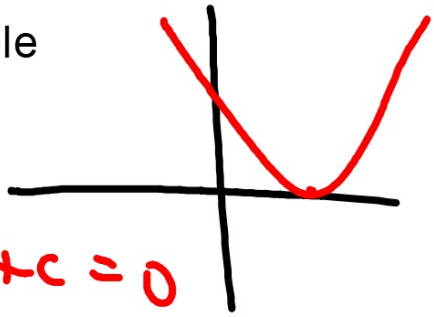
Algebra 2 4.2 $\frac{-b}{2a}$

Solve quadratic equations by graphing

Estimate solutions of quadratic equations by graphing

Write and solve quadratic equations

p.s. not everything is factorable



quadratic function

quadratic equation

standard form $ax^2+bx+c=0$

zero(s)

root(s)

no solution

double root

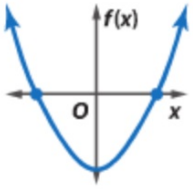
whiteboards

KeyConcept Solutions of a Quadratic Equation

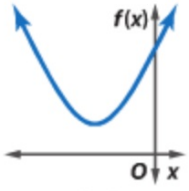
Words A quadratic equation can have one real solution, two real solutions, or no real solutions.

Models

one real solution



two real solutions



no real solution

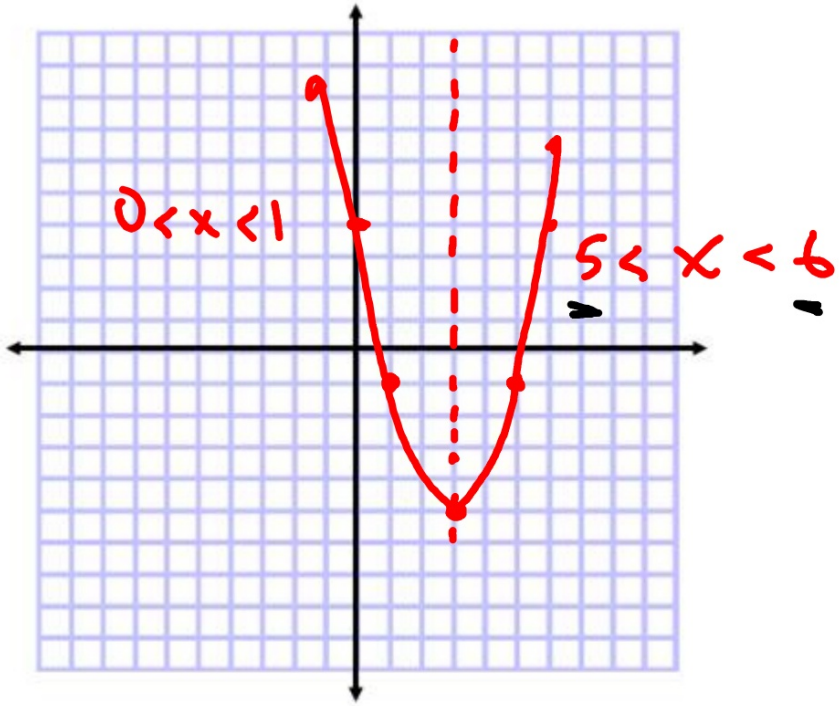
Example 4 Estimate Roots

Solve $x^2 - 6x + 4 = 0$ by graphi
consecutive integers between w

~~6 > x > 5~~

$x = \frac{6}{2} = 3$

	x^2-6x+4	
3	9-18+4	-5
5	25-30+4	-1
6	36-36+4	4



GuidedPractice

4. Solve $x^2 - x - 10 = 0$ by graphing. If exact roots cannot be found, state the consecutive integers between which the roots are located.

x^2 ...

Guess and check does not count!

x = 1st no. 6 | -4

y = 2nd no. -4 | 6

12. **NUMBER THEORY** Use a quadratic equation to find two real numbers with a sum of 2 and a product of −24.

