

Solving Polynomial Inequalities: Friday, October 1st, 2010

First

Quiz on The Remainder and Factor Theorem

Then

Solving Polynomial Inequalities

- How do we express inequalities?

a is:

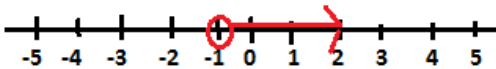
$a < b$	less than
$a > b$	greater than
$a \leq b$	less than or equal to
$a \geq b$	greater than or equal to

- What does an inequality mean?

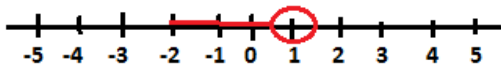
It means lack of equality, so how do we express inequalities in math?

Well, there are 2 ways:

1.

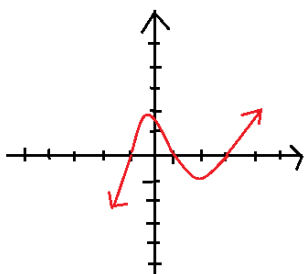


Meaning: $x > -1$



Meaning: $-2 < x < 1$

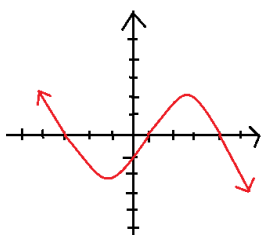
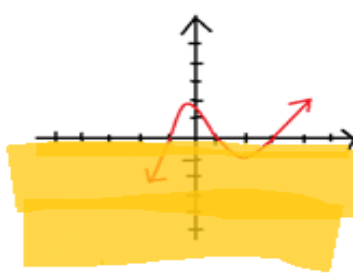
2.



When is $f(x) < 0$?

$$x < -1$$

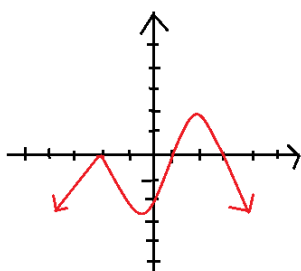
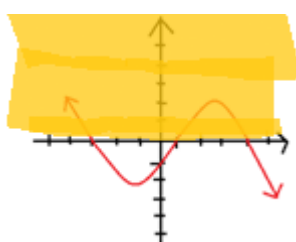
$$1 < x < 3$$



Solve: $0 \leq -\frac{1}{2}(x-1)(x+3)(x-4)$

$$x \leq -3$$

$$1 \leq x \leq 4$$

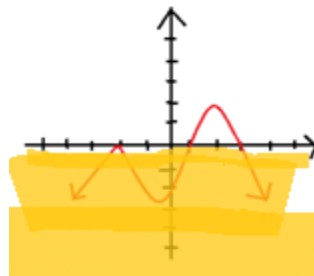


Solve: $-(x+2)^2(x-1)(x-3) < 0$

$$x < 1 \quad x > 3$$

$$x \neq -2 \quad \text{OR} \quad -2 < x < 1$$

$$x < -2$$



* IMPORTANT: Make sure to carefully read the function as this one states that the function has to be greater than zero. Therefore, when writing the inequalities for this function the x values cannot equal to -2, 1, or 3.

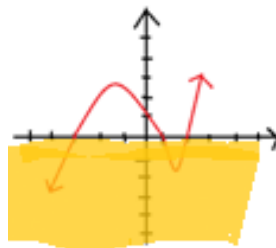
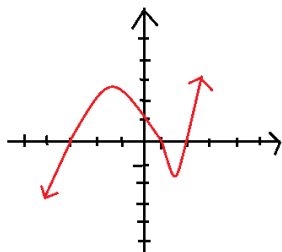
Solve: $m^3 - 7m + 6 < 0$

* IMPORTANT: Need to factor this function first in order to solve for the zeros and state the inequalities.

$$\begin{array}{r} f(1) = 0 \\ (m-1) \end{array} \quad \begin{array}{r} \underline{1} 1 -7 6 \\ 1 -6 0 \end{array}$$

$$\begin{aligned} \text{So, } m^2 + m - 6 \\ = (m+3)(m-2) \end{aligned}$$

Therefore the roots are: $(m-1)(m+3)(m-2)$



$$\begin{aligned} m &< -3 \\ 1 &< m < 2 \end{aligned}$$

* Here is an excellent web link that will help you practice:

<http://www.dpcdsb.org/NR/rdonlyres/0436904B-E4B3-4B0C-8E78-BBF5497B9229/30662/311SolvingPolynomialInequalities.pdf>