt{2}}{2}$
 $\sin \frac{60\pi}{4} = \sin 15\pi = 0$
 $\sin \frac{61\pi}{4} = -\frac{\sqrt{2}}{2}$
 $\sin \frac{62\pi}{4} = \sin \frac{31\pi}{2} = -1$
 $\sin \frac{63\pi}{4} = -\frac{\sqrt{2}}{2}$
 $\sin \frac{64\pi}{4} = \sin 16\pi = 0$
 $\sin \frac{65\pi}{4} = \frac{\sqrt{2}}{2}$
 $\sin \frac{66\pi}{4} = \sin \frac{33\pi}{2} = 1$
 $\sin \frac{67\pi}{4} = \frac{\sqrt{2}}{2}$
 $\sin \frac{68\pi}{4} = \sin 17\pi = 0$
 $\sin \frac{69\pi}{4} = -\frac{\sqrt{2}}{2}$
 $\sin \frac{70\pi}{4} = \sin \frac{35\pi}{2} = -1$
 $\sin \frac{71\pi}{4} = -\frac{\sqrt{2}}{2}$
 $\sin \frac{72\pi}{4} = \sin 18\pi = 0$
 $\sin \frac{73\pi}{4} = \frac{\sqrt{2}}{2}$
 $\sin \frac{74\pi}{4} = \sin \frac{37\pi}{2} = 1$
 $\sin \frac{75\pi}{4} = \frac{\sqrt{2}}{2}$
 $\sin \frac{76\pi}{4} = \sin 19\pi = 0$
 $\sin \frac{77\pi}{4} = -\frac{\sqrt{2}}{2}$
 $\sin \frac{78\pi}{4} = \sin \frac{39\pi}{2} = -1$
 $\sin \frac{79\pi}{4} = -\frac{\sqrt{2}}{2}$
 $\sin \frac{80\pi}{4} = \sin 20\pi = 0$
 $\sin \frac{81\pi}{4} = \frac{\sqrt{2}}{2}$
 $\sin \frac{82\pi}{4} = \sin \frac{41\pi}{2} = 1$
 $\sin \frac{83\pi}{4} = \frac{\sqrt{2}}{2}$
 $\sin \frac{84\pi}{4} = \sin 21\pi = 0$
 $\sin \frac{85\pi}{4} = -\frac{\sqrt{2}}{2}$
 $\sin \frac{86\pi}{4} = \sin \frac{43\pi}{2} = -1$
 $\sin \frac{87\pi}{4} = -\frac{\sqrt{2}}{2}$
 $\sin \frac{88\pi}{4} = \sin 22\pi = 0$
 $\sin \frac{89\pi}{4} = \frac{\sqrt{2}}{2}$
 $\sin \frac{90\pi}{4} = \sin \frac{45\pi}{2} = 1$
 $\sin \frac{91\pi}{4} = \frac{\sqrt{2}}{2}$
 $\sin \frac{92\pi}{4} = \sin 23\pi = 0$
 $\sin \frac{93\pi}{4} = -\frac{\sqrt{2}}{2}$
 $\sin \frac{94\pi}{4} = \sin \frac{47\pi}{2} = -1$
 $\sin \frac{95\pi}{4} = -\frac{\sqrt{2}}{2}$
 $\sin \frac{96\pi}{4} = \sin 24\pi = 0$
 $\sin \frac{97\pi}{4} = \frac{\sqrt{2}}{2}$
 $\sin \frac{98\pi}{4} = \sin \frac{49\pi}{2} = 1$
 $\sin \frac{99\pi}{4} = \frac{\sqrt{2}}{2}$
 $\sin \frac{100\pi}{4} = \sin 25\pi = 0$
 $\sin \frac{101\pi}{4} = -\frac{\sqrt{2}}{2}$
 $\sin \frac{102\pi}{4} = \sin \frac{51\pi}{2} = -1$
 $\sin \frac{103\pi}{4} = -\frac{\sqrt{2}}{2}$
 $\sin \frac{104\pi}{4} = \sin 26\pi = 0$
 $\sin \frac{105\pi}{4} = \frac{\sqrt{2}}{2}$
 $\sin \frac{106\pi}{4} = \sin \frac{53\pi}{2} = 1$
 $\sin \frac{107\pi}{4} = \frac{\sqrt{2}}{2}$
