

# The Discriminant - Solutions of Quadratic Equations



## Overview of problems



Example Set: A

Find the value of the discriminant

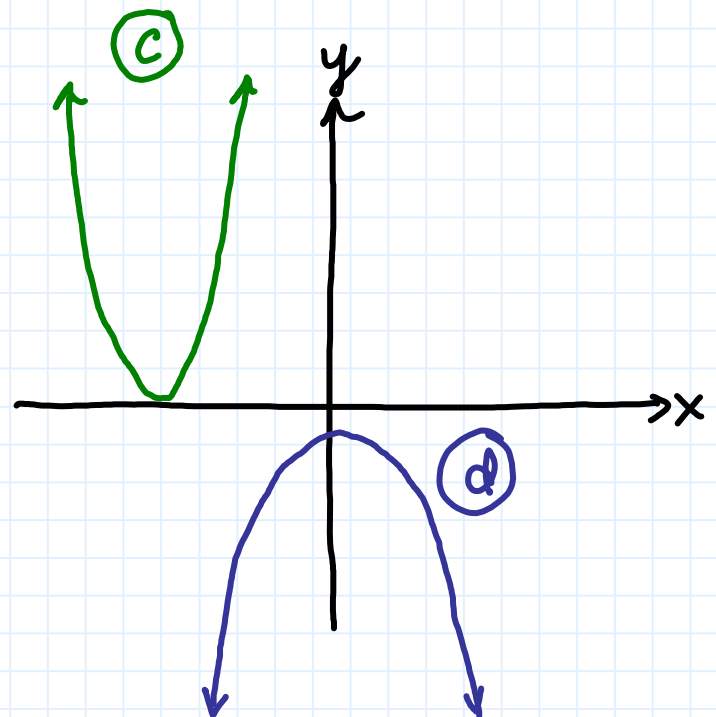
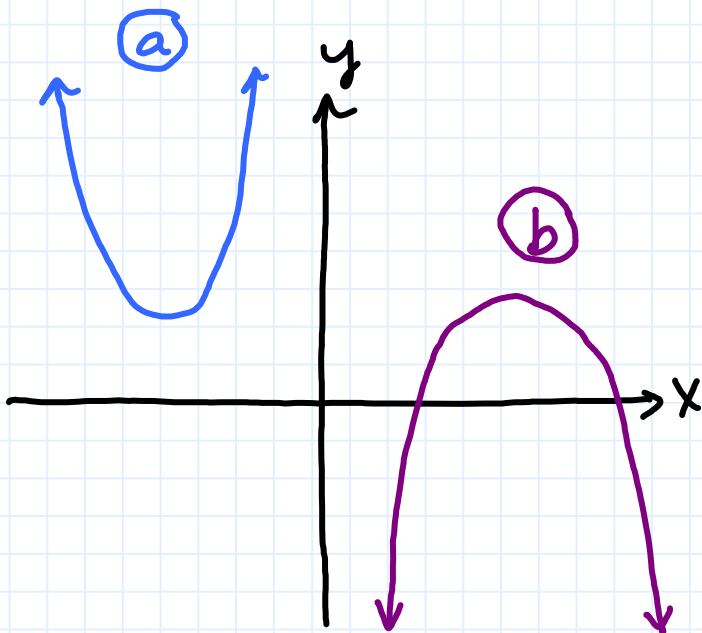
$$4x^2 - 2x + 3 = 0$$

$$3x - 5x^2 = 8$$

$$9x^2 + x + 2 = 0$$

$$x^2 - 6x = -9$$

Use the graph to determine the nature of the roots





## Example Set: B

Use the discriminant to determine the type of solutions

$$-2x^2 - 3x - 7 = 0$$

$$4y - y^2 = 1$$

$$t^2 - 10t + 25 = 0$$

$$3z^2 + 8z + 1 = 0$$



## Example Set: C

Determine the value of  $k$  for which the equation will have the indicated roots.

