

> # $\frac{a}{b} + \frac{b}{c} + \frac{c}{a} = \text{integer}$ $\frac{a}{b} + \frac{b}{a} + \frac{b}{c} + \frac{c}{b} + \frac{c}{a} + \frac{a}{c} = \text{integer}$ by $H \cdot E$:

> $h1c := 0 : h2c := 0 : hc := 0 : h1s := \{ \} : h2s := \{ \} : NPC := 0 : \text{print} () : \text{print} (\{A, B, C\} = [1, 1000])$:for a from 1 to 250 do for b from $a+1$ to 2000 do for c from $b+1$ to 3000 do $hc := hc+1 : h1 := \frac{a}{b} + \frac{b}{c} + \frac{c}{a} : h2 := h1 + \frac{b}{a} + \frac{a}{c} + \frac{c}{b} : \text{if type}(h1, \text{integer})$ and not $\text{type}(\frac{c}{a}, \text{integer})$ and not $\text{type}(\frac{c}{b}, \text{integer})$ then $h1c := h1c+1 : h1s := h1s \text{ union } \{ (\frac{a}{b})_{[0]} + (\frac{b}{c})_{[0]} + (\frac{c}{a})_{[0]} = h1 \}$ fi :if $\text{type}(h2, \text{integer})$ and not $\text{type}(\frac{c}{a}, \text{integer})$ and not $\text{type}(\frac{b}{a}, \text{integer})$ and not $\text{type}(\frac{c}{b}, \text{integer})$ then $h2c := h2c+1 : h2s := h2s \text{ union } \{ (\frac{a}{b})_{[0]} + (\frac{b}{a})_{[0]} + (\frac{b}{c})_{[0]} + (\frac{c}{b})_{[0]} + (\frac{c}{a})_{[0]} + (\frac{a}{c})_{[0]} = h2 \}$ fi : NPC := $nops(h1s) + nops(h2s)$:if NPC > Npc then $\text{print}(A=a, B=b, C=c) : \text{print}(nops(h1s), nops(h2s), Tc=hc)$:for h from 1 to $nops(h1s)$ do $\text{print}(h1s[h])$:od:for h from 1 to $nops(h2s)$ do $\text{print}(h2s[h])$:od: Npc := NPC fi :od:od:od:

$$\{A, B, C\} = [1, 1000]$$

$$A = 2, B = 15, C = 85$$

$$0, 1, Tc = 4031969$$

$$\left(\frac{2}{15}\right)_{\circ} + \left(\frac{15}{2}\right)_{\circ} + \left(\frac{3}{17}\right)_{\circ} + \left(\frac{17}{3}\right)_{\circ} + \left(\frac{85}{2}\right)_{\circ} + \left(\frac{2}{85}\right)_{\circ} = 56$$

$$A = 2, B = 36, C = 81$$

$$1, 1, Tc = 4094419$$

$$\left(\frac{1}{18}\right)_{\circ} + \left(\frac{4}{9}\right)_{\circ} + \left(\frac{81}{2}\right)_{\circ} = 41$$

$$\left(\frac{2}{15}\right)_{\circ} + \left(\frac{15}{2}\right)_{\circ} + \left(\frac{3}{17}\right)_{\circ} + \left(\frac{17}{3}\right)_{\circ} + \left(\frac{85}{2}\right)_{\circ} + \left(\frac{2}{85}\right)_{\circ} = 56$$

$$A = 2, B = 85, C = 493$$

$$1, 2, Tc = 4238842$$

$$\left(\frac{1}{18}\right)_{\circ} + \left(\frac{4}{9}\right)_{\circ} + \left(\frac{81}{2}\right)_{\circ} = 41$$

$$\left(\frac{2}{15}\right)_{\circ} + \left(\frac{15}{2}\right)_{\circ} + \left(\frac{3}{17}\right)_{\circ} + \left(\frac{17}{3}\right)_{\circ} + \left(\frac{85}{2}\right)_{\circ} + \left(\frac{2}{85}\right)_{\circ} = 56$$

