

$$\left\{ \begin{array}{l} x^4 + y^4 = 17 \\ xy = 2 \end{array} \right. \Rightarrow \left\{ \begin{array}{l} x^4 + \left(\frac{2}{x} \right)^4 = 17 \\ y = \frac{2}{x} \end{array} \right.$$

решаем вспомогательное уравнение

$$x^4 + \left(\frac{2}{x} \right)^4 = 17$$

$$x^4 + \frac{16}{x^4} - 17 = 0$$

заменим переменную: $\frac{16}{x^4} = a$

$$\frac{16}{a} + a - 17 = 0$$

$$\frac{16 + a(a - 17)}{a} = 0$$

$$\frac{16 + a^2 - 17a}{a} = 0$$

дробь обращается в ноль, если числитель равен нулю

$$a^2 - 17a + 16 = 0$$

$$D = (-17)^2 - 4 \cdot 1 \cdot 16 = 289 - 64 = 225$$

$$a_1 = \frac{17 + 15}{2} = 16$$

$$a_2 = \frac{17 - 15}{2} = 1$$

$$\left\{ \begin{array}{l} \left\{ \begin{array}{l} \frac{16}{x^4} = 16 \\ y = \frac{2}{x} \end{array} \right. \\ \left\{ \begin{array}{l} \frac{16}{x^4} = 1 \\ y = \frac{2}{x} \end{array} \right. \end{array} \right.$$

Случай 1

$$\left\{ \begin{array}{l} \frac{16}{x^4} = 16 \\ y = \frac{2}{x} \end{array} \right\} \Rightarrow \left\{ \begin{array}{l} 16x^4 = 16 \\ y = \frac{2}{x} \end{array} \right\} \Rightarrow \left\{ \begin{array}{l} x^4 = \frac{16}{16} \\ y = \frac{2}{x} \end{array} \right\} \Rightarrow \left\{ \begin{array}{l} x=1 \\ y=2 \\ x=-1 \\ y=-2 \end{array} \right\}$$

Случай 2

$$\left\{ \begin{array}{l} \frac{16}{x^4} = 1 \\ y = \frac{2}{x} \end{array} \right\} \Rightarrow \left\{ \begin{array}{l} x^4 = 16 \\ y = \frac{2}{x} \end{array} \right\} \Rightarrow \left\{ \begin{array}{l} x=2 \\ y=1 \\ x=-2 \\ y=-1 \end{array} \right\}$$

Ответ: $(x=1, y=2); (x=-1, y=-2); (x=2, y=1); (x=-2, y=-1)$