

Try:

$$3(x-5)$$

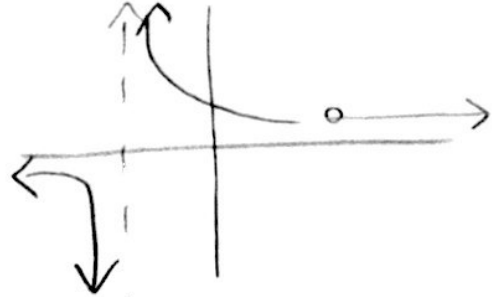
(3) Given  $f(x) = \frac{3x-15}{x^2-25}$ , find the vertical asymptote(s) and justify using limits.

$$(x+5)(x-5)$$

$$x = -5$$

$$\lim_{x \rightarrow -5^+} \frac{3}{x+5} = \infty$$

$$\lim_{x \rightarrow -5^-} \frac{3}{x+5} = -\infty$$



14) Given  $f(x) = \frac{3x-2}{\sqrt{2x^2+1}}$ , find the horizontal asymptote(s) and justify using limits.

$$\frac{3x-2}{\sqrt{2x^2+1}}$$

$$y = \pm \frac{3}{\sqrt{2}} = \pm \frac{3\sqrt{2}}{2} \text{ graph}$$

$$\lim_{x \rightarrow \infty} f(x) = \frac{3x}{\sqrt{2} \cdot x} = \frac{3}{\sqrt{2}} = \frac{3\sqrt{2}}{2}$$

$$\lim_{x \rightarrow -\infty} f(x) = \frac{3(-\infty)}{\sqrt{2(-\infty)^2}} = \frac{-3}{\sqrt{2}} = -\frac{3\sqrt{2}}{2}$$

Evaluate Other Limits Involving Infinity (no calculator!):

15)  $\lim_{x \rightarrow 1^-} \frac{2+x}{1-x} =$

small

$$\infty$$

16)  $\lim_{x \rightarrow 0^+} x^2 - \frac{1}{x} =$

$$\lim_{x \rightarrow 0^+} (x^2) - \lim_{x \rightarrow 0^+} \left(\frac{1}{x}\right)$$

small                      small } big

$$0 - \infty$$

$$-\infty$$

17)  $\lim_{x \rightarrow 1^+} \frac{x^2+1}{x-1} =$

big }  
small

$$\lim_{x \rightarrow 1^+} \frac{x^2+1}{x-1} = \frac{2}{0}$$

$$\lim_{x \rightarrow 1^+} \frac{1}{x-1} = \text{big}$$

small

$$\infty$$

18)  $\lim_{x \rightarrow 2^+} \frac{3}{x-2} =$

big }  
small

$$\infty$$