Recall! On Monday we solved this:

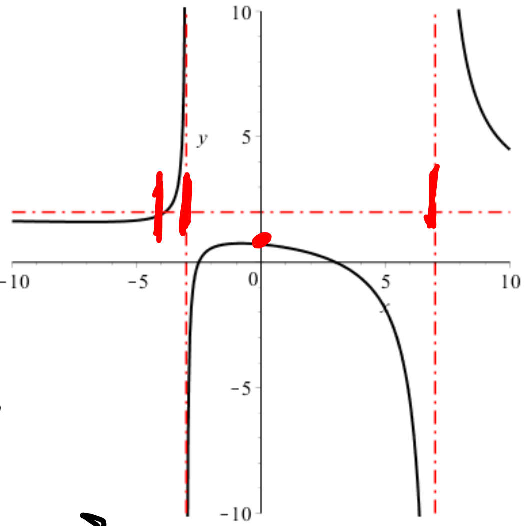
$$R(x) = \frac{2x^2-x-15}{(x-7)(x+3)} = 2$$

$$\frac{\cancel{2x^2}-x-15}{\cancel{x^2}-4x-21}$$

y-int is $\frac{5}{7}$

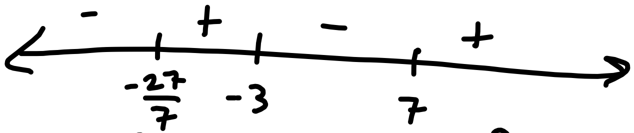
Today: we solve This:

$$\frac{2x^2-x-15}{(x-7)(x+3)} > 2$$



By inspection and the intersection found, Monday the solution is

$$(-\infty, -\tfrac{27}{7}) \cup (7, \infty$$



Sign pattern for $R(x) > 2$

$$\frac{2x^2-x-15}{(x-7)(x+3)} > 2$$

$$LCD = (x-7)(x+3) = x^2-4x-21$$

$$\frac{2x^2-x-15}{LCD} - \frac{2}{1}\cdot\frac{(x^2-4x-21)}{x^2-4x-21} > 0$$

$$\frac{2x^2-x-15-(2x^2-8x-42)}{LCD} > 0$$

$$\frac{2x^2-x-15-2x^2+8x+42}{LCD} > 0$$

$$\frac{2x+7}{(x+3)(x-7)} > 0$$

$$7x+27=0$$
$$7x=-27$$
$$x=\frac{-27}{7}$$

$-$ $+$ $-$ $+$ >0

$-\frac{27}{7}$ -3 7

$\frac{27}{7}=0$ $\cancel{A}$ $\cancel{A}$

why?

N N Y N N N Y

$$= \left(-\frac{27}{7},-3\right)\cup(7,\infty)$$

$$\frac{7BIG+27}{(BIG+3)(BIG-7)} = \frac{+}{(+)(+)} = +$$

Oblique Asymptotes

$$\frac{\text{HIGHER POWER}}{\text{LOWER Power}}$$

Factors by grouping!

$$\frac{x^3-7x^2-9x+63}{x^2-6x+5} = \frac{x^2(x-7)-9(x-7)}{\quad} = \frac{(x-7)(x^2-9)}{\cdots\cdot} = \frac{(x-7)(x+3)(x-3)}{(x-5)(x-1)}$$

$$\frac{x^3}{x^2} = x^{3-2} = x \qquad \frac{-x^2}{x^2} = -1$$

$$
\begin{array}{r l}
 & x - 1 \quad r\ -20x+68 \\
x^2-6x+5 \,\big) & x^3-7x^2-9x+63 \\
 & -(x^3-6x^2+5x) \\
\hline
 & 0 - x^2 - 14x + 63 \\
 & -(x^2+6x-5) \\
\hline
 & -20x+68
\end{array}
$$

Farther than we needed to go.

