DO NOW

Pick up Classwork 4.6.
Complete the front side.

4.6 Summary of Curve Sketching

Methods to analyze the graph of a function include:

x-intercepts	domain and range
y-intercepts	symmetry
continuity	differentiability
vertical asymptotes	horizontal asymptotes
relative extrema	increasing/decreasing
points of inflection	concavity
infinite limits at infinity	

Procedure:

1. Find first and second derivatives.

2. Identify the x and y-intercepts, domain, symmetry, horizontal and vertical asymptotes.

x-intercepts → $y=0$, solve for x
y-intercepts → $x=0$, solve for y
domain → watch for denom $=0$ or $\sqrt{\text{negatives}}$
Vertical asymptotes → denom $=0$
horizontal asymptotes → $\lim_{x\to\infty}$ or $\lim_{x\to-\infty}$
Symmetry: x-axis: $-f(x)=f(x)$ or replace y with $-y$
y-axis: $f(x)=f(-x)$ or replace x with $-x$
origin: $-f(x)=f(-x)$ or place x and y with $-x$ and $-y$

Back side of Worksheet CW 4.6

9. $f(x)=\frac{x}{x^2-9}$

x-intercepts: $(0,0)$
y-intercepts: $(0,0)$
domain: $(-\infty,-3)\cup(-3,3)\cup(3,\infty)$
Vertical asymptotes: $x=-3$ and $x=3$
horizontal asymptotes: $y=0$
Symmetry: x-axis: no
y-axis: no
origin: yes

10. $f(x)=\frac{2x+1}{3x}$

x-intercept: $(-\frac{1}{2},0)$
y-intercept: none
domain: $(-\infty,0)\cup(0,\infty)$
Vertical asymptotes: $x=0$
horizontal asymptotes: $y=\frac{2}{3}$
Symmetry: x-axis: no
y-axis: no
origin: no

3. Identify the critical numbers and possible points of inflection.

Critical #'s
↳ 1st derivative is zero or undefined
possible points of inflections
↳ 2nd derivative is zero or undefined

On HW worksheet:

1. Find 1st and 2nd derivatives
2. Identify x-intercepts etc.
3. Find critical #'s and possible points of inflections

HOMEWORK

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Worksheet HW 4.6