Math 1431

Section 16679

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Office Hours: Tuesdays & Thursdays 11:45-12:45
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Questions

Asymptote review: Find any horizontal and/or vertical asymptotes.

1. $f(x) = \dfrac{1}{x^2+1}$

2. $f(x) = \dfrac{2x^2+x-7}{5x^2-1}$

3. $f(x) = \dfrac{2x-7}{x^2-1}$

Asymptote review: Find any horizontal and/or vertical asymptotes.

4. $f(x) = \dfrac{7x^3 + 2}{6x^2 - 5}$

5. $f(x) = \dfrac{3x^5 + 2x}{4x^5 - 1}$

6. $f(x) = \dfrac{4x}{\sqrt{x^2 + 9}}$

Popper 11

1. Find the vertical and horizontal asymptotes $f(x) = \frac{2x}{\sqrt{4x^2+1}}$.

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2. Find the vertical and horizontal asymptotes $f(x) = \frac{x}{4x^2-1}$.

Section 3.6 - Curve Sketching

Assume that f is continuous at $x = c$ and differentiable for $x \neq c$.

A vertical tangent exists at $(c, f(c))$ if as $x \to c$ then $f'(x) \to \infty$ or $f'(x) \to -\infty$.

Example: $f(x) = x^{1/3}$

Assume that f is continuous at $x = c$ and differentiable for $x \neq c$.

A vertical cusp exists at $(c, f(c))$ if as $x \to c^-$ then $f'(x) \to -\infty$ and as $x \to c^+$ then $f'(x) \to \infty$.

Or, if as $x \to c^-$ then $f'(x) \to \infty$ and as $x \to c^+$ then $f'(x) \to -\infty$.

Example: $f(x) = 5 + (x-3)^{2/7}$

Popper 11

3. Determine whether or not the graph of f has a vertical tangent or a vertical cusp at $c = 2$.

$$f(x) = 4 - (2 - x)^{\frac{3}{7}}$$

Examples of using calculus to graph functions:

1. $f(x) = (2 - x)^{4/5}$

2. $f(x) = x(x-1)^{1/3}$

3. $f(x) = -4x^3 - 6x^2 + 24x + 12$

5. $f(x)$ has domain of $[1,2) \cup (2,6]$, $f(1)=2,\ f(3)=0,\ f(6)=4$, $\lim\limits_{x\to 2^-} f(x) = -\infty$ and $\lim\limits_{x\to 2^+} f(x) = -\infty$
$f'(x) < 0$ on $(1,2)$ and $f'(x) > 0$ on $(2,6)$,
$f''(x) < 0$ on $(1,2)$ and $f''(x) < 0$ on $(2,6)$

Popper 11

4. If $\lim_{x \to -\infty} g(x) = 6$ then the graph of $g(x)$ has a

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5. If $\lim_{x \to 6+} g(x) = -\infty$ then the graph of $g(x)$ has a