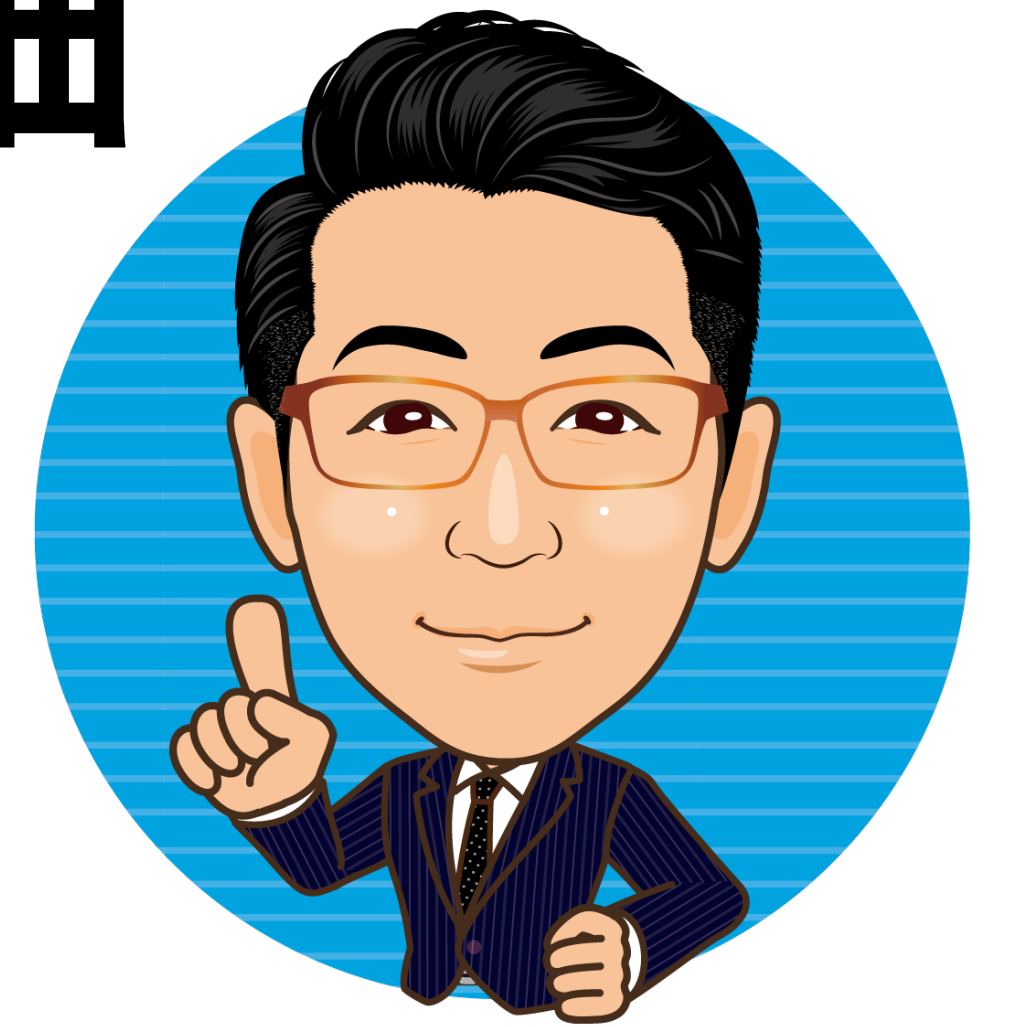




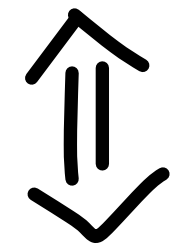
# 数学I

## 第3章 2次関数

### 