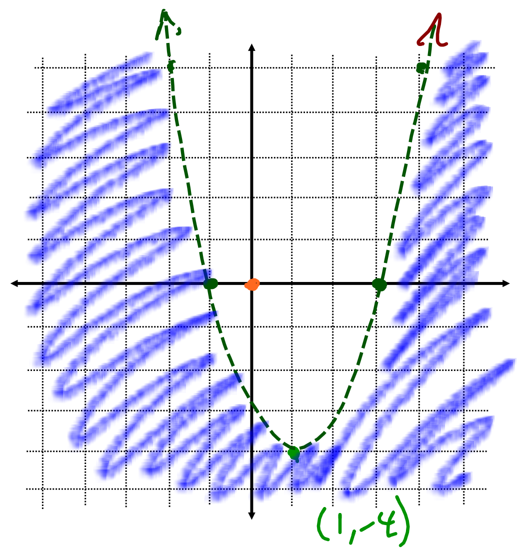
9.3 Quadratic Inequalities in two variables

* A quadratic inequality in two variables describes an area on a cartesian plane either above or below the line... much like a linear inequality in two variables.

* As before, if we have an exclusive inequality (< or >), we represent the boundary by a dotted line to indicate that the line itself is not part of the solution and we use a test point to determine on which side the solution lies.

ex. $y < x^2 - 2x - 3$



1) determine the line type you will use

exclusive → dotted

2) graph $y = x^2 - 2x - 3$

$y = (x-3)(x+1)$

$\boxed{x=3}$ $\boxed{x=-1}$

AOS: $-\frac{(-2)}{2(1)} = 1$

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

3) Test a point: Always (0, 0) if possible

$0 < (0)^2 - 2(0) - 3$

$0 < -3$ false ⇒ ∴ (0,0) is not part of the sol^n

4) Conclude by shading the appropriate area. ⇒ shade region NOT containing (0,0)

* On Ti-83

Your turn pg. 482 $y \le -x^2 + 2x + 4$

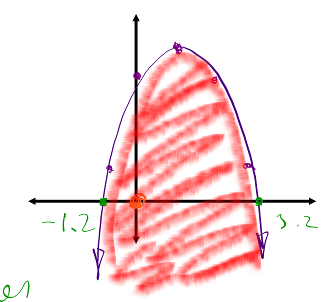
AOS = 1

$y_v = 5$

test: (0,0)

$0 \le 4$ true

so shade under



Homefun: Pg. 496 #(3, 4, 6, 7, 8)ab, 10, 12, 16

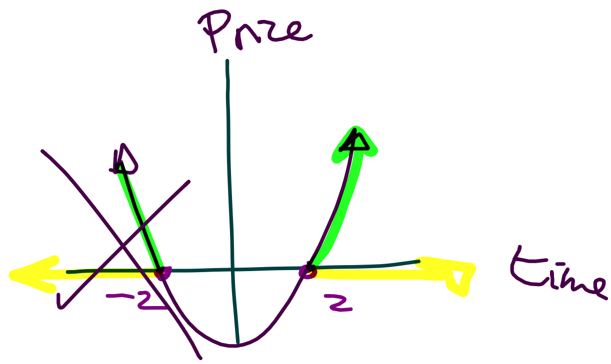
12. $-t^2 + 14 < P$

$-t^2 + 14 < 10$

$0 < t^2 - 4$

$0 = (t+2)(t-2)$

$\boxed{t=-2}$ $\boxed{t=2}$ $\Longrightarrow$ $\boxed{t > 2 \text{ yrs}}$



Since $t \geq 0$, $\boxed{t < -2}$ is <u>not</u> a sol^{n}