6. $\lim_{(x,y)\to(0,0)} (\arcsin(x-y))$

$= \arcsin(0-0)$

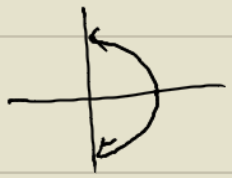
$= \arcsin 0$

$p = \arcsin 0$

$\sin p = \sin(\arcsin 0)$

$\sin p = 0$

$p = 0$



$y = \sin x$ $\quad -1 \le y \le 1$ $\quad -\frac{\pi}{2} \le x \le \frac{\pi}{2}$

$y = \arcsin x$ $\quad -1 \le x \le 1$ $\quad -\frac{\pi}{2} \le y \le \frac{\pi}{2}$

so

$-1 \le x-y \le 1$

$|x-y| \le 1$

CONT: $\{(x,y) \mid |x-y| \le 1\}$

7. $\lim_{(x,y)\to(0,0)} \left(\frac{x^2-9y^2}{x-3y}\right)$

$\lim_{(x,y)\to(0,0)} \left(\frac{(x+3y)(x-3y)}{x-3y}\right)$

$\lim_{(x,y)\to(0,0)} x+3y$

$= 0+3(0)$

$= 0$

CONT.

$x-3y=0$

$x=3y$

$\{(x,y) \mid x \neq 3y\}$

8. $\lim_{(x,y)\to(0,0)} \left(\sqrt{x}\sqrt{y}\right)$

DOES NOT EXIST

9. $\lim_{(x,y)\to(0,0)} \frac{1+y}{x+y}$

$= \lim_{(x,y)\to(0,0)} \frac{1}{x}$

DOES NOT EXIST