5-7 Quadratic Inequalities

Ex. 1 Graph the system of inequalities

$y < -x^2 + 9$ CK(0,0) T

$y > x^2 + 5x - 6$ CK(0,0) T

$y = -x^2 + 9$

V(0, 9)

x	y
2	5
-2	+5

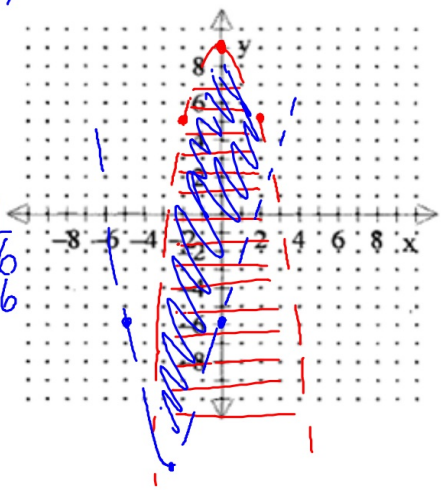
$y = x^2 + 5x - 6$

V(-2.5, -12.25)

x	y
0	-6
-5	-6

$y = (-2.5)^2 + 5(-2.5) - 6$

$6.25 - 12.5 - 6$



Ex. 2 Solve the inequalities:

$x \le -4$ OR $0 \le x \le \frac{1}{3}$

a) $2x^2 - x > 3$

$2x^2 - x - 3 > 0$

$(2x - 3)(x + 1) = 0$

$x = \frac{3}{2}, -1$ critical points

T F T

-1 0 $\frac{3}{2}$ 2

$x < -1$ OR $x > \frac{3}{2}$

Try 0: $0 - 0 > 3$ F

-2: $8 + 2 > 3$ T

2: $8 - 2 > 3$ T

b) $3x^3 + 11x^2 - 4x \le 0$

$x(3x^2 + 11x - 4) \le 0$

$x(3x - 1)(x + 4) = 0$

$x = 0, 1/3, -4$ critical pts

T F T F

-4 0 1/3

Try: -5 $3(-125) + 11(25) + 20 \le 0$ T

-1 $-3 + 11 + 4 \le 0$ F

Try 1: $3 + 11 - 4 \le 0$ F

$\frac{1}{5}$ $3\left(\frac{1}{125}\right) + 11\left(\frac{1}{25}\right) - \frac{4}{5} \le 0$

$\frac{3 + 55 - 100}{125} \le 0$