$-4 + y = 2$

$x + y = 2$

$y = 2 - x$

$x(y) = -24$

$x(2 - x) = -24$

$2x - x^2 = -24$

$-2x + x^2 \quad +2x - 2x$

$x^2 - 2x - 24 = 0$

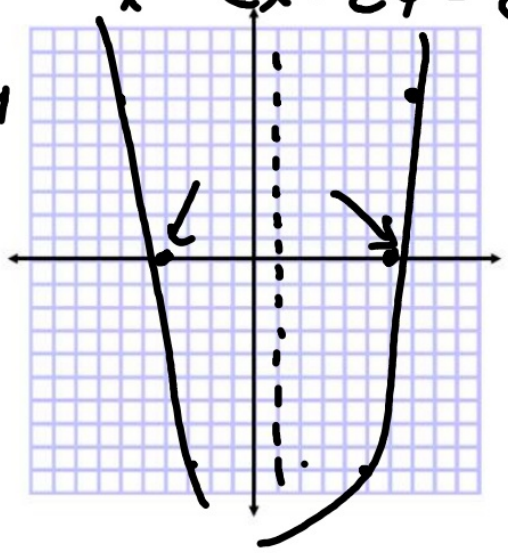
$x = \frac{+2}{2} = 1$

1	1 − 2 − 24	−23
5	25 − 10 − 24	−9
7	49 − 14 − 24	7
6	36 − 12 − 24	↑
−4	16 + 8 − 24	0

$x = 6$

$x = -4$

Write eq and graph:



NUMBER THEORY Use a quadratic equation to find two real numbers that satisfy each situation, or show that no such numbers exist.

33 Their sum is −15, and their product is −54.

$x = 1^{st}$

$y = 2^{nd}$

$x + y = -15$

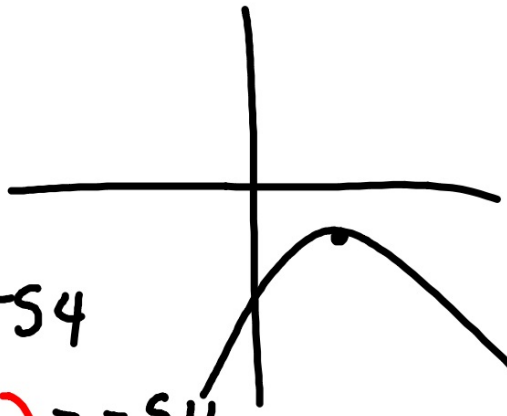
$y = -15 - x$

$x \cdot y = -54$

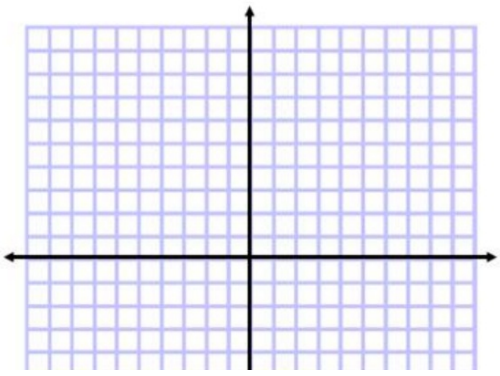
$x(-15 - x) = -54$

$-15x - x^2 = -54$

$x^2 + 15x - 54 = 0$



Write eq & graph



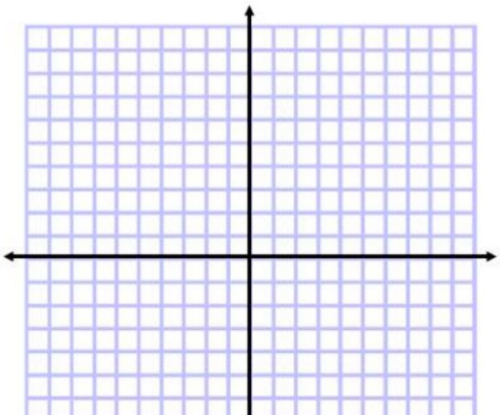
34. Their sum is 4, and their product is -117.

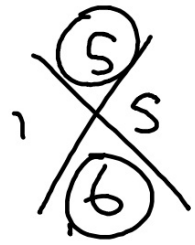
$x + y = 4 \qquad xy = -117$

35. Their sum is 12, and their product is -84.

Example 3 No Real Solution

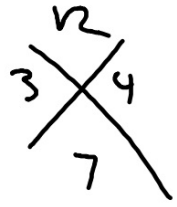
NUMBER THEORY Use a quadratic equation to find two real numbers with a sum of 15 and a product of 63.





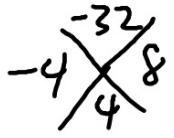
$x^2 + 6x + 5$

$(x+1)\cdot(x+5)$



$x^2 + 7x + 12$

$(x+3)\cdot(x+4)$



$x^2 + 4x - 32$

$(x-4)(x+8)$

WB 4.2 pr.

+ 34, 36