2次関数のグラフとx軸



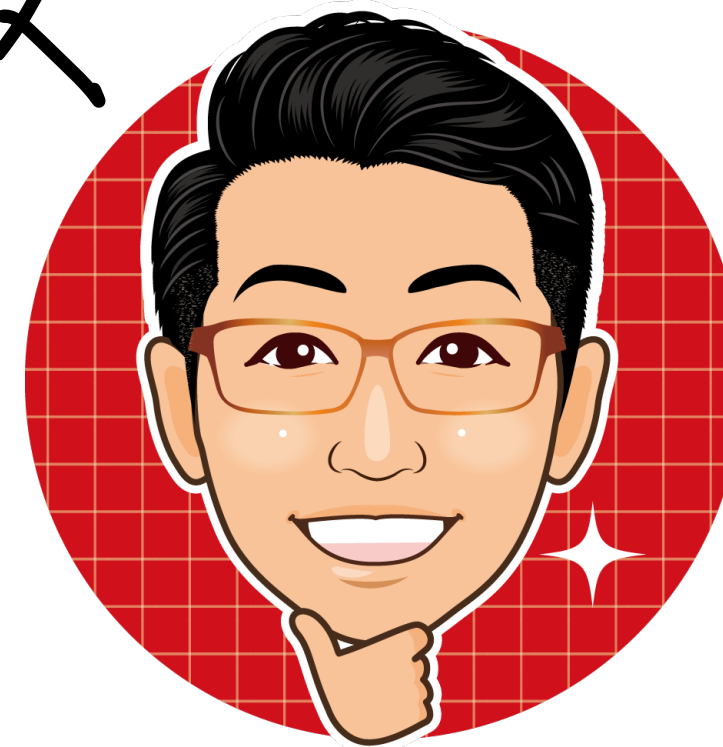
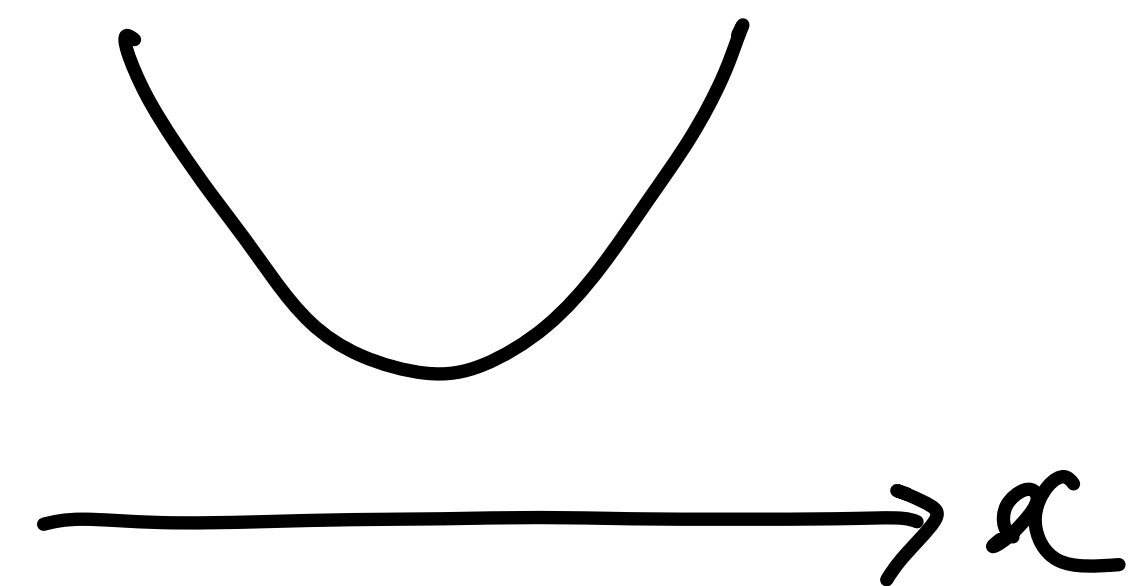