$$\left(\frac{2}{85}\right)_{\circ} + \left(\frac{85}{2}\right)_{\circ} + \left(\frac{5}{29}\right)_{\circ} + \left(\frac{29}{5}\right)_{\circ} + \left(\frac{493}{2}\right)_{\circ} + \left(\frac{2}{493}\right)_{\circ} = 295$$

$$A = 2, B = 493, C = 2871$$

$$1, 3, Tc = 5347104$$

$$\left(\frac{1}{18}\right)_{\circ} + \left(\frac{4}{9}\right)_{\circ} + \left(\frac{81}{2}\right)_{\circ} = 41$$

$$\left(\frac{2}{15}\right)_{\circ} + \left(\frac{15}{2}\right)_{\circ} + \left(\frac{3}{17}\right)_{\circ} + \left(\frac{17}{3}\right)_{\circ} + \left(\frac{85}{2}\right)_{\circ} + \left(\frac{2}{85}\right)_{\circ} = 56$$

$$\left(\frac{2}{85}\right)_{\circ} + \left(\frac{85}{2}\right)_{\circ} + \left(\frac{5}{29}\right)_{\circ} + \left(\frac{29}{5}\right)_{\circ} + \left(\frac{493}{2}\right)_{\circ} + \left(\frac{2}{493}\right)_{\circ} = 295$$

$$\left(\frac{2}{493}\right) + \left(\frac{493}{2}\right) + \left(\frac{17}{99}\right) + \left(\frac{99}{17}\right) + \left(\frac{2871}{2}\right) + \left(\frac{2}{2871}\right) = 1688$$

$$A = 3, B = 10, C = 65$$

$$1, 4, Tc = 8007020$$

$$\left(\frac{1}{18}\right) + \left(\frac{4}{9}\right) + \left(\frac{81}{2}\right) = 41$$

$$\left(\frac{2}{15}\right) + \left(\frac{15}{2}\right) + \left(\frac{3}{17}\right) + \left(\frac{17}{3}\right) + \left(\frac{85}{2}\right) + \left(\frac{2}{85}\right) = 56$$

$$\left(\frac{2}{85}\right) + \left(\frac{85}{2}\right) + \left(\frac{5}{29}\right) + \left(\frac{29}{5}\right) + \left(\frac{493}{2}\right) + \left(\frac{2}{493}\right) = 295$$

$$\left(\frac{2}{493}\right) + \left(\frac{493}{2}\right) + \left(\frac{17}{99}\right) + \left(\frac{99}{17}\right) + \left(\frac{2871}{2}\right) + \left(\frac{2}{2871}\right) = 1688$$

$$\left(\frac{3}{10}\right) + \left(\frac{10}{3}\right) + \left(\frac{2}{13}\right) + \left(\frac{13}{2}\right) + \left(\frac{65}{3}\right) + \left(\frac{3}{65}\right) = 32$$

$$A = 3, B = 65, C = 442$$

$$1, 5, Tc = 8170307$$

$$\left(\frac{1}{18}\right) + \left(\frac{4}{9}\right) + \left(\frac{81}{2}\right) = 41$$

$$\left(\frac{2}{15}\right) + \left(\frac{15}{2}\right) + \left(\frac{3}{17}\right) + \left(\frac{17}{3}\right) + \left(\frac{85}{2}\right) + \left(\frac{2}{85}\right) = 56$$

$$\left(\frac{2}{85}\right) + \left(\frac{85}{2}\right) + \left(\frac{5}{29}\right) + \left(\frac{29}{5}\right) + \left(\frac{493}{2}\right) + \left(\frac{2}{493}\right) = 295$$

$$\left(\frac{2}{493}\right) + \left(\frac{493}{2}\right) + \left(\frac{17}{99}\right) + \left(\frac{99}{17}\right) + \left(\frac{2871}{2}\right) + \left(\frac{2}{2871}\right) = 1688$$

$$\left(\frac{3}{10}\right) + \left(\frac{10}{3}\right) + \left(\frac{2}{13}\right) + \left(\frac{13}{2}\right) + \left(\frac{65}{3}\right) + \left(\frac{3}{65}\right) = 32$$

