Asymptotes

6. $p(x) = \dfrac{x^6 + x^3 - 4}{1 + 2x^4}$

Vertical

None

$1 + 2x^4 = 0$

$\cancel{2}x^4 = \dfrac{-1}{\cancel{2}}$

$\sqrt[4]{x^4} = \sqrt[4]{-\frac{1}{2}}$

Horiz

$\lim\limits_{x\to\infty} \dfrac{x^{\cancel{6}\,2}}{2\cancel{x^4}} = \lim\limits_{x\to\infty} \dfrac{1x^2}{2}$

$= \dfrac{\infty^2}{2} = \infty$

---

7. $f(x) = \dfrac{1-6x^2}{\sqrt[3]{x^9-1}}$

Vertical

$x^9 - 1 = 0$

$x^9 = 1$

$x = 1$

$\lim\limits_{x\to 1^+} \dfrac{1-6x^2}{\sqrt[3]{x^9-1}} = \dfrac{-5}{0}$

$= \dfrac{-}{+} = \boxed{-\infty}$

$\boxed{x = 1}$

Horiz

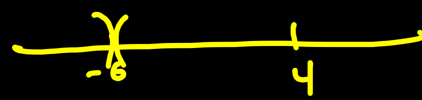
$\lim\limits_{x\to\infty} \dfrac{-6x^2}{\sqrt[3]{x^9}}$

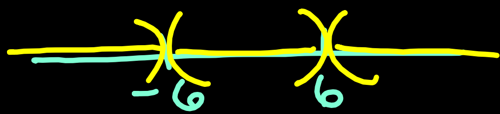
$\lim\limits_{x\to\infty} \dfrac{-6\cancel{x^2}}{x^{\cancel{3}}} = \dfrac{-6}{\infty} = 0$

$\boxed{y = 0}$

6/ $g(x) = \dfrac{x+6}{x^2-36}$ $(-\infty, 4]$

$x = -6, 6$





7/ $h(x) = \dfrac{4x-3}{16x^2-9}$

$16x^2 - 9 = 0$

$16x^2 = 9$

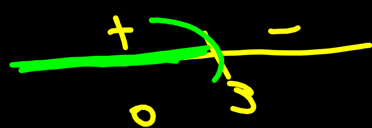
$\sqrt{x^2} = \sqrt{\frac{9}{16}}$

$x = \pm 3/4$

$(-3/4, \infty)$

D

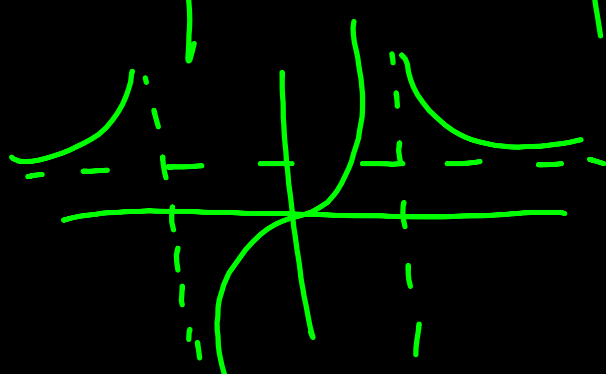
8 $K(x) = \dfrac{x}{\sqrt{3-x}}$



1) $f(\ ) = \#$

2) $\lim\limits_{x \to}$

3) $f(x) = \lim\limits_{x \to}$



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LIMITS

1) Graph – Give y-coord.

2) $\lim_{x \to 5} \frac{3x}{10-2x} = \frac{15}{0} = \text{DNE}$

$\lim_{x \to 5^-} \frac{3x}{10-2x} = \frac{15}{0} = \frac{+}{+} = +\infty$

$\lim_{x \to 5^-} \frac{3x}{10-2x} = \frac{+}{+} = +\infty$

$\lim_{x \to 5^+} \frac{3x}{10-2x} = \frac{+}{-} = -\infty$

3) $\lim_{x \to -\infty} \frac{\sqrt{x^2+3}}{5-x} = \lim_{x \to -\infty} \frac{\sqrt[2]{x^2}}{-x} = \lim_{x \to -\infty} \frac{|x|}{-x}$

$= \lim_{x \to -\infty} \frac{-x}{-x} = 1$

$$\lim_{x\to 0} \frac{\sin nx}{nx} = 1 \qquad \lim_{x\to 0} \frac{1-\cos nx}{nx} = 0$$

$$\lim_{x\to \infty} e^{x} = +\infty \qquad \lim_{x\to \infty} \ln x = +\infty$$

$$\lim_{x\to -\infty} e^{x} = 0 \qquad \lim_{x\to 0^+} \ln x = -\infty$$