After having read the chapter pencil in hand and done this REALITY CHECK,

i. What would you say the idea of the chapter is:

ii. What questions do you have:

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**Rck 13-1.** Let \( f \) be the function specified by the global input-output rule
\[ x \xrightarrow{f} f(x) = -47.18x^3 + 30.67x^2 - 29.04x + 13.52 \]
find its local input-output rule near \( \infty \)

**Your Work:**

i. You must make your case for whatever statement you are making.

ii. Circle which of the following choices corresponds to your result.

   a. \(+13.52 + \ldots\)
   b. \(-47.18x^3 + 30.67x^2 - 29.04x + \ldots\)
   c. \(-47.18x^3 + \ldots\)
   d. \(+1 - 29.04x + \ldots\)
   e. None of the preceding

iii. Check the corresponding box in the **Response Grid** on the front page thus: \( \checkmark \)

**Rck 13-2.** Let the function \( f \) be specified by the global input-output rule
\[ x \xrightarrow{f} f(x) = -45.97x^3 + 13.87x^2 - 24.36x + 16.73 \]
what is Concavity-sign \( f \big|_{\text{near } \infty} \)

**Your Work:**

i. You must make your case for whatever statement you are making.
ii. Circle which of the following choices corresponds to your result.

a. Concavity-sign $f_{\mid x \to \infty} = (\cup, \cup)$

b. Concavity-sign $f_{\mid x \to \infty} = (\cup, \cap)$

c. Concavity-sign $f_{\mid x \to \infty} = (\cap, \cup)$

d. Concavity-sign $f_{\mid x \to \infty} = (\cap, \cap)$

e. None of the preceding

iii. Check the corresponding box in the **Response Grid** on the front page thus: [X]

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*Rck 13-3.* Let the function $f$ be specified by the global input-output rule

$$x \xrightarrow{f} f(x) = -40.47x^3 + 53.84x^2 - 28.36x + 48.03$$

what is Slope-sign $f_{\mid x \to \infty}$

**Your Work:**

i. You must make your case for whatever statement you are making.

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ii. Circle which of the following choices corresponds to your result.

a. Slope-sign $f_{\mid x \to \infty} = (\diagup, \diagup)$

b. Slope-sign $f_{\mid x \to \infty} = (\diagup, \diagdown)$

c. Slope-sign $f_{\mid x \to \infty} = (\diagdown, \diagup)$

d. Slope-sign $f_{\mid x \to \infty} = (\diagdown, \diagdown)$

e. None of the preceding
Your Work:

i. You must make your case for whatever statement you are making.

ii. Circle which of the following choices corresponds to your result.

   a. Height-sign \( f \mid_{\text{near } \infty} = (+, +) \)
   
   b. Height-sign \( f \mid_{\text{near } \infty} = (+, -) \)

   c. Height-sign \( f \mid_{\text{near } \infty} = (-, +) \)

   d. Height-sign \( f \mid_{\text{near } \infty} = (-, -) \)

   e. None of the preceding

iii. Check the corresponding box in the **Response Grid** on the front page thus: ✗

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**Rk 13-5.** Let the function \( f \) be specified by the global input-output rule

\[
x \xrightarrow{f} f(x) = -4x^3 + 3x^2 - 2x + 1
\]

find its local input-output rule for inputs near \( x_0 = -5 \)

**Your Work:**

i. You must make your case for whatever statement you are making.
ii. Circle which of the following choices corresponds to your result.

a. \( h \xrightarrow{\ f-5 \ } f_{-5}(h) = +586 - 332h + 63h^2 - 4h^3 \)
b. \( h \xrightarrow{\ f-5 \ } f_{-5}(h) = -125 + 75h - 15h^2 + h^3 \)
c. \( h \xrightarrow{\ f-5 \ } f_{-5}(h) = -104 + 66h - 14h^2 + h^3 \)
d. \( h \xrightarrow{\ f-5 \ } f_{-5}(h) = 1 - 2h + 3h^2 - 4h^3 \)
e. None of the preceding

iii. Check the corresponding box in the **Response Grid** on the front page thus: \( \blacksquare \).

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**Rck 13-6.** Let the function \( f \) be specified by the global input-output rule

\[
x \xrightarrow{f} f(x) = +2x^3 + 7x^2 - 16x - 5
\]

What is Height-sign \( f \mid_{\text{near } -5} \)?

