

**The
Discriminant
of a
Quadratic
Equation**

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Instructions

Print or copy page 3 and 4 double sided.

Cut the bottom off on the dotted line.

Place the paper so the examples are face down.

Cut along the dotted lines to create flaps.

Flip and fold the flaps inwards.

Glue the foldable into notes or on a piece of construction paper.

Go through the foldable with your students.

When the
discriminant
equals
zero how many
solutions
are there?

When the
discriminant
is a negative
number how
many solutions
are there?

What is a
discriminant?

How do you find
the discriminant?

When the
discriminant
is a positive
number how
many solutions
are there?

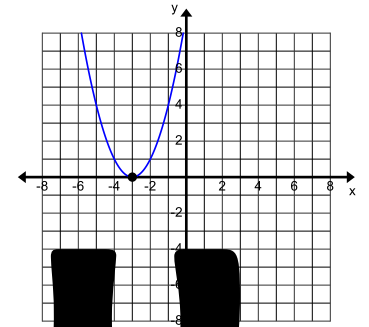
Preview

Definition

How to find the discriminant

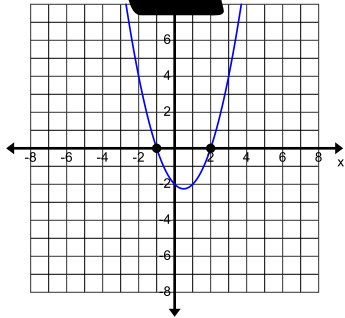
Find the discriminant

Graph of
 $f(x) = x^2 + 6x + 9$



Preview

Graph of
 $g(x) = x^2 - 2$



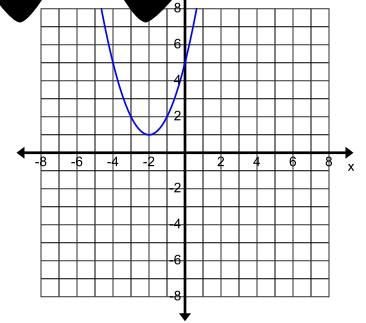
Find the discriminant

$g(x) = x^2 - 2$

Find the discriminant

$h(x) = x^2 + 4$

Graph of
 $f(x) = x^2 + 5$



When the
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When the
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Preview

Definition

A discriminant is a number that can be calculated from any quadratic equation.

The value of the discriminant determines the number of solutions a quadratic equation has.

How to find the discriminant

A Discriminant can be found by using the formula: $b^2 - 4ac$

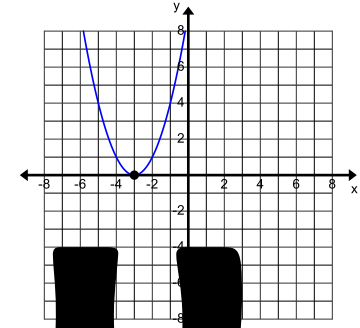
Find the discriminant

$f(x) = x^2 + 6x + 9$
 $a = 1, b = 6, c = 9$

$b^2 - 4ac$
 $= 6^2 - 4(1)(9)$
 $= 36 - 36$
 $= 0$

so there is one solution when $b^2 - 4ac = 0$

Graph of $f(x) = x^2 + 6x + 9$



Find the discriminant

$g(x) = x^2 - 2x - 2$
 $a = 1, b = -1, c = -2$

$b^2 - 4ac$
 $= (-1)^2 - 4(1)(-2)$
 $= 1 + 8$
 $= 9$

Two solutions when $b^2 - 4ac > 0$

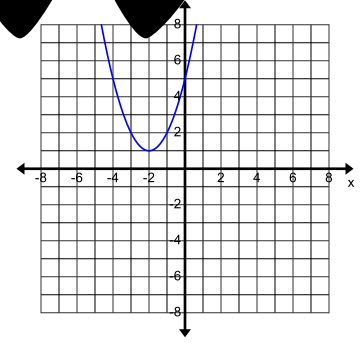
Find the discriminant

$h(x) = x^2 + 4x + 5$
 $a = 1, b = 4, c = 5$

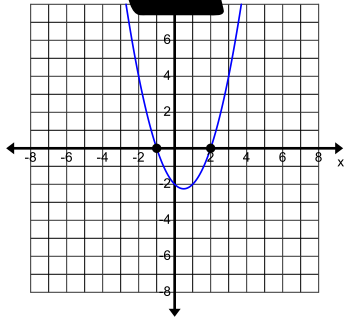
$b^2 - 4ac$
 $= (4)^2 - 4(1)(5)$
 $= 16 - 20$
 $= -4$

No solution when $b^2 - 4ac < 0$

Graph of $h(x) = x^2 + 4x + 5$



Graph of $g(x) = x^2 - 2x - 2$



Preview