

$$(6\sin^2x - \sin x - 1)(a\sin x + 3a - 2) = 0$$

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$$6\sin^2x - \sin x - 1 = 0$$

$$(2\sin x - 1)(3\sin x + 1) = 0$$

$$\sin x = \frac{1}{2}$$

$$\text{принимая } x = \frac{\pi}{6} + 2\pi k$$

$$x = \frac{5\pi}{6} + 2\pi k$$

$$\sin x = -\frac{1}{3}$$

$$x = \arcsin\left(-\frac{1}{3}\right) + 2\pi k$$

$$a\sin x + 3a - 2 = 0$$

$$\sin x = \frac{2-3a}{a}$$

$$\frac{1}{2} < \frac{2-3a}{a} \leq 1$$

$$\frac{a+4-6a}{2a} > 0$$

$$\frac{-5a+4}{2a} > 0$$

$$\frac{1}{0} \quad \frac{1}{\frac{4}{5}}$$

$$\left\{ 0 < a < \frac{4}{5} \right\}$$

$$\frac{2-3a-a}{a} = 0$$

$$\frac{2-4a}{a} \leq 0$$

$$\frac{1}{0} \quad \frac{1}{\frac{1}{2}}$$

$$a < 0 \text{ или } a > \frac{1}{2}$$

$$\left\{ \frac{1}{2} < a < \frac{4}{5} \right\}$$

$$a \neq \frac{4}{5} \Leftrightarrow \sin x \neq \frac{1}{2}$$

$$a \neq \frac{3}{4} \Leftrightarrow \sin x \neq \frac{1}{3}$$

ответ: $\left\{ 0 < a < \frac{4}{5} \right\}$