

$$x^2 \operatorname{tg}^2 y (\operatorname{tg}^2 y - 2) = 1 - 2x$$

$$\operatorname{arctg}(x \operatorname{tgy}) = 2y$$

пусть $x \operatorname{tgy} = a$
 $2y = b$
 $b \in (-\pi/2; \pi/2)$
 $\operatorname{arctg} a = b$
 $a = \operatorname{tgb}$

$$x \operatorname{tgy} = \operatorname{tg} 2y$$

$$(1 - \operatorname{tg}^2 2y (\operatorname{tg}^2 y - 2)) / 2 = x$$

$$(1 - \operatorname{tg}^2 2y (\operatorname{tg}^2 y - 2)) / 2 * \operatorname{tgy} = \operatorname{tg} 2y$$

$$\operatorname{tg} 2y = \sin 2y / \cos 2y = (2 \sin y \cos y) / (\cos^2 y - \sin^2 y) = (2 \operatorname{tgy}) / (1 - \operatorname{tg}^2 y)$$

$$\operatorname{tgy} ((1 - \operatorname{tg}^2 2y (\operatorname{tg}^2 y - 2)) / 2) - 2 / (1 - \operatorname{tg}^2 y) = 0$$

$$\operatorname{tgy} = 0$$

$y = \pi k$ --- подходит про $k=0$ по ОДЗ
 $x = 1/2$

1 СПОСОБ

$$(1 - (4 \operatorname{tg}^2 y) / (1 - \operatorname{tg}^2 y)^2 * (\operatorname{tg}^2 y - 2)) / 2 - 2 / (1 - \operatorname{tg}^2 y) = 0$$

$$\operatorname{tgy} = k$$

$$1 - (k^2 - 2) * 4k^2 / (1 - k^2)^2 - 4 / (1 - k^2) = 0$$

$$[(1 - k^2)^2 - 4k^2(k^2 - 2) - 4(1 - k^2)] / (1 - k^2)^2 = 0$$

$x = 3$
 $\operatorname{tg}^2 y = 1/3$
 $\operatorname{tg} y = \pm 1/\sqrt{3}$
 $y = \pi/6 + \pi k$
 $y = -\pi/6 + \pi k$
 подходят без πk

$x = -1$
 $\operatorname{tg}^2 y = 3$
 $\operatorname{tg} y = \pm \sqrt{3}$
 $y = \pi/3 + \pi k$
 $y = -\pi/3 + \pi k$
 решений нет по ОДЗ

$$[1 - 2k^2 + k^4 - 4k^4 + 8k^2 - 4 + 4k^2] / (1 - k^2)^2 = 0$$

$$[-3 - 3k^4 + 10k^2] / (1 - k^2)^2 = 0$$

$$k^2 = h$$

$$k \neq 1; -1$$

$$-3 - 3h^2 + 10h = 0$$

$$3h^2 - 10h + 3 = 0$$

$$D = 100 - 36 = 64 = 8^2$$

$$h = (10 - 8) / 6 = 1/3$$

$$h = (10 + 8) / 6 = 3$$

2 СПОСОБ

$$x - 2 / (1 - \operatorname{tg}^2 y) = 0$$

$$2 / (1 - \operatorname{tg}^2 y) = x$$

$$2/x = 1 - \operatorname{tg}^2 y$$

$$\operatorname{tg}^2 y = 1 - 2/x$$

$$\operatorname{tg}^2 y = (x - 2) / x$$

$$x^2 * (x - 2) / x * ((x - 2) / x - 2) = 1 - 2x$$

$$x^2 * (x - 2)^2 / x^2 - 2x^2 * (x - 2) / x = 1 - 2x$$

$$(x^2 * (x - 2)^2 - 2x^3 * (x - 2) - x^2 + 2x^3) / x^2 = 0$$

$$x^2((x - 2)^2 - 2x(x - 2) - 1 + 2x) / x^2 = 0$$

$$x^2 - 4x + 4 - 2x^2 + 4x - 1 + 2x = 0$$

$$x^2 - 2x - 3 = 0$$

$$x = 3; -1$$

$$\operatorname{tg}^2 y = (3 - 2) / 3 = 1/3$$

$$\operatorname{tg}^2 y = 3$$

ОДЗ

$$-\pi/2 < 2y < \pi/2$$

$$-\pi/4 < y < \pi/4$$

ОТВЕТ

$$(3; \pi/6); (3; -\pi/6);$$

$$(1/2; 0)$$

