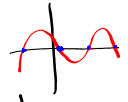


Curve Sketching

Given $y = f(x)$. Sketch a graph of the function.

- ① Domain
- ② x-intercepts:  Set $f(x) = 0$ solve for x.
y-intercept:  Put $x = 0$ in the formula $f(x)$ to obtain y.
- ③ V.A. (Vertical Asymptote)
- ④ H.A. (Horizontal Asymptote) (Take $\lim_{x \rightarrow \infty} f(x)$ or $\lim_{x \rightarrow -\infty} f(x)$)

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④ Determine intervals of increasing/decreasing f'

Determine intervals of concavity f''

Find values of x at which $f' = 0$ or f' is undefined $f'' = 0$ or f'' is undefined

x	
f'	
f''	
f	

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E.g. $f(x) = (x^5 - 5x)$ Sketch a graph of f .

- ① Domain: $\mathbb{R}$.
- ② x-intercepts? $x^5 - 5x = 0$
 $x \cdot (x^4 - 5) = 0$
 $x = 0$ or $x^4 = 5$; $x = \sqrt[4]{5} \approx 1.5$
 $x = -\sqrt[4]{5} \approx -1.5$
y-intercept: Put $x = 0$ in the formula $y = 0$
- ③ V.A. None.
- ④ H.A. None.
- ⑤ Intervals of increasing/decreasing/concavity

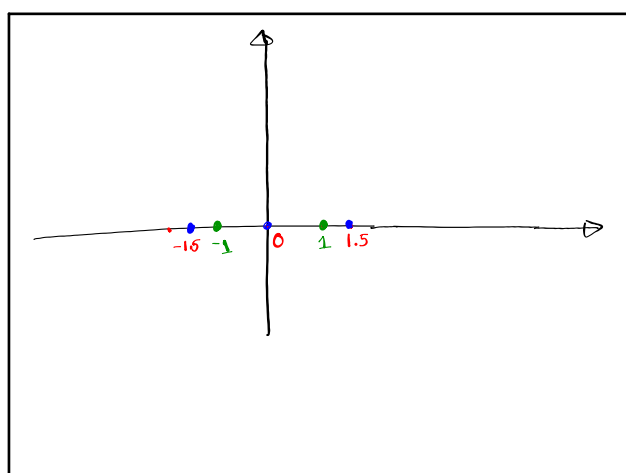
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$f(x) = x^5 - 5x$; $f'(x) = 5x^4 - 5$; $f''(x) = 20x^3$

* Special values of x : ± 1 ; 0

x	$-\infty$	-1	0	1	∞
f'	+	0	-	0	+
f''	-	-	0	+	+
f		rel max	inflection pt	rel min	

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