Love these:

What's the domain?

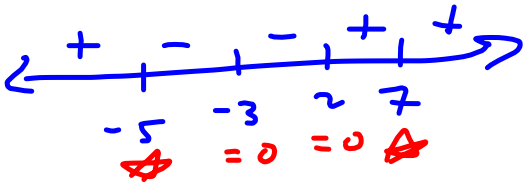
$$f(x) = \sqrt{\frac{(x-2)(x+3)^2}{(x-7)^4(x+5)}}$$

Need $\frac{(x-2)(x+3)^2}{(x-7)^4(x+5)} \geq 0$

and $(x-7)^4(x+5) \neq 0$

$\frac{(x)(x)^2}{(x^4)(x)} = \frac{x^3}{x^5} = \frac{1}{x^2}$ is positive for $x > 7$, in particular.

Test: $x = 8$ in the radicand.



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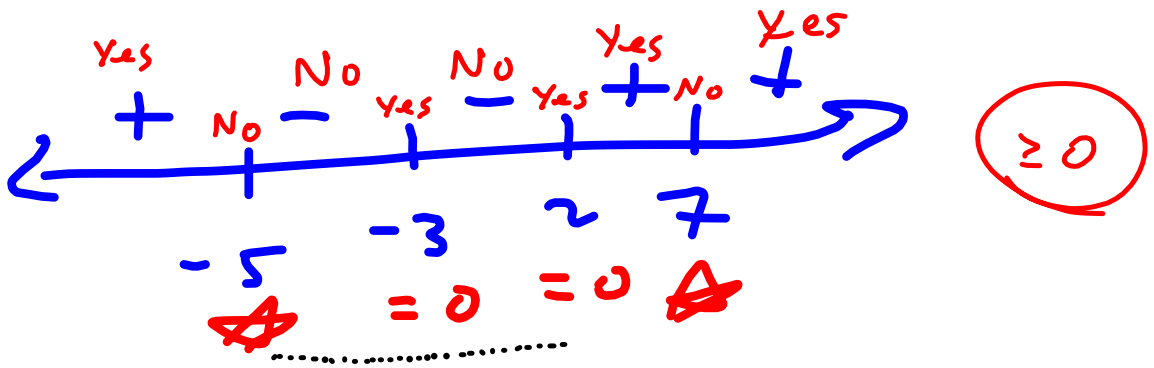
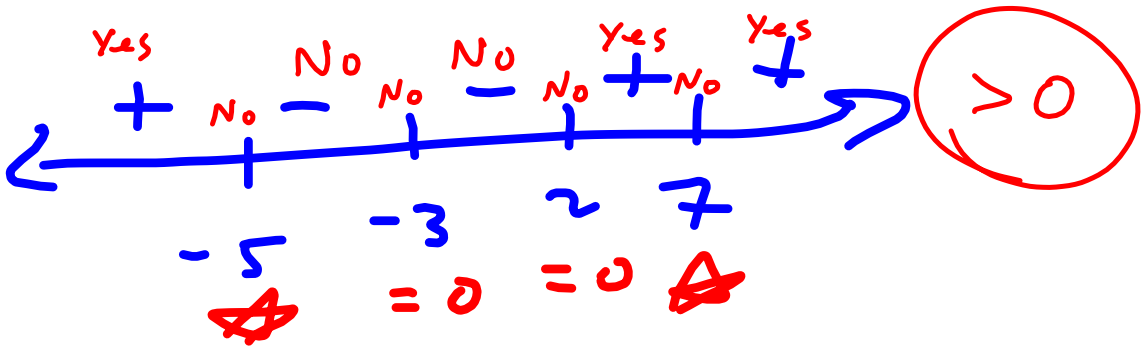


$$x \in (-\infty, -5) \cup \{-3\} \cup [2, 7) \cup (7, \infty)$$

$$g(x) = \ln\left(\frac{(x-2)(x+3)^2}{(x-7)^4(x+5)}\right)$$

Need $\dfrac{(x-2)(x+3)^2}{(x-7)^4(x+5)} > 0$



$x \in (-\infty, -5) \cup (2, 7) \cup (7, \infty)$

Compare and contrast these.

How long to triple an amount invested at 8% compounded...

annually

$P_0(1.08)^t = 3P_0$

$(1.08)^t = 3$

$\ln(1.08)^t = \ln(3)$

$(\ln(1.08))t = \ln(3)$

$t = \frac{\ln(3)}{\ln(1.08)}$

≈ 14.27 yrs

$\ln(x) = \log_e(x)$

$e \approx 2.7$ is L

Ambiguous. Is it $\ln(1.08^t)$ OR $(\ln(1.08))^t$?

$\log_{1.08}((1.08)^t) = \log_{1.08}(3)$

$t = \log_{1.08}(3) = \frac{\ln(3)}{\ln(1.08)}$

daily

$P_0\left(1+\frac{.08}{365}\right)^{365t} = 3P_0$

$\left(1+\frac{.08}{365}\right)^{365t} = 3$

$\ln\left(\left(1+\frac{.08}{365}\right)^{365t}\right) = \ln(3)$

$\left(\ln\left(1+\frac{.08}{365}\right)\right)365t = \ln(3)$

$t = \frac{\ln(3)}{\left(\ln\left(1+\frac{.08}{365}\right)\right)(365)} \approx 13.734$ yrs

continuously?

$P_0e^{.08t} = 3P_0$

$e^{.08t} = 3$

$\ln(e^{.08t}) = \ln(3)$

$.08t = \ln(3)$

$t = \frac{\ln(3)}{.08} \approx 13.733$

$P_0\left(1+\frac{.08}{365}\right)^{365t} = 3P_0$ Tripling time.