$$\left(\frac{3}{65}\right) + \left(\frac{65}{3}\right) + \left(\frac{5}{34}\right) + \left(\frac{34}{5}\right) + \left(\frac{442}{3}\right) + \left(\frac{3}{442}\right) = 176$$

$$A = 3, B = 126, C = 196$$

$$2, 5, Tc = 8347205$$

$$\left(\frac{1}{18}\right) + \left(\frac{4}{9}\right) + \left(\frac{81}{2}\right) = 41$$

$$\left(\frac{1}{42}\right) + \left(\frac{9}{14}\right) + \left(\frac{196}{3}\right) = 66$$

$$\left(\frac{2}{15}\right) + \left(\frac{15}{2}\right) + \left(\frac{3}{17}\right) + \left(\frac{17}{3}\right) + \left(\frac{85}{2}\right) + \left(\frac{2}{85}\right) = 56$$

$$\left(\frac{2}{85}\right) + \left(\frac{85}{2}\right) + \left(\frac{5}{29}\right) + \left(\frac{29}{5}\right) + \left(\frac{493}{2}\right) + \left(\frac{2}{493}\right) = 295$$

$$\left(\frac{2}{493}\right) + \left(\frac{493}{2}\right) + \left(\frac{17}{99}\right) + \left(\frac{99}{17}\right) + \left(\frac{2871}{2}\right) + \left(\frac{2}{2871}\right) = 1688$$

$$\left(\frac{3}{10}\right) + \left(\frac{10}{3}\right) + \left(\frac{2}{13}\right) + \left(\frac{13}{2}\right) + \left(\frac{65}{3}\right) + \left(\frac{3}{65}\right) = 32$$

$$\left(\frac{3}{65}\right) + \left(\frac{65}{3}\right) + \left(\frac{5}{34}\right) + \left(\frac{34}{5}\right) + \left(\frac{442}{3}\right) + \left(\frac{3}{442}\right) = 176$$

$$A = 10, B = 77, C = 165$$

$$2, 6, Tc = 36051382$$

$$\left(\frac{1}{18}\right) + \left(\frac{4}{9}\right) + \left(\frac{81}{2}\right) = 41$$

$$\left(\frac{1}{42}\right) + \left(\frac{9}{14}\right) + \left(\frac{196}{3}\right) = 66$$

$$\left(\frac{2}{15}\right) + \left(\frac{15}{2}\right) + \left(\frac{3}{17}\right) + \left(\frac{17}{3}\right) + \left(\frac{85}{2}\right) + \left(\frac{2}{85}\right) = 56$$

$$\left(\frac{2}{85}\right) + \left(\frac{85}{2}\right) + \left(\frac{5}{29}\right) + \left(\frac{29}{5}\right) + \left(\frac{493}{2}\right) + \left(\frac{2}{493}\right) = 295$$

$$\left(\frac{2}{493}\right) + \left(\frac{493}{2}\right) + \left(\frac{17}{99}\right) + \left(\frac{99}{17}\right) + \left(\frac{2871}{2}\right) + \left(\frac{2}{2871}\right) = 1688$$

$$\left(\frac{3}{10}\right) + \left(\frac{10}{3}\right) + \left(\frac{2}{13}\right) + \left(\frac{13}{2}\right) + \left(\frac{65}{3}\right) + \left(\frac{3}{65}\right) = 32$$

$$\left(\frac{3}{65}\right) + \left(\frac{65}{3}\right) + \left(\frac{5}{34}\right) + \left(\frac{34}{5}\right) + \left(\frac{442}{3}\right) + \left(\frac{3}{442}\right) = 176$$

$$\left(\frac{10}{77}\right) + \left(\frac{77}{10}\right) + \left(\frac{7}{15}\right) + \left(\frac{15}{7}\right) + \left(\frac{33}{2}\right) + \left(\frac{2}{33}\right) = 27$$

$$A = 12, B = 63, C = 98$$

$$3, 6, Tc = 43939446$$

$$\left(\frac{1}{18}\right) + \left(\frac{4}{9}\right) + \left(\frac{81}{2}\right) = 41$$