This says

$x^3-7x^2-9x+63$

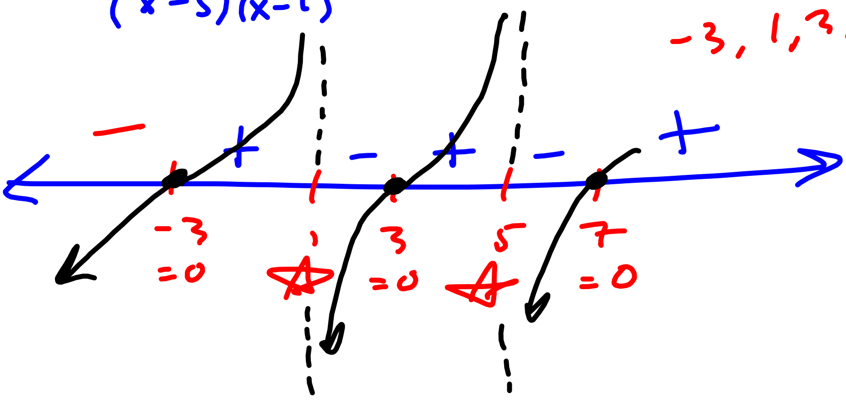
$= (x^2-6x+5)(x-1) + (-20x+68)$

$\boxed{x-1 = y \text{ is S.A.}}$

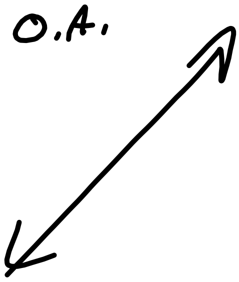
$$\frac{(x-7)(x+3)(x-3)}{(x-5)(x-1)}$$

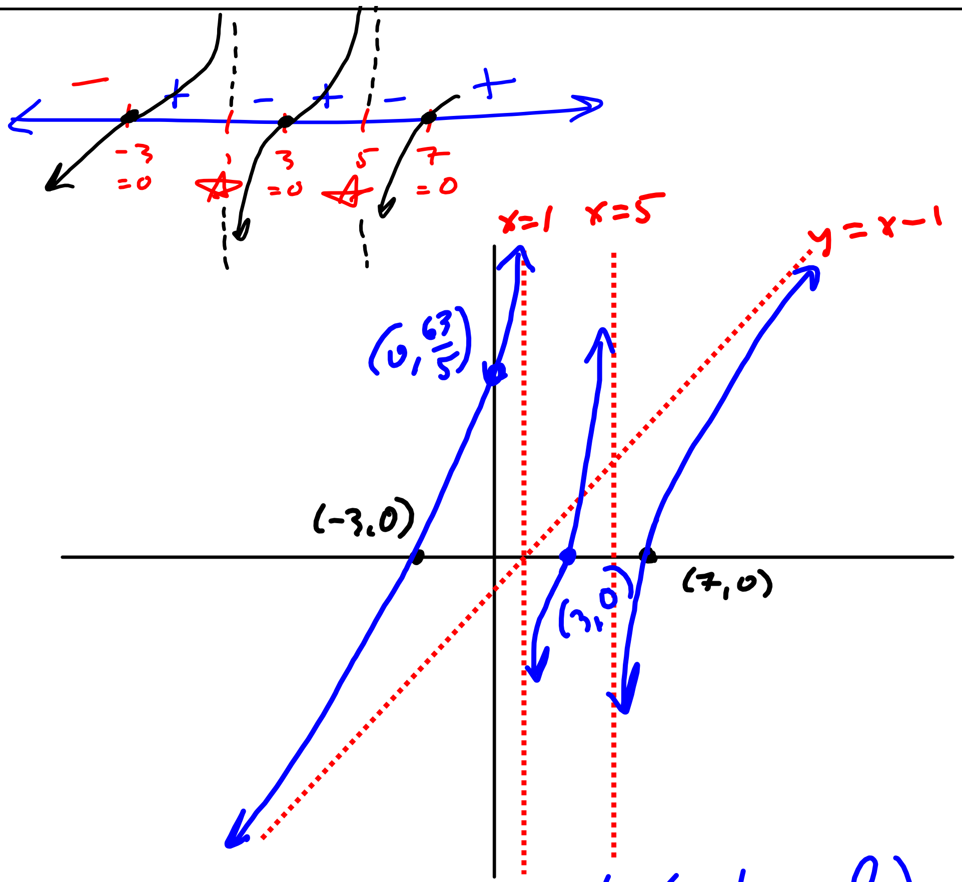
7, -3, 3, 5, 1

-3, 1, 3, 5, 7

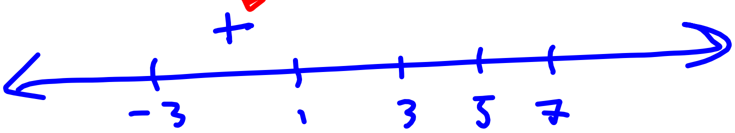


y = x-1 is
O.A.





Using y-int for 1st (and only) test value $\left(0, \frac{63}{5}\right)$: $\frac{63}{5} > 0$ +



Play sign-change game