$$4x^2 - 3x + k = 0 \quad \text{TWO REAL NUMBERS}$$

$$ky^2 + y - 9 = 0 \quad \text{TWO IMAGINARY NUMBERS}$$

$$x^2 = -4kx - 1 \quad \text{DOUBLE REAL}$$

# The Discriminant - Solutions of Quadratic Equations



## Overview of problems- KEY



Example Set: A

Find the value of the discriminant

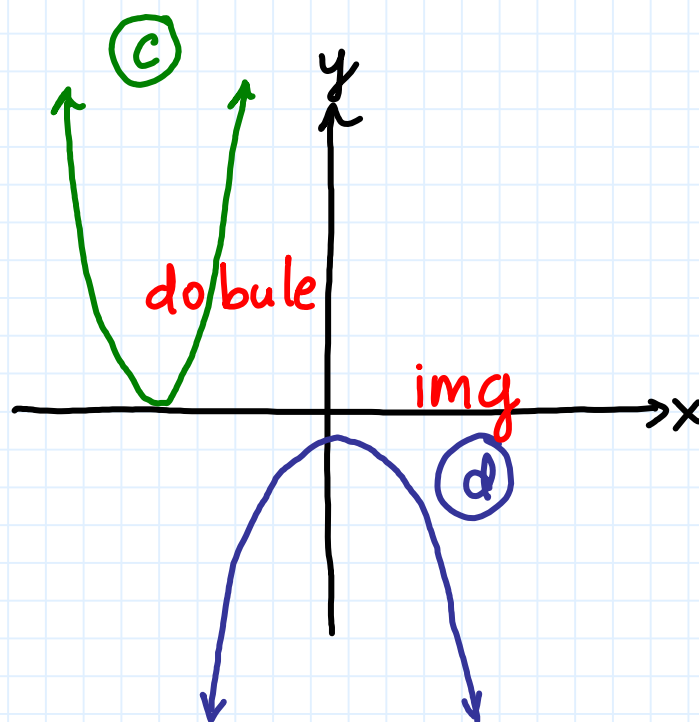
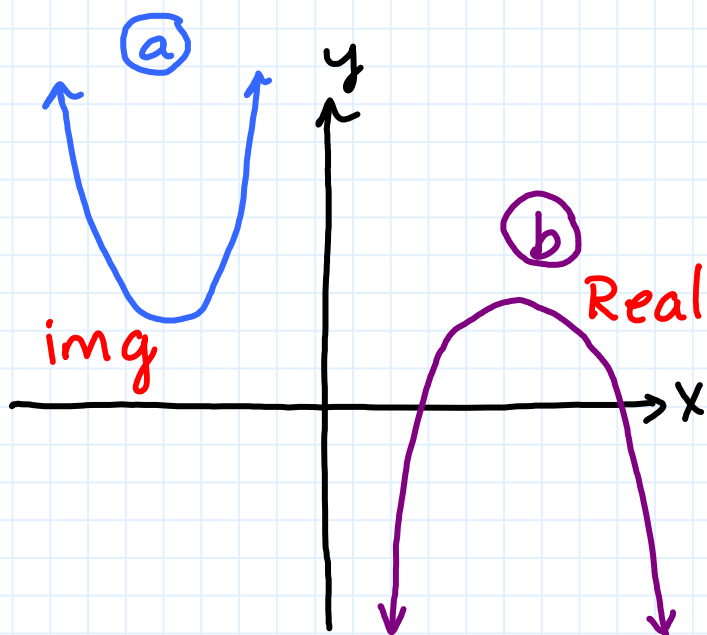
$$4x^2 - 2x + 3 = 0 \quad -44$$

$$3x - 5x^2 = 8 \quad -151$$

$$9x^2 + x + 2 = 0 \quad -71$$

$$x^2 - 6x = -9 \quad \emptyset$$

Use the graph to determine the nature of the roots





## Example Set: B

Use the discriminant to determine the type of solutions

$$-2x^2 - 3x - 7 = 0$$

img roots

$$4y - y^2 = 1$$

real roots

$$t^2 - 10t + 25 = 0$$

double root

$$3z^2 + 8z + 1 = 0$$

real roots



## Example Set: C

Determine the value of  $k$  for which the equation will have the indicated roots.

$$4x^2 - 3x + k = 0$$

TWO REAL NUMBERS

$$k = -1$$

$$ky^2 + y - 9 = 0$$

TWO IMAGINARY NUMBERS

$$k = -1$$

$$x^2 = -4kx - 1$$

DOUBLE REAL

$$k = \pm \frac{1}{2}$$