Discriminant

- To find the number of real solution of a quadratic equation, calculate the discriminant: $b^2 - 4ac$
- If $b^2 - 4ac$>0 (**positive**) then there are 2 real solutions
- If $b^2 - 4ac$=0 then there is one real solution
- If $b^2 - 4ac$ <0 (**negative**) then there is NO real solution, there is a **complex conjugate pair** of solutions.

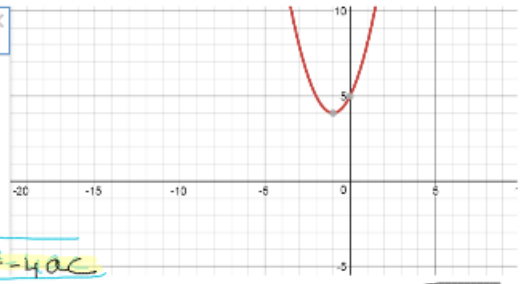
Section. P6

Notes

b^2-4ac (discriminant How many sol.)

P 53: 41-44 Homework

41) $x^2 + 2x + 5 = 0$



$a = 1$
$b = 2$
$c = 5$

Solve $x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$

$\sqrt{-} \rightarrow i$

b^2-4ac

$2^2-4(1)(5)$

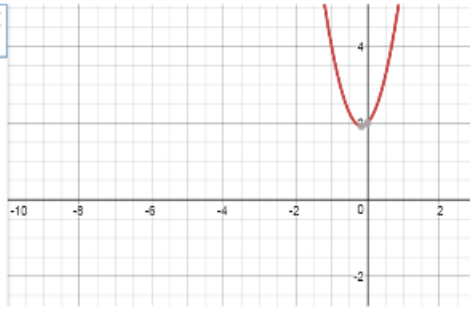
$= 4 - 20 = -16 < 0$

No real sol.

P 53 # 41-44 (Hw section)

Don't solve Find the # of solutions

42) $3x^2 + x + 2$



$a = 3$
$b = 1$
$c = 2$

$b^2 - 4ac$
$= 1^2 - 4(3)(2)$
$= 1 - 24 = -23 < 0$

No real sol.

43) $4x^2 - 6x + 4$

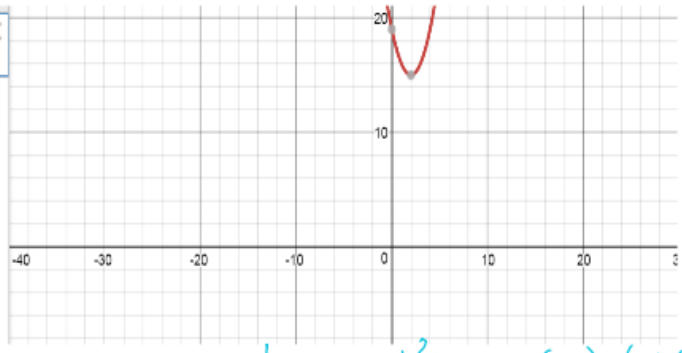
$\pm\sqrt{0}$

No real sol.

$4x^2 - 6x + 5 = x + 1$
$-x \quad -1 \quad -x - 1$
Rearrange
$4x^2 - 7x + 4 = 0$

$a = 4 \quad b = -7 \quad c = 4$
$b^2 - 4ac$
$49 - 4(4)(4)$
< 0

44) $x^2 - 4x + 19$



No real sol.

$x^2 + x + 11 = 5x - 8$
$-5x + 8 \quad -5x + 8$
$x^2 - 4x + 19 = 0$
$a = 1 \quad b = -4 \quad c = 19$

$(-4)^2 - 4(1)(19)$
$16 - 76$
$-60 < 0$

$2x^2 - 4x = t$

In the equation above, t is a constant. If the equation has no real solutions, which of the following could be the value of t?

A. -3
B. -1
C. 1
D. 3

SAT Challenge question

Discriminant < 0

1st method Guess & check

$2x^2 - 4x = -3$ (A)

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

Find Discriminant $a = 2 \quad b = -4 \quad c = 3$

$b^2 - 4ac = (-4)^2 - 4(2)(3)$
$= 16 - 24$
$= -8 < 0$

$2x^2 - 4x - t = 0$
$a = 2$
$b = -4$
$c = -t$

$b^2 - 4ac < 0$
$16 - 4(2)(-t) < 0$
$16 + 8t < 0$
$\frac{8t}{2} < \frac{-16}{2}$
$t < -2$

p 58 # 9-14 , 17-26 wed.

9- $[-7, -\frac{3}{2}]$

10- $(-\infty, \frac{2}{3}] \cup [3/2, \infty)$

11- $(-\infty, -5) \cup (3/2, \infty)$

12- $(1/4, 2)$

13- $(-\infty, -2) \cup (1/3, \infty)$

14- $(-3, 7)$