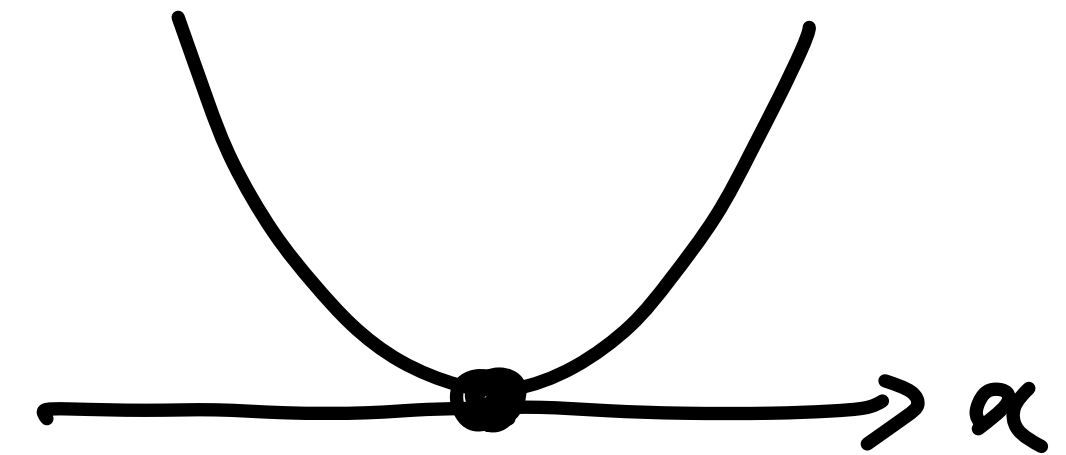
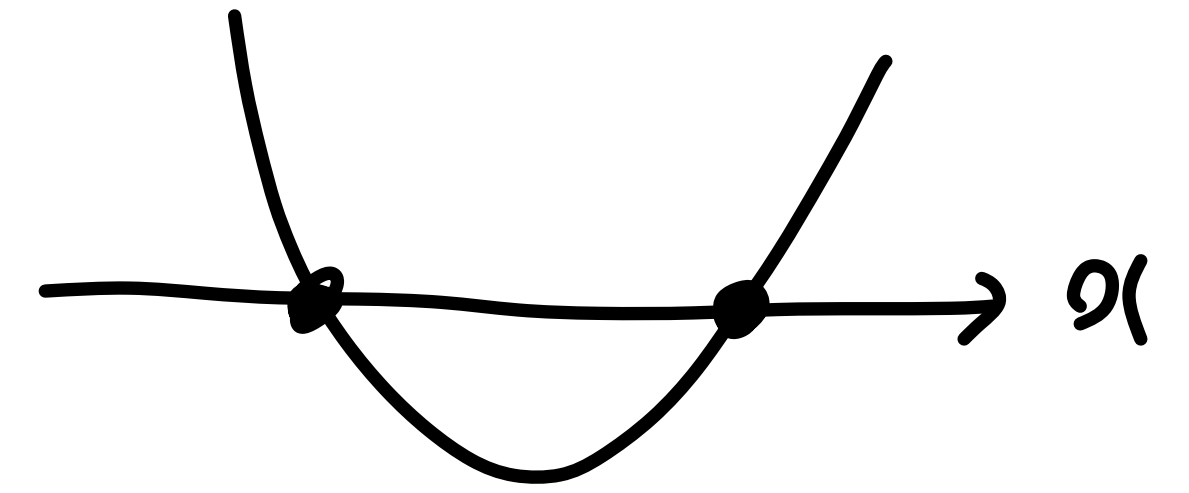
$y = ax^2 + bx + c$  と  $x$  軸の位置関係



