

Set 4.3

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#45)
$$T(x) = y = \frac{x^3}{x^2-1} = \frac{x^3}{(x^2-1)(x^2+1)} = \frac{x^3}{(x-1)(x+1)(x^2+1)}$$

1. Denominator $x^2-1 \neq 0$
 $(x-1)(x+1)(x^2+1) \neq 0$

$x-1 \neq 0$ $x \neq 1$	$x+1 \neq 0$ $x \neq -1$	$x^2+1 \neq 0$ $x^2 = -1 \Rightarrow x = \pm i$
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Don't worry about imaginary roots

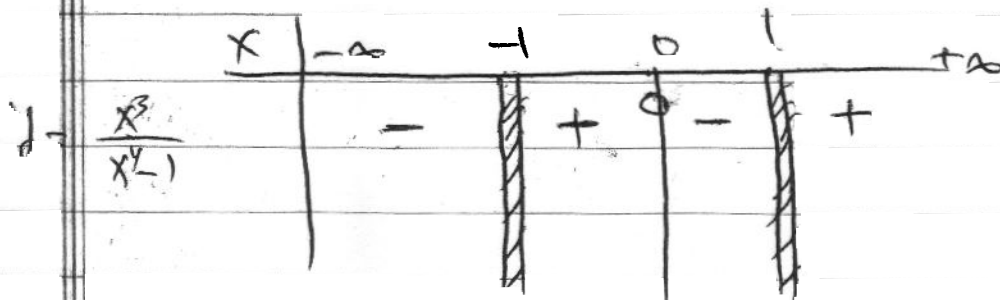
Domain: $x \in (-\infty, -1) \cup (-1, +1) \cup (1, +\infty)$

2. $x=0, (0,0)$
 $y=0 \Rightarrow x^2=0 \Rightarrow x=0, (0,0)$

3. As $x \rightarrow -1, y \rightarrow \pm \infty$; $x=-1$ Asymptote
 As $x \rightarrow +1, y \rightarrow \pm \infty$; $x=1$ "

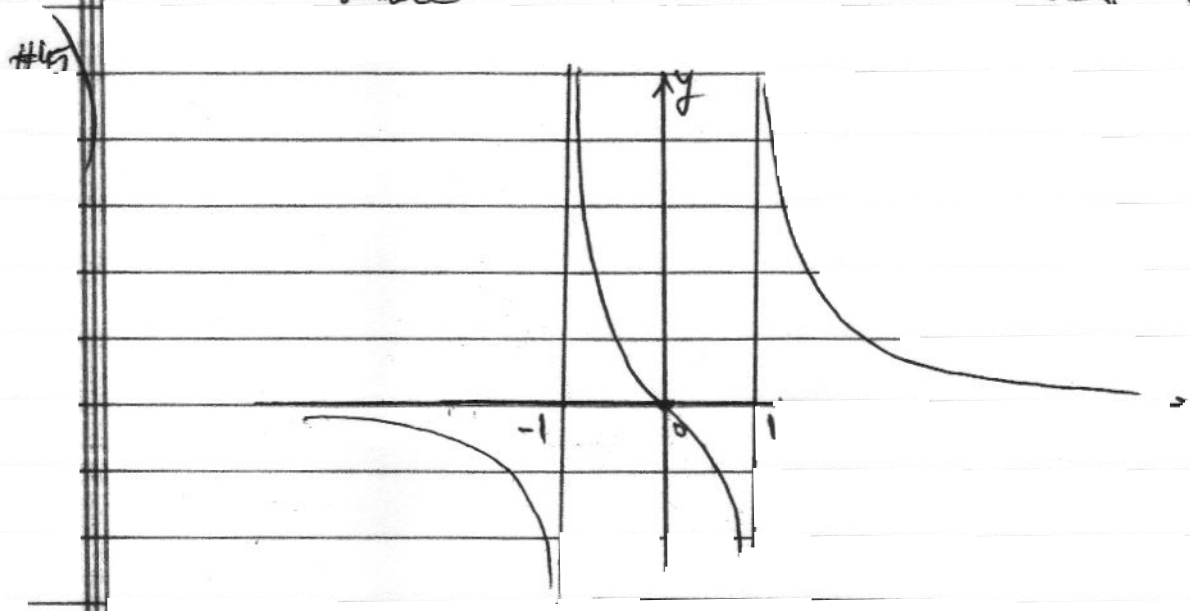
As $x \rightarrow \pm \infty, y \rightarrow 0$; $y=0$ "

4. Critical pts $x=0, \pm 1$



Costume

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1.5)
$$y = \frac{6x^2 + x + 2}{3x^2 - 5x - 2} = \frac{6x^2 + x + 2}{(3x + 1)(x - 2)}$$

1. II) DOKAL. $(3x + 1)(x - 2) \neq 0$

$3x + 1 \neq 0$	$x - 2 \neq 0$
$x \neq -1/3$	$x \neq 2$

II) $x \in (-\infty, -1/3) \cup (-1/3, 2) \cup (2, +\infty)$

2. $x = 0, y = -6, (0, -6)$
 $y \neq 0$ because $6x^2 + x + 2 \neq 0$
 because $b^2 - 4ac = 1^2 - 4 \cdot 6 \cdot 2 < 0$
 \Rightarrow Imaginary Roots.

As $x \rightarrow -1/3, y \rightarrow \pm\infty$; $x = -1/3$ Asymptote
 As $x \rightarrow 2, y \rightarrow \pm\infty$; $x = 2$ Asymptote

As $x \rightarrow +\infty, y \rightarrow 2$; $y = 2$ Asymptote

Continue

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5) 4. Critical Pts Numerator $\neq 0$
 $x = -1/3, 2$ are the only C.P.

