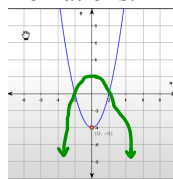


Quadratic equation- a quadratic function set equal to 0; has the form $ax^2 + bx + c = 0$ or $a(x-h)^2 + k = 0$;

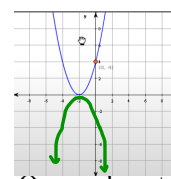
There are 5 different ways that you can solve a quadratic, including graphing.

Roots- solutions to quadratic equations; x-intercepts or zeros of a quadratic function
Synonyms for roots = solutions, zeros, x-intercepts

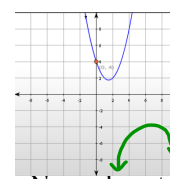
Any quadratic equation has three possible root combinations.



Two real roots- crosses x-axis twice; roots are $x = -2$; $x = 2$

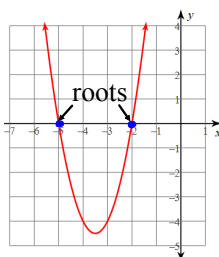


One real root- the vertex is on the x-axis; touches x-axis once; root is $x = -2$



No real roots- does not cross x-axis

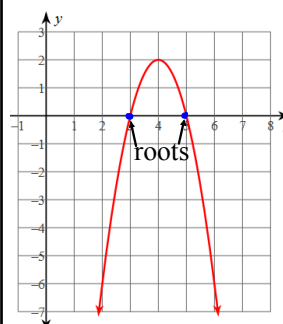
$y = 2x^2 + 14x + 20$



The roots are the x-intercepts.

For this problem, the roots are $x = -5$ and $x = -2$.

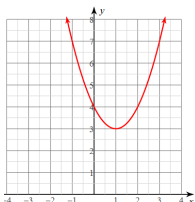
$y = -2x^2 + 16x - 30$



The roots are the x-intercepts.

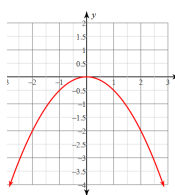
For this equation, the roots are $x = 3$ and $x = 5$.

$y = x^2 - 2x + 4$



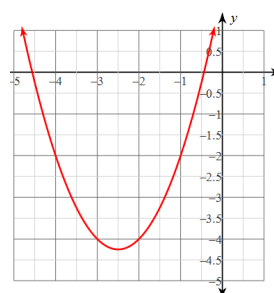
This parabola does not cross the x-axis, so the roots are no real roots.

$y = -\frac{1}{2}x^2$



The parabola crosses x-axis once, so the root is $x = 0$.

$y = x^2 + 5x + 2$



This parabola has 2 real roots. However, since the parabola does not cross at integers, this is why there are 4 additional methods for how to solve a quadratic equation.