$$\left(\frac{1}{42}\right) + \left(\frac{9}{14}\right) + \left(\frac{196}{3}\right) = 66$$

$$\left(\frac{4}{21}\right) + \left(\frac{9}{14}\right) + \left(\frac{49}{6}\right) = 9$$

$$\left(\frac{2}{15}\right) + \left(\frac{15}{2}\right) + \left(\frac{3}{17}\right) + \left(\frac{17}{3}\right) + \left(\frac{85}{2}\right) + \left(\frac{2}{85}\right) = 56$$

$$\left(\frac{2}{85}\right) + \left(\frac{85}{2}\right) + \left(\frac{5}{29}\right) + \left(\frac{29}{5}\right) + \left(\frac{493}{2}\right) + \left(\frac{2}{493}\right) = 295$$

$$\left(\frac{2}{493}\right) + \left(\frac{493}{2}\right) + \left(\frac{17}{99}\right) + \left(\frac{99}{17}\right) + \left(\frac{2871}{2}\right) + \left(\frac{2}{2871}\right) = 1688$$

$$\left(\frac{3}{10}\right) + \left(\frac{10}{3}\right) + \left(\frac{2}{13}\right) + \left(\frac{13}{2}\right) + \left(\frac{65}{3}\right) + \left(\frac{3}{65}\right) = 32$$

$$\left(\frac{3}{65}\right) + \left(\frac{65}{3}\right) + \left(\frac{5}{34}\right) + \left(\frac{34}{5}\right) + \left(\frac{442}{3}\right) + \left(\frac{3}{442}\right) = 176$$

$$\left(\frac{10}{77}\right) + \left(\frac{77}{10}\right) + \left(\frac{7}{15}\right) + \left(\frac{15}{7}\right) + \left(\frac{33}{2}\right) + \left(\frac{2}{33}\right) = 27$$

$$A = 28, B = 1323, C = 1458$$

$$4, 6, Tc = 109850692$$

$$\left(\frac{1}{18}\right) + \left(\frac{4}{9}\right) + \left(\frac{81}{2}\right) = 41$$

$$\left(\frac{1}{42}\right) + \left(\frac{9}{14}\right) + \left(\frac{196}{3}\right) = 66$$

$$\left(\frac{4}{21}\right) + \left(\frac{9}{14}\right) + \left(\frac{49}{6}\right) = 9$$

$$\left(\frac{4}{189}\right) + \left(\frac{49}{54}\right) + \left(\frac{729}{14}\right) = 53$$

$$\left(\frac{2}{15}\right) + \left(\frac{15}{2}\right) + \left(\frac{3}{17}\right) + \left(\frac{17}{3}\right) + \left(\frac{85}{2}\right) + \left(\frac{2}{85}\right) = 56$$

$$\left(\frac{2}{85}\right) + \left(\frac{85}{2}\right) + \left(\frac{5}{29}\right) + \left(\frac{29}{5}\right) + \left(\frac{493}{2}\right) + \left(\frac{2}{493}\right) = 295$$

$$\left(\frac{2}{493}\right) + \left(\frac{493}{2}\right) + \left(\frac{17}{99}\right) + \left(\frac{99}{17}\right) + \left(\frac{2871}{2}\right) + \left(\frac{2}{2871}\right) = 1688$$

$$\left(\frac{3}{10}\right) + \left(\frac{10}{3}\right) + \left(\frac{2}{13}\right) + \left(\frac{13}{2}\right) + \left(\frac{65}{3}\right) + \left(\frac{3}{65}\right) = 32$$

$$\left(\frac{3}{65}\right) + \left(\frac{65}{3}\right) + \left(\frac{5}{34}\right) + \left(\frac{34}{5}\right) + \left(\frac{442}{3}\right) + \left(\frac{3}{442}\right) = 176$$

$$\left(\frac{10}{77}\right) + \left(\frac{77}{10}\right) + \left(\frac{7}{15}\right) + \left(\frac{15}{7}\right) + \left(\frac{33}{2}\right) + \left(\frac{2}{33}\right) = 27$$

