Page 4

State whether each labeled point identifies a local minimum, a local maximum, or neither. Identify intervals on which the function is decreasing and increasing.

Local maximum

Local max

Local min

Local minimum

List the x-values ← Increasing $(-\infty,-3) \cup (-1,2) \cup (4,\infty)$

Left Right

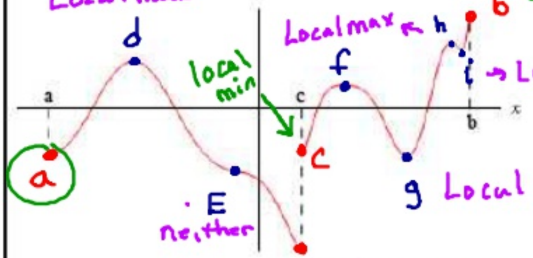
Decreasing: $(-3,-1) \cup (2,4)$

Local max

Local max ← h

b ← local max

Absolute Max



→ Local min

Local min → a

g Local min

c → Local min → Absolute Min

Inc: $(a,d) \cup (c,f) \cup (g,h) \cup (i,b)$

Dec: $(d,c) \cup (f,g) \cup (h,i)$

Graph the function and identify intervals on which the function is increasing, decreasing or constant.

30) $f(x)=|x+1|+|x-1|-3$

33) $g(x) = 3-(x-1)^2$

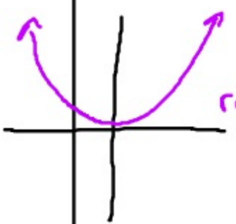
Use your calculator to find all local maxima and minima and the values of x where they occur.

43. $h(x) = -x^3 + 2x - 3$

45) $f(x)=x^2\sqrt{x+4}$

State whether the function is odd, even, or neither. Support graphically and confirm algebraically.

A) $f(x)=4x^2$



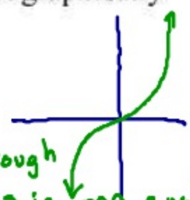
reflection over the y-axis

Even

$f(-1)=4(-1)^2=4\cdot 1=4$

$f(1)=4(1)^2=4\cdot 1=4$

B) $f(x)=3x^3$



Odd → goes through origin and is in opp quad

$f(-1)=3(-1)^3=-3$

$f(1)=3(1)^3=3$

C) $f(x)=\sqrt{x^4+1}$

$f(-1)=\sqrt{(-1)^4+1}=\sqrt{1+1}=\sqrt{2}$

$f(1)=\sqrt{1^4+1}=\sqrt{1+1}=\sqrt{2}$

even

D) $f(x)=4x+x^3$

$f(-1)=4(-1)+(-1)^3=-4+(-1)=-5$

$f(1)=4(1)+(1)^3=4+1=5$

odd

E) $f(x)=4x+x^2$

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Vertical Asy

- Bottom = 0

- Plug in to check for hole

Horizontal Asy

* If the powers are the same divide the leading coefficients

* If the highest power on bottom is bigger H.A. $y=0$

* Top power is bigger there is no H.A.

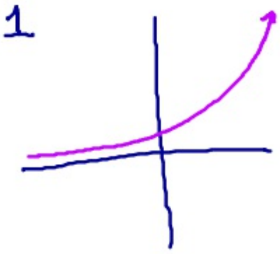
Find all horizontal and vertical asymptotes

A) $f(x)=\frac{x+1}{x}$

$x=0$ V.A.

$y=\frac{x}{x}=1$ H.A.

B) $\boxed{f(x)=2^x}$ exponential



H.A $y=0$

C) $\boxed{f(x)=\frac{-3x^2+1}{x^2-1}}$

VA: $x^2-1=0$

$x^2=1$

$x=\pm 1$

H.A. $y=\frac{-3x^2}{x^2}$

$y=-3$

$f(1)=\frac{-2}{0}$ VA

$f(-1)=\frac{-2}{0}$ V.A.

D) $\boxed{f(x)=\frac{3x-9}{x^2-9}}$

V.A: $x^2-9=0$

$+9\ +9$

$x^2=9$

$x=\pm 3$

H.A.

$y=\frac{3x}{x^2}$

$y=0$

$f(3)=\frac{0}{0}$ Hole

$f(-3)=\frac{-18}{0}$ V.A.

E) $f(x)=\frac{3x^3+3}{x^2+1}$

VA: $x^2+1=0$

$x^2\neq -1$

No V.A.

end behavior model

$y=\frac{3x^3}{x^2}$

No H.A.

F) $f(x)=\frac{x+5}{x^3-27}$

VA: $x^3-27=0$

$x^3=27$

$x=3$

$\boxed{\text{HA. } y=0}$

$y=\frac{x}{x^3}$

end behavior model