**Your Work:**

i. You must make your case for whatever statement you are making.

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ii. Circle which of the following choices corresponds to your result.

a. Height-sign \( f \mid_{\text{near } -5} = (+, +) \)
b. Height-sign \( f \mid_{\text{near } -5} = (+, -) \)
c. Height-sign \( f \mid_{\text{near } -5} = (-, +) \)
d. Height-sign \( f \mid_{\text{near } -5} = (-, -) \)
e. None of the preceding
ii. Circle which of the following choices corresponds to your result.

a. Slope-sign \( f \big|_{x=4} = (\uparrow, \uparrow) \)

b. Slope-sign \( f \big|_{x=4} = (\uparrow, \downarrow) \)

c. Slope-sign \( f \big|_{x=4} = (\downarrow, \uparrow) \)

d. Slope-sign \( f \big|_{x=4} = (\downarrow, \downarrow) \)

e. None of the preceding

iii. Check the corresponding box in the Response Grid on the front page thus: \( \blacksquare \)
ii. Circle which of the following choices corresponds to your result.

a. Slope-sign \( f \mid_{\text{near } -4} = (\vee, \vee) \)  

b. Slope-sign \( f \mid_{\text{near } -4} = (\vee, \wedge) \)  

c. Slope-sign \( f \mid_{\text{near } -4} = (\wedge, \vee) \)  

d. Slope-sign \( f \mid_{\text{near } -4} = (\wedge, \wedge) \)  

e. None of the preceding

iii. Check the corresponding box in the **Response Grid** on the front page thus: \( \boxed{X} \).

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**Rck 13-9.** Let the function \( f \) be specified by the global input-output rule

\[
\begin{align*}
x & \quad \mapsto \quad f(x) = -x^3 - 15x^2 + 3x - 10
\end{align*}
\]

What is Concavity-sign \( f \mid_{\text{near } -5} \)?

**Your Work:**

i. You must make your case for whatever statement you are making.

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ii. Circle which of the following choices corresponds to your result.

a. Concavity-sign \( f \mid_{\text{near } -5} = (\cup, \cup) \)  

b. Concavity-sign \( f \mid_{\text{near } -5} = (\cup, \cap) \)  

c. Concavity-sign \( f \mid_{\text{near } -5} = (\cap, \cup) \)  

d. Concavity-sign \( f \mid_{\text{near } -5} = (\cap, \cap) \)  

e. None of the preceding
iii. Check the corresponding box in the Response Grid on the front page thus: \(\checkmark\)

\textbf{Rck 13-10.} Let the function \(f\) be specified by the global input-output rule
\[ x \xrightarrow{f} f(x) = -2x^3 + 10x^2 + 3x - 10 \]

What is Concavity-sign \(f \big|_{\text{near } 2}\)

\textbf{Your Work:}

i. You must make your case for whatever statement you are making.

ii. Circle which of the following choices corresponds to your result.

a. Concavity-sign \(f \big|_{\text{near } 2} = (\cup, \cup)\)  
b. Concavity-sign \(f \big|_{\text{near } 2} = (\cup, \cap)\)  
c. Concavity-sign \(f \big|_{\text{near } 2} = (\cap, \cup)\)  
d. Concavity-sign \(f \big|_{\text{near } 2} = (\cap, \cap)\)  
e. None of the preceding

iii. Check the corresponding box in the Response Grid on the front page thus: \(\checkmark\)

\textbf{Rck 13-11.} Let the function \(f\) be specified by the global input-output rule
\[ x \xrightarrow{f} f(x) = 2x^3 - 4x^2 - 2x + 4 \]

What is Local graph \(f \big|_{\text{near } 2}\)

\textbf{Your Work:}

i. You must make your case for whatever statement you are making.
ii. Circle which of the following choices corresponds to your result.

a. Local graph $f \mid_{\text{near} +2} = 

b. Local graph $f \mid_{\text{near} +2} = 

c. Local graph $f \mid_{\text{near} +2} = 

d. Local graph $f \mid_{\text{near} +2} = 

e. None of the preceding

iii. Check the corresponding box in the Response Grid on the front page thus: X.