$$A = 55, B = 595, C = 2002$$

$$4, 7, Tc = 212961952$$

$$\left(\frac{1}{18}\right) + \left(\frac{4}{9}\right) + \left(\frac{81}{2}\right) = 41$$

$$\left(\frac{1}{42}\right) + \left(\frac{9}{14}\right) + \left(\frac{196}{3}\right) = 66$$

$$\left(\frac{4}{21}\right) + \left(\frac{9}{14}\right) + \left(\frac{49}{6}\right) = 9$$

$$\left(\frac{4}{189}\right) + \left(\frac{49}{54}\right) + \left(\frac{729}{14}\right) = 53$$

$$\left(\frac{2}{15}\right) + \left(\frac{15}{2}\right) + \left(\frac{3}{17}\right) + \left(\frac{17}{3}\right) + \left(\frac{85}{2}\right) + \left(\frac{2}{85}\right) = 56$$

$$\left(\frac{2}{85}\right) + \left(\frac{85}{2}\right) + \left(\frac{5}{29}\right) + \left(\frac{29}{5}\right) + \left(\frac{493}{2}\right) + \left(\frac{2}{493}\right) = 295$$

$$\left(\frac{2}{493}\right) + \left(\frac{493}{2}\right) + \left(\frac{17}{99}\right) + \left(\frac{99}{17}\right) + \left(\frac{2871}{2}\right) + \left(\frac{2}{2871}\right) = 1688$$

$$\left(\frac{3}{10}\right) + \left(\frac{10}{3}\right) + \left(\frac{2}{13}\right) + \left(\frac{13}{2}\right) + \left(\frac{65}{3}\right) + \left(\frac{3}{65}\right) = 32$$

$$\left(\frac{3}{65}\right) + \left(\frac{65}{3}\right) + \left(\frac{5}{34}\right) + \left(\frac{34}{5}\right) + \left(\frac{442}{3}\right) + \left(\frac{3}{442}\right) = 176$$

$$\left(\frac{10}{77}\right) + \left(\frac{77}{10}\right) + \left(\frac{7}{15}\right) + \left(\frac{15}{7}\right) + \left(\frac{33}{2}\right) + \left(\frac{2}{33}\right) = 27$$

$$\left(\frac{11}{119}\right) + \left(\frac{119}{11}\right) + \left(\frac{85}{286}\right) + \left(\frac{286}{85}\right) + \left(\frac{182}{5}\right) + \left(\frac{5}{182}\right) = 51$$

$$A = 90, B = 391, C = 2210$$

$$4, 8, Tc = 344847154$$

$$\left(\frac{1}{18}\right) + \left(\frac{4}{9}\right) + \left(\frac{81}{2}\right) = 41$$

$$\left(\frac{1}{42}\right) + \left(\frac{9}{14}\right) + \left(\frac{196}{3}\right) = 66$$

$$\left(\frac{4}{21}\right) + \left(\frac{9}{14}\right) + \left(\frac{49}{6}\right) = 9$$

$$\left(\frac{4}{189}\right) + \left(\frac{49}{54}\right) + \left(\frac{729}{14}\right) = 53$$

$$\left(\frac{2}{15}\right) + \left(\frac{15}{2}\right) + \left(\frac{3}{17}\right) + \left(\frac{17}{3}\right) + \left(\frac{85}{2}\right) + \left(\frac{2}{85}\right) = 56$$

$$\left(\frac{2}{85}\right) + \left(\frac{85}{2}\right) + \left(\frac{5}{29}\right) + \left(\frac{29}{5}\right) + \left(\frac{493}{2}\right) + \left(\frac{2}{493}\right) = 295$$

$$\left(\frac{2}{493}\right) + \left(\frac{493}{2}\right) + \left(\frac{17}{99}\right) + \left(\frac{99}{17}\right) + \left(\frac{2871}{2}\right) + \left(\frac{2}{2871}\right) = 1688$$