 $\sin \frac{108\pi}{4} = \sin 27\pi = 0$
 $\sin \frac{109\pi}{4} = -\frac{\sqrt{2}}{2}$
 $\sin \frac{110\pi}{4} = \sin \frac{55\pi}{2} = -1$
 $\sin \frac{111\pi}{4} = -\frac{\sqrt{2}}{2}$
 $\sin \frac{112\pi}{4} = \sin 28\pi = 0$
 $\sin \frac{113\pi}{4} = \frac{\sqrt{2}}{2}$
 $\sin \frac{114\pi}{4} = \sin \frac{57\pi}{2} = 1$
 $\sin \frac{115\pi}{4} = \frac{\sqrt{2}}{2}$
 $\sin \frac{116\pi}{4} = \sin 29\pi = 0$
 $\sin \frac{117\pi}{4} = -\frac{\sqrt{2}}{2}$
 $\sin \frac{118\pi}{4} = \sin \frac{59\pi}{2} = -1$
 $\sin \frac{119\pi}{4} = -\frac{\sqrt{2}}{2}$
 $\sin \frac{120\pi}{4} = \sin 30\pi = 0$
 $\sin \frac{121\pi}{4} = \frac{\sqrt{2}}{2}$
 $\sin \frac{122\pi}{4} = \sin \frac{61\pi}{2} = 1$
 $\sin \frac{123\pi}{4} = \frac{\sqrt{2}}{2}$
 $\sin \frac{124\pi}{4} = \sin 31\pi = 0$
 $\sin \frac{125\pi}{4} = -\frac{\sqrt{2}}{2}$
 $\sin \frac{126\pi}{4} = \sin \frac{63\pi}{2} = -1$
 $\sin \frac{127\pi}{4} = -\frac{\sqrt{2}}{2}$
 $\sin \frac{128\pi}{4} = \sin 32\pi = 0$
 $\sin \frac{129\pi}{4} = \frac{\sqrt{2}}{2}$
 $\sin \frac{130\pi}{4} = \sin \frac{65\pi}{2} = 1$
 $\sin \frac{131\pi}{4} = \frac{\sqrt{2}}{2}$
 $\sin \frac{132\pi}{4} = \sin 33\pi = 0$
 $\sin \frac{133\pi}{4} = -\frac{\sqrt{2}}{2}$
 $\sin \frac{134\pi}{4} = \sin \frac{67\pi}{2} = -1$
 $\sin \frac{135\pi}{4} = -\frac{\sqrt{2}}{2}$
 $\sin \frac{136\pi}{4} = \sin 34\pi = 0$
 $\sin \frac{137\pi}{4} = \frac{\sqrt{2}}{2}$
 $\sin \frac{138\pi}{4} = \sin \frac{69\pi}{2} = 1$
 $\sin \frac{139\pi}{4} = \frac{\sqrt{2}}{2}$
 $\sin \frac{140\pi}{4} = \sin 35\pi = 0$
 $\sin \frac{141\pi}{4} = -\frac{\sqrt{2}}{2}$
 $\sin \frac{142\pi}{4} = \sin \frac{71\pi}{2} = -1$
 $\sin \frac{143\pi}{4} = -\frac{\sqrt{2}}{2}$
 $\sin \frac{144\pi}{4} = \sin 36\pi = 0$
 $\sin \frac{145\pi}{4} = \frac{\sqrt{2}}{2}$
 $\sin \frac{146\pi}{4} = \sin \frac{73\pi}{2} = 1$
 $\sin \frac{147\pi}{4} = \frac{\sqrt{2}}{2}$
 $\sin \frac{148\pi}{4} = \sin 37\pi = 0$
 $\sin \frac{149\pi}{4} = -\frac{\sqrt{2}}{2}$
 $\sin \frac{150\pi}{4} = \sin \frac{75\pi}{2} = -1$
 $\sin \frac{151\pi}{4} = -\frac{\sqrt{2}}{2}$
 $\sin \frac{152\pi}{4} = \sin 38\pi = 0$
 $\sin \frac{153\pi}{4} = \frac{\sqrt{2}}{2}$
 $\sin \frac{154\pi}{4} = \sin \frac{77\pi}{2} = 1$
