

What you will learn about:
Discriminate

Discriminate:

$$\underline{b^2 - 4ac}$$

$$b^2 - 4ac > 0 \text{ (Pos)}$$

2 Real Solutions

(Cross x-axis twice)

$$b^2 - 4ac < 0 \text{ (Neg)}$$

No Real solutions

2 complex Solutions

(Does not cross x-axis)

$$b^2 - 4ac = 0$$

One real Solution

(Double Root)

(Vertex is on x-axis)

Find the value of the discriminate and give the number of solutions.

$$a=2 \quad b=-2 \quad c=3$$

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

$$b^2 - 4ac$$

$$(-2)^2 - 4(2)(3)$$

$$4 - 24$$

$$-20$$

2 complex Solutions

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

$$a=1 \quad b=-3 \quad c=-4$$

$$(-3)^2 - 4(1)(-4)$$

$$9 - (-16)$$

$$25$$

2 Real Solutions

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

$$a=-1 \quad b=2 \quad c=-1$$

$$2^2 - 4(-1)(-1)$$

$$4 - 4$$

$$0$$

One Real Solution

Type of Solutions

Rational (Real Number)

Discriminate > 0

Discriminate is
perfect square

No square roots and No i 's

$$\frac{2}{3} \pm \frac{7}{5}$$

$$-\frac{11}{8} \pm \frac{21}{8}$$

$$-4, \frac{10}{8}$$

Irrational (Real Number)

Discriminate > 0

Discriminate is not
a perfect square.

Square Root but no i 's

$$\frac{1}{2} \pm \frac{\sqrt{5}}{2}$$

Complex (Non-Real)

Discriminate < 0

Has an i .

$$\frac{1}{2} \pm \frac{1}{4}i$$

$$\frac{1}{2} \pm \frac{\sqrt{5}}{2}i$$

$$2 \pm 3i$$

