1.1, #21 Solve $x^2 - x < 0$, express the solution set in interval notation and show the solution set on the real line.

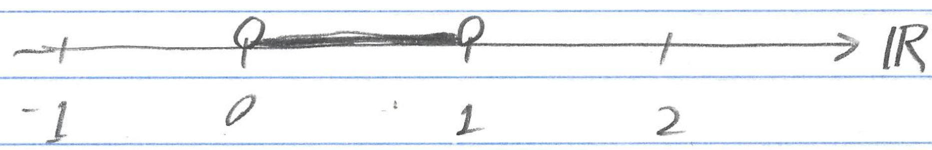
Solution

Notice $x^2 - x = 0$ implies $x(x-1) = 0$, or $x = 0$ or $x = 1$. Now $x^2 - x$ is "continuous," so between the points where it's 0, it is either positive or negative. That is, $x^2 - x$ has the SAME SIGN on the intervals $(-\infty, 0)$, $(0, 1)$, $(1, \infty)$. We use TEST VALUES as follows:

	$(-\infty, 0)$	$(0,1)$	$(1,\infty)$
Test value k	-1	$1/2$	2
$k^2 - k$	$(-1)^2 - (-1) = 2$	$(\frac{1}{2})^2 - (\frac{1}{2}) = -1/4$	$(2)^2 - 2 = 2$
$x^2 - x$	$+$	$-$	$+$

So $x^2 - x < 0$ for $\boxed{x \in (0, 1)}$.

On the real line we have



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