 $\sin \frac{155\pi}{4} = \frac{\sqrt{2}}{2}$
 $\sin \frac{156\pi}{4} = \sin 39\pi = 0$
 $\sin \frac{157\pi}{4} = -\frac{\sqrt{2}}{2}$
 $\sin \frac{158\pi}{4} = \sin \frac{79\pi}{2} = -1$
 $\sin \frac{159\pi}{4} = -\frac{\sqrt{2}}{2}$
 $\sin \frac{160\pi}{4} = \sin 40\pi = 0$
 $\sin \frac{161\pi}{4} = \frac{\sqrt{2}}{2}$
 $\sin \frac{162\pi}{4} = \sin \frac{81\pi}{2} = 1$
 $\sin \frac{163\pi}{4} = \frac{\sqrt{2}}{2}$
 $\sin \frac{164\pi}{4} = \sin 41\pi = 0$
 $\sin \frac{165\pi}{4} = -\frac{\sqrt{2}}{2}$
 $\sin \frac{166\pi}{4} = \sin \frac{83\pi}{2} = -1$
 $\sin \frac{167\pi}{4} = -\frac{\sqrt{2}}{2}$
 $\sin \frac{168\pi}{4} = \sin 42\pi = 0$
 $\sin \frac{169\pi}{4} = \frac{\sqrt{2}}{2}$
 $\sin \frac{170\pi}{4} = \sin \frac{85\pi}{2} = 1$
 $\sin \frac{171\pi}{4} = \frac{\sqrt{2}}{2}$
 $\sin \frac{172\pi}{4} = \sin 43\pi = 0$
 $\sin \frac{173\pi}{4} = -\frac{\sqrt{2}}{2}$
 $\sin \frac{174\pi}{4} = \sin \frac{87\pi}{2} = -1$
 $\sin \frac{175\pi}{4} = -\frac{\sqrt{2}}{2}$
 $\sin \frac{176\pi}{4} = \sin 44\pi = 0$
 $\sin \frac{177\pi}{4} = \frac{\sqrt{2}}{2}$
 $\sin \frac{178\pi}{4} = \sin \frac{89\pi}{2} = 1$
 $\sin \frac{179\pi}{4} = \frac{\sqrt{2}}{2}$
 $\sin \frac{180\pi}{4} = \sin 45\pi = 0$
 $\sin \frac{181\pi}{4} = -\frac{\sqrt{2}}{2}$
 $\sin \frac{182\pi}{4} = \sin \frac{91\pi}{2} = -1$
 $\sin \frac{183\pi}{4} = -\frac{\sqrt{2}}{2}$
 $\sin \frac{184\pi}{4} = \sin 46\pi = 0$
 $\sin \frac{185\pi}{4} = \frac{\sqrt{2}}{2}$
 $\sin \frac{186\pi}{4} = \sin \frac{93\pi}{2} = 1$
 $\sin \frac{187\pi}{4} = \frac{\sqrt{2}}{2}$
 $\sin \frac{188\pi}{4} = \sin 47\pi = 0$
 $\sin \frac{189\pi}{4} = -\frac{\sqrt{2}}{2}$
 $\sin \frac{190\pi}{4} = \sin \frac{95\pi}{2} = -1$
 $\sin \frac{191\pi}{4} = -\frac{\sqrt{2}}{2}$
 $\sin \frac{192\pi}{4} = \sin 48\pi = 0$
 $\sin \frac{193\pi}{4} = \frac{\sqrt{2}}{2}$
 $\sin \frac{194\pi}{4} = \sin \frac{97\pi}{2} = 1$
 $\sin \frac{195\pi}{4} = \frac{\sqrt{2}}{2}$
 $\sin \frac{196\pi}{4} = \sin 49\pi = 0$
 $\sin \frac{197\pi}{4} = -\frac{\sqrt{2}}{2}$
 $\sin \frac{198\pi}{4} = \sin \frac{99\pi}{2} = -1$
 $\sin \frac{199\pi}{4} = -\frac{\sqrt{2}}{2}$
 $\sin \frac{200\pi}{4} = \sin 50\pi = 0$
 $\sin \frac{201\pi}{4} = \frac{\sqrt{2}}{2}$