$P_0\left(1+\frac{r}{m}\right)^{mt} = 3P_0$ $n = mt =$ # of periods

$\left(1+\frac{r}{m}\right)^{mt} = 3$

$\ln\left(\left(1+\frac{r}{m}\right)^{mt}\right) = \ln(3)$

$\left(\ln\left(1+\frac{r}{m}\right)\right) mt = \ln(3)$

$t = \frac{\ln(3)}{\left(\ln\left(1+\frac{r}{m}\right)\right) m}$

$D = \{x \mid x > 2 \text{ and } x > 1\} = \{x \mid x > 2\}$

$\log_{12}(x-2) + \log_{12}(x-1) = 1$

Exploiting the fact that 12^x & $\log_{12}(x)$ are inverses.

$\log_{12}((x-2)(x-1)) = 1$

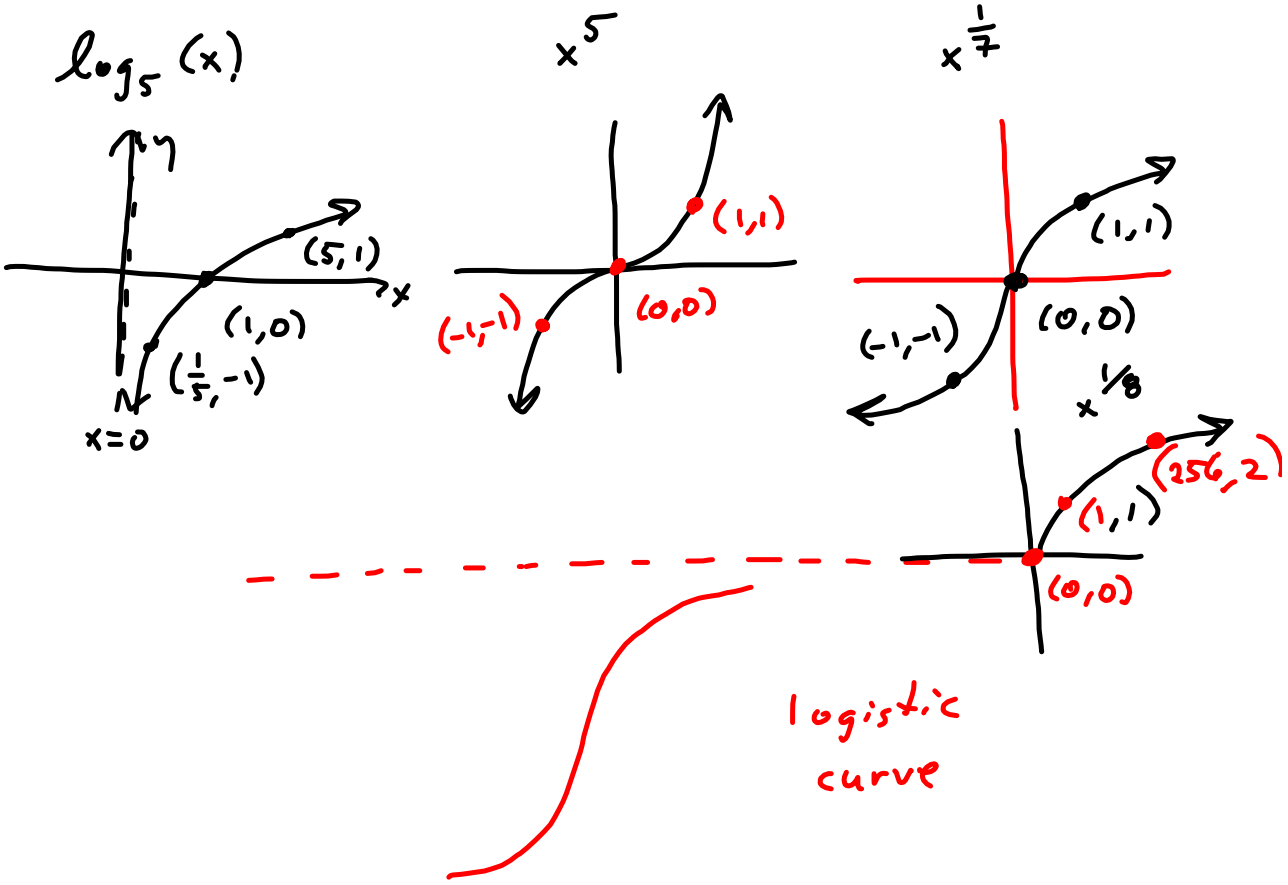
$12^{\log_{12}((x-2)(x-1))} = 12^1$

$(x-2)(x-1) = 12 \Rightarrow \ldots x \in \{5, -2\}$, but $-2 \notin D$ so final answer is $x \in \{5\}$

$x^2 - 3x + 2 = 12$

$x^2 - 3x - 10 = 0$

"The heck you say!" he exclaimed.


$\log_5(x)$
y
x
(5,1)
(1,0)
$(\frac{1}{5},-1)$
x=0
x^5
(1,1)
(-1,-1)
(0,0)
$x^{\frac{1}{7}}$
(1,1)
(-1,-1)
(0,0)
$x^{1/8}$
(256,2)
(1,1)
(0,0)
logistic curve

20-pt or 30-pt takehome portion for Test 4. Apply it to the $\frac{1}{3}$ of points I'm making available to bump your Test 2.

$\frac{1}{2}$ if I'm in a good mood.

40%

60% left.

You can get up to 20% added to Test 2.