
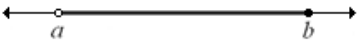









MHF 4UI
Unit 1 Polynomials
Day 10 - Solving Polynomial Inequalities (2.6)
and Interval Notation

Interval Notation	Number Line Sketch	Set-builder Notation
(a, b)		$\{x \mid a < x < b\}$
$(a, b]$		$\{x \mid a < x \leq b\}$
$[a, b)$		$\{x \mid a \leq x < b\}$
$[a, b]$		$\{x \mid a \leq x \leq b\}$
(a, ∞)		$\{x \mid x > a\}$
$(-\infty, b)$		$\{x \mid x < b\}$
$[a, \infty)$		$\{x \mid x \geq a\}$
$(-\infty, b]$		$\{x \mid x \leq b\}$
$(-\infty, \infty)$		R

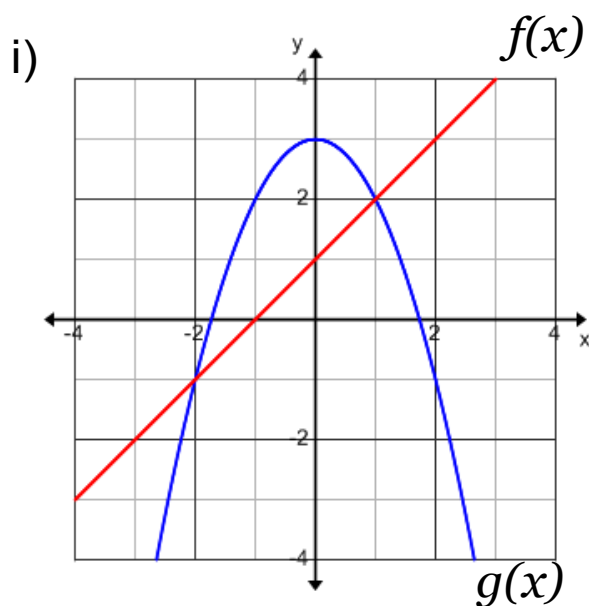
**** This chart is on page 8 in your textbook****

Examples of Interval Notation:

For each of the following graphs state:

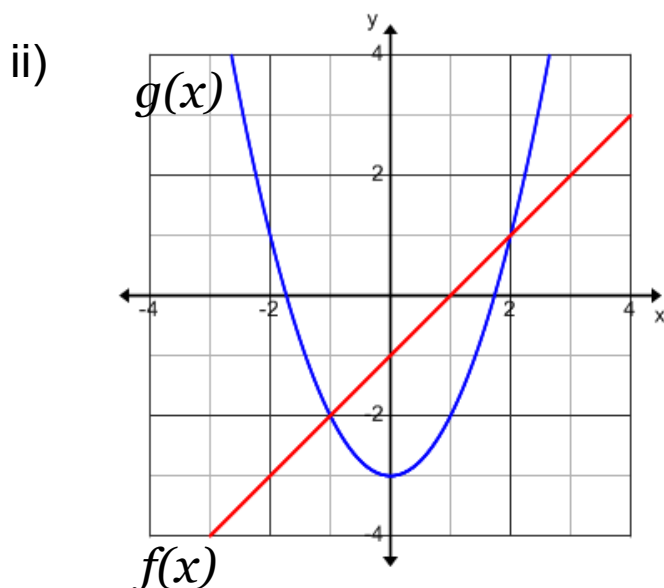
a) Where $f(x) > 0$ and $f(x) < 0$

b) Where $f(x) > g(x)$



a) Where $f(x) > 0$
and $f(x) < 0$

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a) Where $f(x) > 0$
and $f(x) < 0$

b) Where $f(x) > g(x)$

Polynomial Functions and Inequalities

Recall: Polynomial Expression: $x^3 + 4x^2 - 2x + 3$

Polynomial Equation: $x^3 + 4x^2 - 2x + 3 = 0$

Polynomial Function: $y = x^3 + 4x^2 - 2x + 3$

We can interpret polynomial functions by looking at the graph and finding key pieces of information:

- domain and range
- real zeroes
- y-intercept
- intervals where the function is positive
- intervals where the function is negative
- approximate coordinates of any maximums and/or minimums
- any symmetry
- end behaviour

Example 1. Given the following graph of the polynomial function , determine:

a) Domain and Range

b) Real Zeroes

c) y – intercept

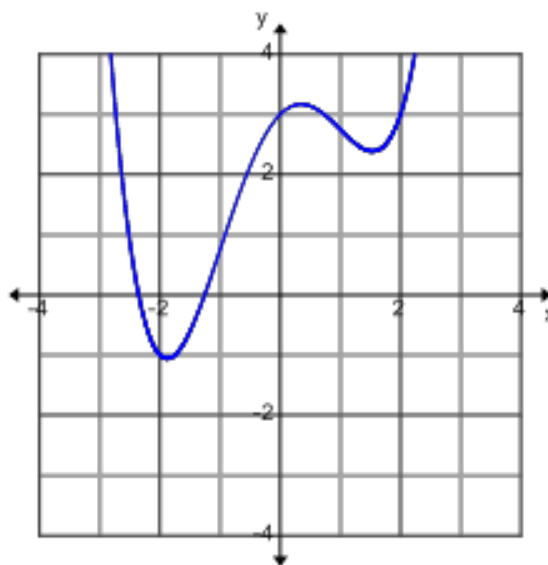
d) intervals where $f(x) > 0$

e) intervals where $f(x) < 0$

f) approximate coordinates of any maximums or minimums

g) any symmetry

h) end behaviour



Solving a Factorable Inequality

To solve a factorable inequality we look at the intervals where $f(x) > 0$ and $f(x) < 0$

Example 2: Solve the inequality: $x^2 + 8x \leq 9$

Steps:

Rearrange the inequality

Write the corresponding equality

Factor

Determine the zeros

Create an Interval Chart

Interval			
Sign			

Example 3: Solve $x^3 - 2x^2 - 5x > -6$

Interval				
Sign				

** For non-factorable inequalities you need to use DESMOS to find the zeros and then use the graph to find the areas asked for in the inequality.

*** For word problems # 9 and # 12 you should use DESMOS