 $\sin \frac{202\pi}{4} = \sin \frac{101\pi}{2} = 1$
 $\sin \frac{203\pi}{4} = \frac{\sqrt{2}}{2}$
 $\sin \frac{204\pi}{4} = \sin 51\pi = 0$
 $\sin \frac{205\pi}{4} = -\frac{\sqrt{2}}{2}$
 $\sin \frac{206\pi}{4} = \sin \frac{103\pi}{2} = -1$
 $\sin \frac{207\pi}{4} = -\frac{\sqrt{2}}{2}$
 $\sin \frac{208\pi}{4} = \sin 52\pi = 0$
 $\sin \frac{209\pi}{4} = \frac{\sqrt{2}}{2}$
 $\sin \frac{210\pi}{4} = \sin \frac{105\pi}{2} = 1$
 $\sin \frac{211\pi}{4} = \frac{\sqrt{2}}{2}$
 $\sin \frac{212\pi}{4} = \sin 53\pi = 0$
 $\sin \frac{213\pi}{4} = -\frac{\sqrt{2}}{2}$
 $\sin \frac{214\pi}{4} = \sin \frac{107\pi}{2} = -1$
 $\sin \frac{215\pi}{4} = -\frac{\sqrt{2}}{2}$
 $\sin \frac{216\pi}{4} = \sin 54\pi = 0$
 $\sin \frac{217\pi}{4} = \frac{\sqrt{2}}{2}$
 $\sin \frac{218\pi}{4} = \sin \frac{109\pi}{2} = 1$
 $\sin \frac{219\pi}{4} = \frac{\sqrt{2}}{2}$
 $\sin \frac{220\pi}{4} = \sin 55\pi = 0$
 $\sin \frac{221\pi}{4} = -\frac{\sqrt{2}}{2}$
 $\sin \frac{222\pi}{4} = \sin \frac{111\pi}{2} = -1$
 $\sin \frac{223\pi}{4} = -\frac{\sqrt{2}}{2}$
 $\sin \frac{224\pi}{4} = \sin 56\pi = 0$
 $\sin \frac{225\pi}{4} = \frac{\sqrt{2}}{2}$
 $\sin \frac{226\pi}{4} = \sin \frac{113\pi}{2} = 1$
 $\sin \frac{227\pi}{4} = \frac{\sqrt{2}}{2}$
 $\sin \frac{228\pi}{4} = \sin 57\pi = 0$
 $\sin \frac{229\pi}{4} = -\frac{\sqrt{2}}{2}$
 $\sin \frac{230\pi}{4} = \sin \frac{115\pi}{2} = -1$
 $\sin \frac{231\pi}{4} = -\frac{\sqrt{2}}{2}$
 $\sin \frac{232\pi}{4} = \sin 58\pi = 0$
 $\sin \frac{233\pi}{4} = \frac{\sqrt{2}}{2}$
 $\sin \frac{234\pi}{4} = \sin \frac{117\pi}{2} = 1$
 $\sin \frac{235\pi}{4} = \frac{\sqrt{2}}{2}$
 $\sin \frac{236\pi}{4} = \sin 59\pi = 0$
 $\sin \frac{237\pi}{4} = -\frac{\sqrt{2}}{2}$
 $\sin \frac{238\pi}{4} = \sin \frac{119\pi}{2} = -1$
 $\sin \frac{239\pi}{4} = -\frac{\sqrt{2}}{2}$
 $\sin \frac{240\pi}{4} = \sin 60\pi = 0$
 $\sin \frac{241\pi}{4} = \frac{\sqrt{2}}{2}$
 $\sin \frac{242\pi}{4} = \sin \frac{121\pi}{2} = 1$
 $\sin \frac{243\pi}{4} = \frac{\sqrt{2}}{2}$
 $\sin \frac{244\pi}{4} = \sin 61\pi = 0$
 $\sin \frac{245\pi}{4} = -\frac{\sqrt{2}}{2}$
 $\sin \frac{246\pi}{4} = \sin \frac{123\pi}{2} = -1$
 $\sin \frac{247\pi}{4} = -\frac{\sqrt{2}}{2}$
 $\sin \frac{248\pi}{4} = \sin 62\pi = 0$