$y = ax^2 + bx + c$  と  $y = 0$  の交点の個数



$ax^2 + bx + c = 0$  の実数解の個数



(例)  $y = x^2 - 4x + 1$  と  $x$  軸の共有点...

$y=0$  と代入

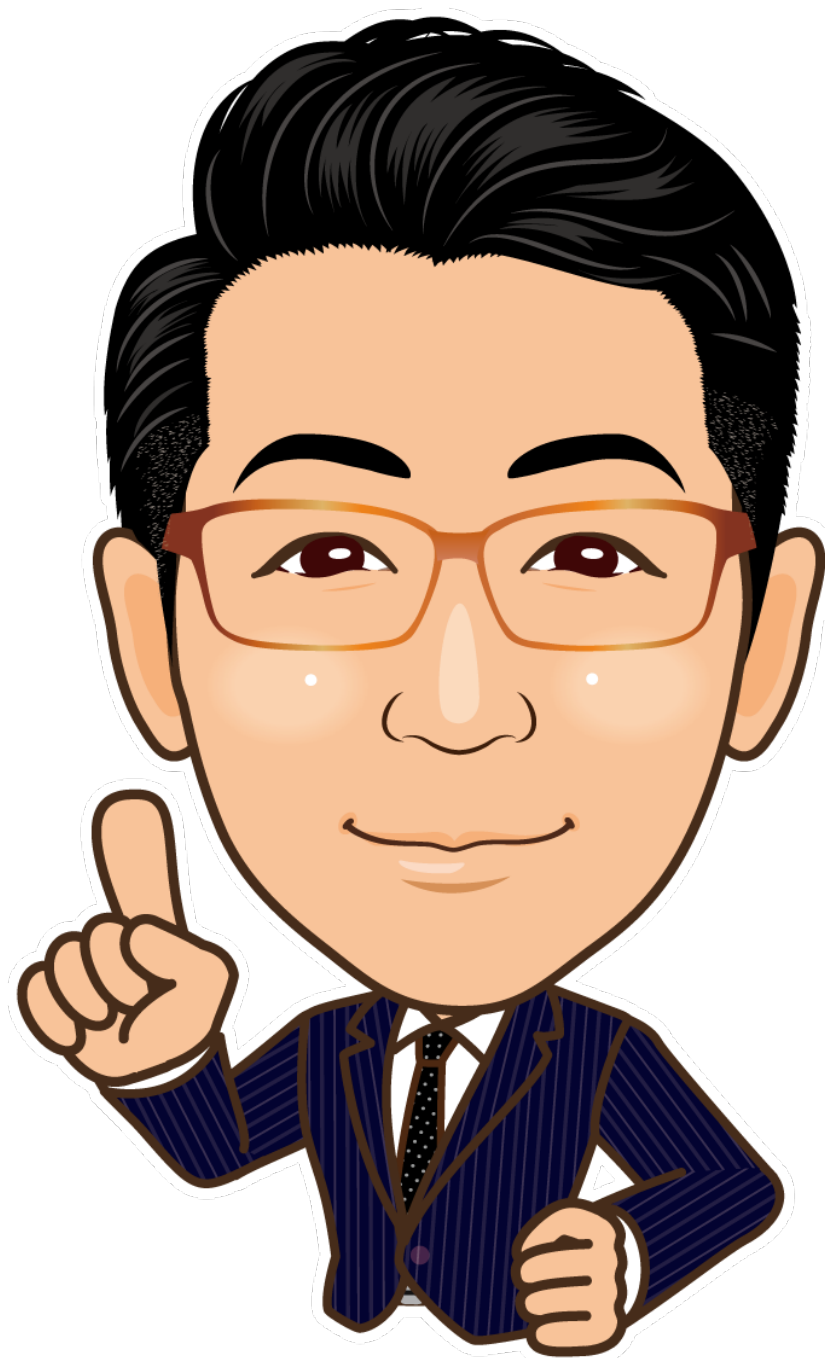
$$x^2 - 4x + 1 = 0$$

$$x = \frac{2 \pm \sqrt{2^2 - 1}}{1}$$

$$x = 2 \pm \sqrt{3}$$

$$(2 + \sqrt{3}, 0), (2 - \sqrt{3}, 0)$$

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(例)  $y = x^2 + 3x + 3$  と

$x$  軸の共有点の個数

$y=0$  と代入

$x^2 + 3x + 3 = 0$  の判別式  $D = b^2 - 4ac$

$$D = 3^2 - 4 \cdot 1 \cdot 3 = 9 - 12 = -3 < 0$$

$D < 0$  より、実数解 0 個

つまり、共有点 0 個

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(ex)  $y = -x^2 + 4x + m$  与  $x$  轴, 共有几个交点

