Homework p95:55-62

In Exercises 55–62, use a method of your choice to find all horizontal and vertical asymptotes of the function.

55. $f(x) = \frac{x}{x-1}$ — H.A $y=1$, V.A $x=1$

56. $q(x) = \frac{x-1}{x}$ — V.A at $x=0$, H.A at $y=1$, same degree

57. $g(x) = \frac{x+2}{3-x}$ — H.A $y=-1$, V.A $x=3$

58. $q(x) = 1.5^x$ — exp. No V.A → No Rest. H.A $y=0$

59. $f(x) = \frac{x^2+2}{x^2-1}$ — H.A $y=1$, V.A $x=1$, $x=-1$ $(x-1)(x+1)$

60. $p(x) = \frac{4}{x^2+1}$ — H.A at $y=0$, V.A None

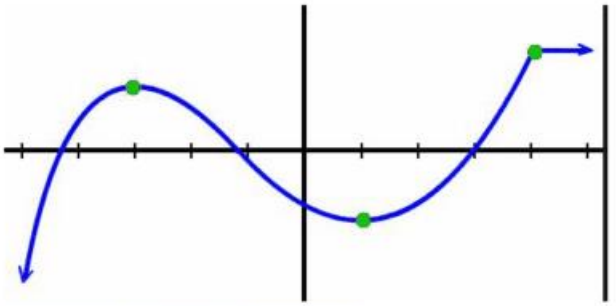
61. $g(x) = \frac{4x-4}{x^3-8}$ — $x \neq 2$, V.A at $x=2$, H.A at $y=0$

62. $h(x) = \frac{2x-4}{x^2-4} = \frac{2(x-2)}{(x-2)(x+2)}$ — H.A at $y=0$, V.A at ~~$x=2$~~ $x=-2$ yes; NO → hole at $x=2$

V.A x value $D=0$

Hole at x value both N and $D=0$

Local Extrema (Relative extrema)



DEFINITION Increasing, Decreasing, and Constant Function on an Interval

A function f is **increasing** on an interval if, for any two points in the interval, a positive change in x results in a positive change in $f(x)$.

A function f is **decreasing** on an interval if, for any two points in the interval, a positive change in x results in a negative change in $f(x)$.

A function f is **constant** on an interval if, for any two points in the interval, a positive change in x results in a zero change in $f(x)$.

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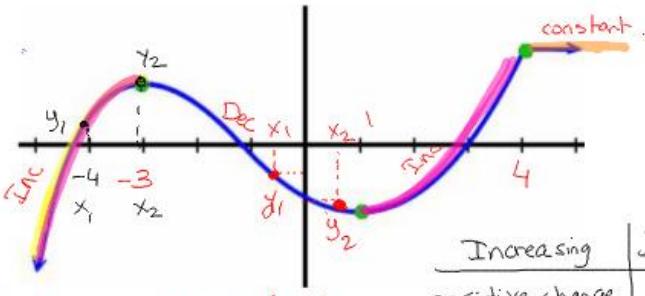
Increasing/Decreasing Intervals

definition p90. p87



Increasing $(-\infty, -3) \cup (1, 4)$

Decreasing $(-3, 1)$

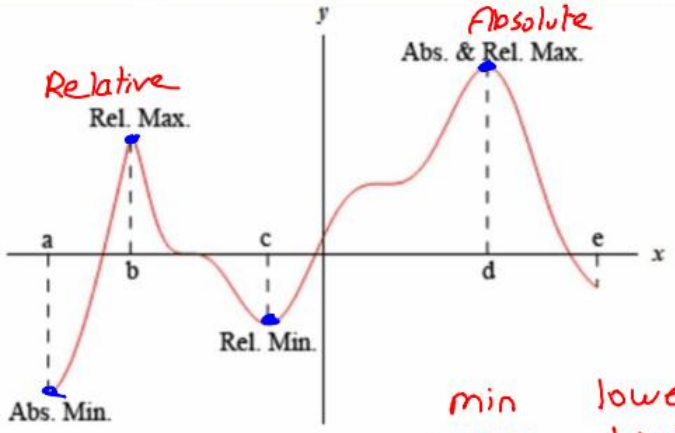
Constant $(4, \infty)$

Increasing	Decreasing
positive change of x ⇓ positive change of y	positive change of x ⇓ negative change of y
$x_2 > x_1$ $y_2 > y_1$	$x_2 > x_1$ $y_2 < y_1$

Extrema

Finding Max/Min Values

p90



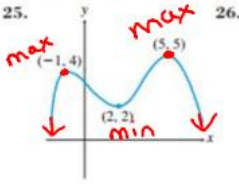
min lowest range value

max highest range value.

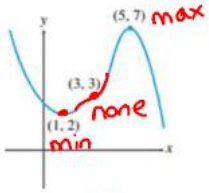
Definition p90

In Exercises 25–28, state whether each labeled point identifies a local minimum, a local maximum, or neither. Identify intervals on which the function is decreasing and increasing.

25.



26.



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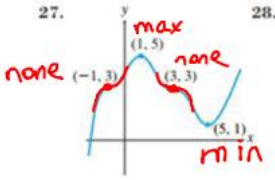
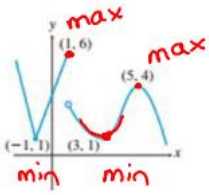
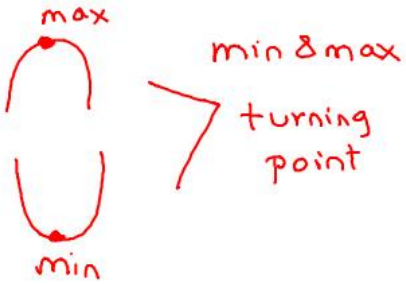
27.



28.





Homework

- P95 #41-46 Sketch the graph next to each equation. Label max/min. Write increasing/Decreasing Inteval.