## Linear Inequalities Review

- Solve the following inequalities:

A. $X+4>0$ (positive)

$-4 \quad -4$

$x > -4$

The inequality $x+4>0$ is true when x is greater than $-4$

the quantity $x+4$ is positive when x is greater than $-4$

B. $2x+3<0$

C. $-x+5>0$

$-\ \ -4\ \ +\ \ 0\ \ +\ \ \infty$

solution $(-4, \infty)$

B. $2x+3<0$ negative

$2x+3=0$

$-3 \quad -3$

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

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

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

Solution $(-\infty, -\frac{3}{2})$

C. $-x+5>0$

$-x+5=0$

$+x \quad +x$

$5 = x$

$+\ \ 0\ \ +\ \ 5\ \ -$

Solution $(-\infty, 5)$

## Solve the Quadratic Inequality Algebraically

$x^2 - x - 12 > 0$

1. Factor it and find the zeros
2. Draw a number line (or table) and locate the zeros
3. Fill out the signs for each factor, then find the sign of the whole expression
4. Choose the correct interval

1. $x^2 - x - 12 = 0$

$-12$, $-4 \times 3$, $-1$

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

$x-4=0 \quad x+3=0$

$x=4 \quad x=-3$

$-\ \ -3\ \ +\ \ 4\ \ +$

whole expression $+\ \ -\ \ +$

Solution : $(-\infty, -3) \cup (4, \infty)$

## Solving Quadratic Inequalities

- Section P7: p54-59

Graphically

$y = x^2 - x - 12 > 0$ (positive)

y positive above the x-axis

1. Find the zeros (by factoring)
2. Find the parts of the parabola that satisfy the inequality (either above the x axis or below the x axis)
3. Find the corresponding x values

1. $(x-4)(x+3) > 0$

$x^2 - x - 12 > 0$ means parts of the parabola above the x axis.

$(-\infty, -3) \cup (4, \infty)$

-3, 4, -12

## Example 4 p55

$2x^2 + 3x \leq 20$

$-20 \quad -20$

- Solve the above inequality graphically and algebracailly

**Graphically**

$2x^2 + 3x - 20 \leq 0$

$a=2 \quad b=3 \quad c=-20$

$-40$, $-5 \times 8$, $3$

$1 \mid 40$, $2 \mid 20$, $4 \mid 10$, $5 \mid 8$

$(x-\frac{5}{2})(x+\frac{8}{2})$

$(2x-5)(x+4)$