



数学I

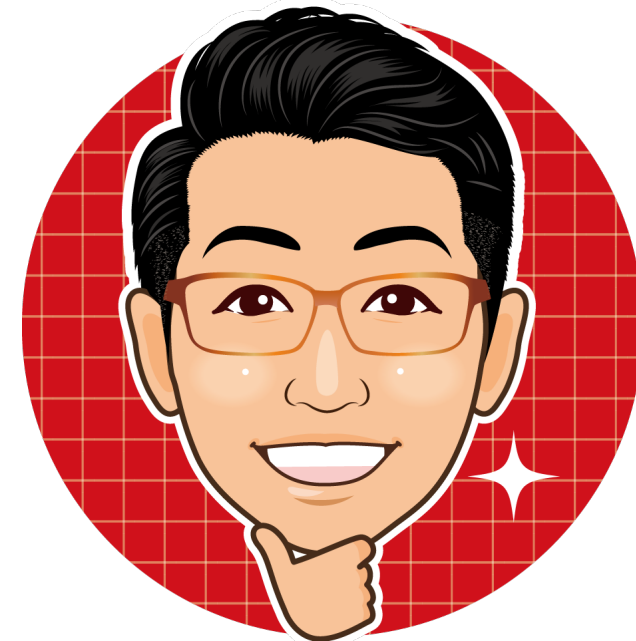
第3章 2次関数

2次関数と直線



$y = ax^2 + bx + c$ と $y = mx + n$ の 共有点

$\Leftrightarrow ax^2 + bx + c = mx + n$ の 解



$D > 0$ のとき 解は 2 個

(ex) $y = x^2 - 4x + 5$, $y = x + 1$ の 共有点

解法. $(x-4)(x-1) = 0$

$$x^2 - 4x + 5 = x + 1$$

$$D = (-5)^2 - 4 \cdot 4$$

$$x = 4, 1$$

$$x = 4 \text{ のとき } y = 4 + 1 = 5$$

$$x^2 - 5x + 4 = 0$$

$$= 25 - 16$$

$$x = 1 \text{ のとき } y = 1 + 1 = 2$$

$$= 9 > 0$$

$$y = 2$$

の 判別式 $D > 0$

$(1, 2), (4, 5)$

(2x) $y = x^2$, $y = 2x + k$

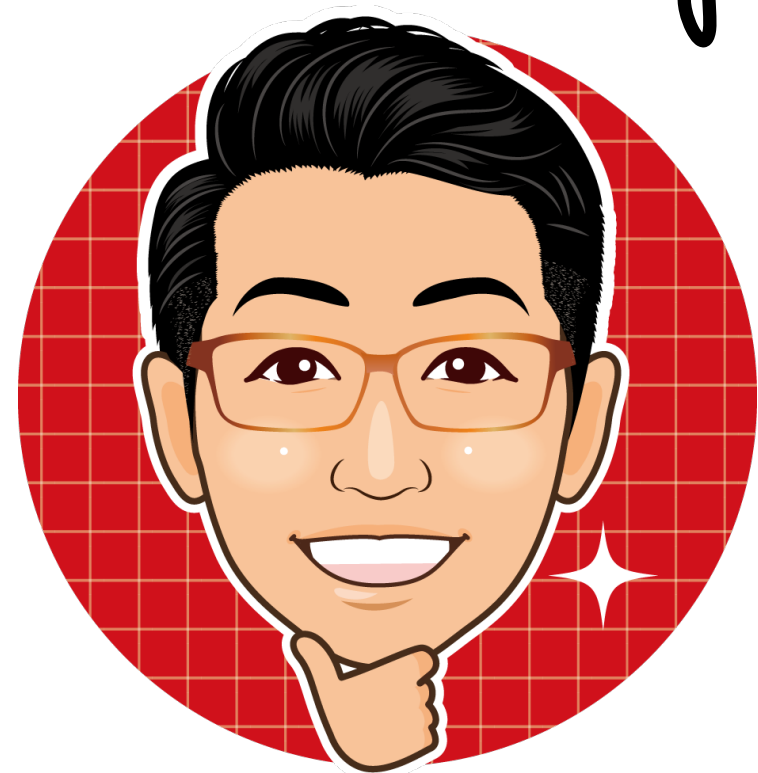
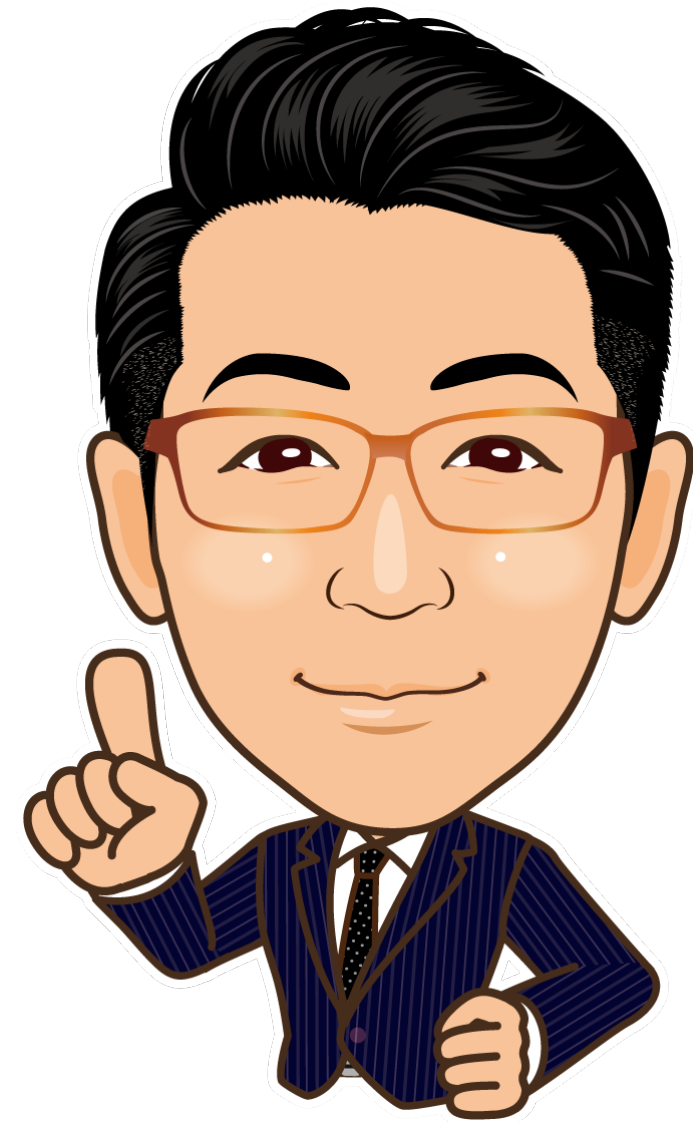
$x^2 = 2x + k$

$x^2 - 2x - k = 0$ ①

判別式 $D \geq 0$

$\frac{D}{4} = (-1)^2 - 1(-k)$

$= k + 1$



(i) $\frac{D}{4} > 0$

$k + 1 > 0$

$k > -1$

(ii) $\frac{D}{4} = 0$

$k = -1$

(iii) $\frac{D}{4} < 0$

$k + 1 < 0$

$k < -1$

(i), (ii), (iii) ②

$k > -1$ $x \geq 2$ 2個

$k = -1$ $x \geq 2$ 1個

$k < -1$ $x \geq 2$ 0個

③ $k = -1$ $x \geq 2$

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

$(x - 1)^2 = 0$, $x = 1$.

$x = 1$ $y = 1$

④

(1, 1)