 $\sin \frac{249\pi}{4} = \frac{\sqrt{2}}{2}$
 $\sin \frac{250\pi}{4} = \sin \frac{125\pi}{2} = 1$
 $\sin \frac{251\pi}{4} = \frac{\sqrt{2}}{2}$
 $\sin \frac{252\pi}{4} = \sin 63\pi = 0$
 $\sin \frac{253\pi}{4} = -\frac{\sqrt{2}}{2}$
 $\sin \frac{254\pi}{4} = \sin \frac{127\pi}{2} = -1$
 $\sin \frac{255\pi}{4} = -\frac{\sqrt{2}}{2}$
 $\sin \frac{256\pi}{4} = \sin 64\pi = 0$
 $\sin \frac{257\pi}{4} = \frac{\sqrt{2}}{2}$
 $\sin \frac{258\pi}{4} = \sin \frac{129\pi}{2} = 1$
 $\sin \frac{259\pi}{4} = \frac{\sqrt{2}}{2}$
 $\sin \frac{260\pi}{4} = \sin 65\pi = 0$
 $\sin \frac{261\pi}{4} = -\frac{\sqrt{2}}{2}$
 $\sin \frac{262\pi}{4} = \sin \frac{131\pi}{2} = -1$
 $\sin \frac{263\pi}{4} = -\frac{\sqrt{2}}{2}$
 $\sin \frac{264\pi}{4} = \sin 66\pi = 0$
 $\sin \frac{265\pi}{4} = \frac{\sqrt{2}}{2}$
 $\sin \frac{266\pi}{4} = \sin \frac{133\pi}{2} = 1$
 $\sin \frac{267\pi}{4} = \frac{\sqrt{2}}{2}$
 $\sin \frac{268\pi}{4} = \sin 67\pi = 0$
 $\sin \frac{269\pi}{4} = -\frac{\sqrt{2}}{2}$
 $\sin \frac{270\pi}{4} = \sin \frac{135\pi}{2} = -1$
 $\sin \frac{271\pi}{4} = -\frac{\sqrt{2}}{2}$
 $\sin \frac{272\pi}{4} = \sin 68\pi = 0$
 $\sin \frac{273\pi}{4} = \frac{\sqrt{2}}{2}$
 $\sin \frac{274\pi}{4} = \sin \frac{137\pi}{2} = 1$
 $\sin \frac{275\pi}{4} = \frac{\sqrt{2}}{2}$
 $\sin \frac{276\pi}{4} = \sin 69\pi = 0$
 $\sin \frac{277\pi}{4} = -\frac{\sqrt{2}}{2}$
 $\sin \frac{278\pi}{4} = \sin \frac{139\pi}{2} = -1$
 $\sin \frac{279\pi}{4} = -\frac{\sqrt{2}}{2}$
 $\sin \frac{280\pi}{4} = \sin 70\pi = 0$
 $\sin \frac{281\pi}{4} = \frac{\sqrt{2}}{2}$
 $\sin \frac{282\pi}{4} = \sin \frac{141\pi}{2} = 1$
 $\sin \frac{283\pi}{4} = \frac{\sqrt{2}}{2}$
 $\sin \frac{284\pi}{4} = \sin 71\pi = 0$
 $\sin \frac{285\pi}{4} = -\frac{\sqrt{2}}{2}$
 $\sin \frac{286\pi}{4} = \sin \frac{143\pi}{2} = -1$
 $\sin \frac{287\pi}{4} = -\frac{\sqrt{2}}{2}$
 $\sin \frac{288\pi}{4} = \sin 72\pi = 0$
 $\sin \frac{289\pi}{4} = \frac{\sqrt{2}}{2}$
 $\sin \frac{290\pi}{4} = \sin \frac{145\pi}{2} = 1$
 $\sin \frac{291\pi}{4} = \frac{\sqrt{2}}{2}$
 $\sin \frac{292\pi}{4} = \sin 73\pi = 0$
 $\sin \frac{293\pi}{4} = -\frac{\sqrt{2}}{2}$
 $\sin \frac{294\pi}{4} = \sin \frac{147\pi}{2} = -1$
 $\sin \frac{295\pi}{4} = -\frac{\sqrt{2}}{2}$

