Solving Quadratic Inequalities in One Variable

January-31-19
1:28 PM

PRE-CALCULUS 11
INEQUALITIES & SYSTEMS OF EQUATIONS
SOLVING QUADRATIC INEQUALITIES IN ONE VARIABLE

A. Definitions

1. **inequality:** a mathematical statement showing that sides of an equation are not equal. ex) $>$, $<$, $\geq$, $\leq$, $\neq$

2. **quadratic equation:** any quadratic equation that can be written in the form: $ax^2+bx+c=0$, where a, b, and c are constants and $a \neq 0$.

3. **quadratic inequality:** any quadratic inequality that can be written in the form:
   $ax^2+bx+c<0$ or $ax^2+bx+c\leq 0$

   $ax^2+bx+c>0$ or $ax^2+bx+c\geq 0$

   where a, b, and c are constants and $a \neq 0$.

4. **critical values:** the x-intercepts of the quadratic equation used to help determine the answer(s) to a quadratic inequality.

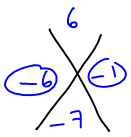
B. Solving a Quadratic Inequality Using a Number Line and Interval Test Points

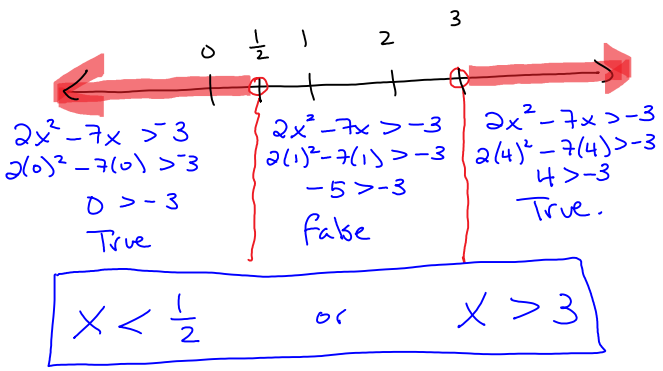
1) $2x^2-7x>-3$

To Solve

1) Find the critical values by solving the quadratic equation.

$2x^2-7x=-3$
$+3 \quad +3$
$2x^2-7x+3=0$
$(x-\frac{6}{2})(x-\frac{1}{2})=0$
$(x-3)(2x-1)=0$
$x=3, \frac{1}{2}$ critical values.





$x<\frac{1}{2}$ or $x>3$

2) Set up a number with the critical values. Use the correct type of dots

3) Choose a test point in each section to find the correct answers.

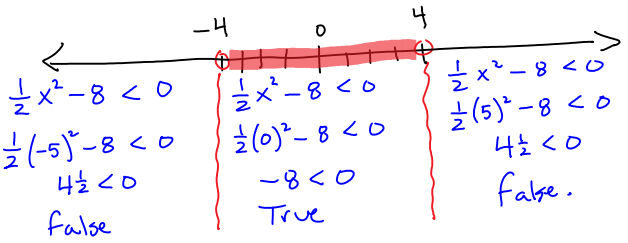
2) $\frac{1}{2}x^2 - 8 < 0$

$\frac{1}{2}x^2 - 8 = 0$

$\frac{1}{2}(x^2 - 16) = 0$

$\frac{1}{2}(x+4)(x-4) = 0$

$x = -4, 4$ critical values.



$-4 < x < 4$

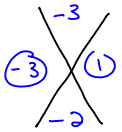
3) $2x^2 - 6 \geq 4x$

$2x^2 - 6 = 4x$
$-4x \quad -4x$

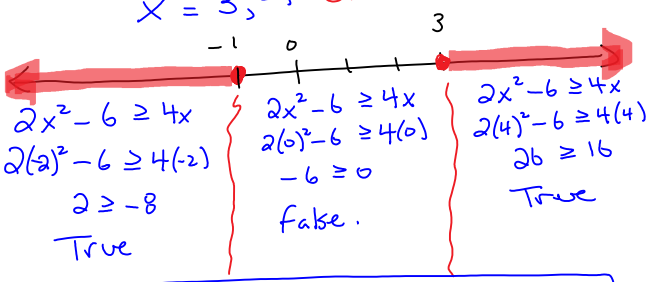
$2x^2 - 4x - 6 = 0$

$2(x^2 - 2x - 3) = 0$

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



$x = 3, -1$ critical values.



$x \leq -1$ or $x \geq 3$

Assignment: Pg. 346 #5, 6, 7