(i)  $D > 0$   
 $m + 4 > 0$   
 $m > -4$

(ii)  $D = 0$   
 $m = -4$

(iii)  $D < 0$   
 $m + 4 < 0$   
 $m < -4$

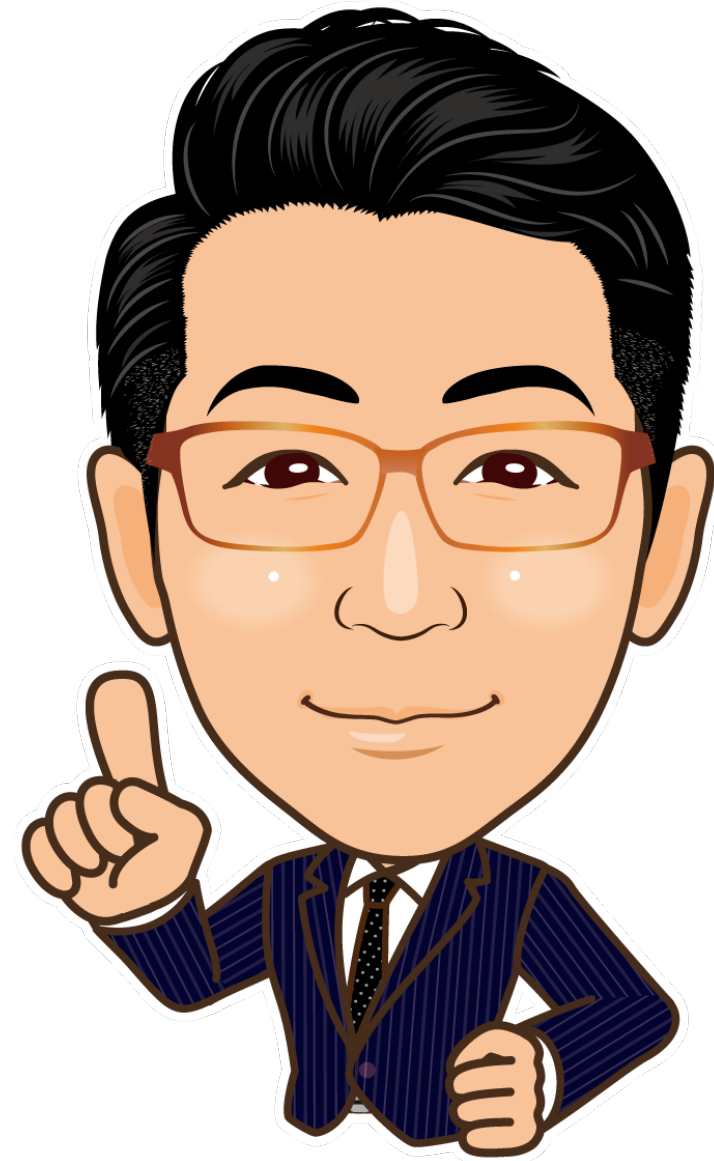
$y = 0$  代入

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

$$x^2 - 4x - m = 0$$

判别式  $D = b^2 - 4ac$

$$D = (-4)^2 - 4 \cdot 1 \cdot (-m) = 16 + 4m$$



(i), (ii), (iii) 时

$m > -4$  有两个交点

$m = -4$  有一个交点

$m < -4$  没有交点