⑧ $A_7 = \{1; 0; 0,707; 0; -0,707; -1\}$ ✓

Hromadné body neexistujú. To znamená, že ~~obsahuje~~ všetky svoje hromadné body a je uzavretá.

~~Najšie každý~~ je bod je izolovaný

⑨ $A_8 = \{0,707; 0; -0,707; -1; 1\}$ ✓

Hromadné body neexistujú. To znamená, že ~~obsahuje~~ všetky svoje hromadné body a je uzavretá. ~~Najšie každý~~ je bod je izolovaný.

✓ $A_1 = \{1, 0,707; 0, -0,707; -1\}$

Hromadné body neexistujú lebo množina A_1 obsahuje všetky svoje hromadné body

JE IZOLOVANÁ!!

✓ $A_2 = \{0,707; 0, -0,707; -1\}$

Hromadné body neexistujú lebo množina A_2 obsahuje všetky svoje hromadné body

(10) ✓ $\{a_n\}_{n=1}^{\infty} = \{0,707; 1; 0,707; 0; -0,707; -1; -0,707; 0; 0,707; 1\}$

$E = \{1; 0,707; 0; -0,707; -1\}$

$\liminf_{n \rightarrow \infty} a_n = -1$

$\limsup_{n \rightarrow \infty} a_n = 1$

$\lim_{n \rightarrow \infty} a_n = \emptyset$

(11) ✓ $\{a_n\}_{n=1}^{\infty} = \{0,707; 0; -0,707; -1; -0,707; 0; 0,707; 1; 0,707; 0\}$

$E = \{0,707; 0; -0,707; -1; 1\}$

$\liminf_{n \rightarrow \infty} a_n = -1$

$\limsup_{n \rightarrow \infty} a_n = 1$

$\lim_{n \rightarrow \infty} a_n = \emptyset$

$A_6 = \mathbb{Q} - \{\frac{2}{3}\}$

✓ Hromadné bod mn. A_6 sú: $\mathbb{R}^* = \left(\text{množina } \mathbb{Q} \text{ nemá HB patrné do } \mathbb{R} \Rightarrow \text{keď by existoval } \mathbb{R} \Rightarrow \text{HB na množine } \mathbb{R}^* = \mathbb{R} \cup \{\pm\infty\} \Rightarrow \text{Opr. kvôľ } \mathbb{R}^* \right)$

Hromadné body množiny \mathbb{Q} sú: **\mathbb{R}^***