$$\left(\frac{3}{10}\right) + \left(\frac{10}{3}\right) + \left(\frac{2}{13}\right) + \left(\frac{13}{2}\right) + \left(\frac{65}{3}\right) + \left(\frac{3}{65}\right) = 32$$

$$\left(\frac{3}{65}\right) + \left(\frac{65}{3}\right) + \left(\frac{5}{34}\right) + \left(\frac{34}{5}\right) + \left(\frac{442}{3}\right) + \left(\frac{3}{442}\right) = 176$$

$$\left(\frac{10}{77}\right) + \left(\frac{77}{10}\right) + \left(\frac{7}{15}\right) + \left(\frac{15}{7}\right) + \left(\frac{33}{2}\right) + \left(\frac{2}{33}\right) = 27$$

$$\left(\frac{11}{119}\right) + \left(\frac{119}{11}\right) + \left(\frac{85}{286}\right) + \left(\frac{286}{85}\right) + \left(\frac{182}{5}\right) + \left(\frac{5}{182}\right) = 51$$

$$\left(\frac{90}{391}\right) + \left(\frac{391}{90}\right) + \left(\frac{23}{130}\right) + \left(\frac{130}{23}\right) + \left(\frac{221}{9}\right) + \left(\frac{9}{221}\right) = 35$$

$$A = 175, B = 882, C = 1620$$

$$5, 8, Tc = 652789817$$

$$\left(\frac{1}{18}\right) + \left(\frac{4}{9}\right) + \left(\frac{81}{2}\right) = 41$$

$$\left(\frac{1}{42}\right) + \left(\frac{9}{14}\right) + \left(\frac{196}{3}\right) = 66$$

$$\left(\frac{4}{21}\right) + \left(\frac{9}{14}\right) + \left(\frac{49}{6}\right) = 9$$

$$\left(\frac{4}{189}\right) + \left(\frac{49}{54}\right) + \left(\frac{729}{14}\right) = 53$$

$$\left(\frac{25}{126}\right) + \left(\frac{49}{90}\right) + \left(\frac{324}{35}\right) = 10$$

$$\left(\frac{2}{15}\right) + \left(\frac{15}{2}\right) + \left(\frac{3}{17}\right) + \left(\frac{17}{3}\right) + \left(\frac{85}{2}\right) + \left(\frac{2}{85}\right) = 56$$

$$\left(\frac{2}{85}\right) + \left(\frac{85}{2}\right) + \left(\frac{5}{29}\right) + \left(\frac{29}{5}\right) + \left(\frac{493}{2}\right) + \left(\frac{2}{493}\right) = 295$$

$$\left(\frac{2}{493}\right) + \left(\frac{493}{2}\right) + \left(\frac{17}{99}\right) + \left(\frac{99}{17}\right) + \left(\frac{2871}{2}\right) + \left(\frac{2}{2871}\right) = 1688$$

$$\left(\frac{3}{10}\right) + \left(\frac{10}{3}\right) + \left(\frac{2}{13}\right) + \left(\frac{13}{2}\right) + \left(\frac{65}{3}\right) + \left(\frac{3}{65}\right) = 32$$

$$\left(\frac{3}{65}\right) + \left(\frac{65}{3}\right) + \left(\frac{5}{34}\right) + \left(\frac{34}{5}\right) + \left(\frac{442}{3}\right) + \left(\frac{3}{442}\right) = 176$$

$$\left(\frac{10}{77}\right) + \left(\frac{77}{10}\right) + \left(\frac{7}{15}\right) + \left(\frac{15}{7}\right) + \left(\frac{33}{2}\right) + \left(\frac{2}{33}\right) = 27$$

$$\left(\frac{11}{119}\right) + \left(\frac{119}{11}\right) + \left(\frac{85}{286}\right) + \left(\frac{286}{85}\right) + \left(\frac{182}{5}\right) + \left(\frac{5}{182}\right) = 51$$

$$\left(\frac{90}{391}\right) + \left(\frac{391}{90}\right) + \left(\frac{23}{130}\right) + \left(\frac{130}{23}\right) + \left(\frac{221}{9}\right) + \left(\frac{9}{221}\right) = 35$$

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