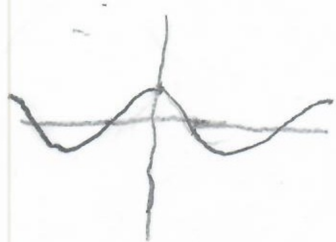
3. (2 pts) Give the standard domains and ranges of

a. $\arccos(x)$

D: $[-1, 1]$

R: $[0, \pi]$





b. $\arctan(x)$

D: $(-\infty, \infty)$

R: $\left(-\frac{\pi}{2}, \frac{\pi}{2}\right)$

2. (2 pts) Use the given values to find $(f^{-1})'(a) : f(\pi) = 0, f'(\pi) = -1, a = 0.$

$$(f^{-1})'(a) = \frac{1}{f'(f^{-1}(a))}$$

$$f(\pi) = 0$$

$$f(\pi) = a$$

$$f^{-1}(a) = \pi$$

$$(f^{-1})'(a) = \frac{1}{f'(\pi)}$$

$$(f^{-1})'(a) = -1$$

1. (2 pts) Find $\frac{dy}{dx}$ for $y = \tan^{-1}(x^2)$

$$\frac{dy}{dx} = \frac{1}{1 + (x^2)^2}(2x)$$

$$\boxed{= \frac{2x}{1 + x^4}}$$

2. (2 pts) Use the given values to find $(f^{-1})'(a) : f(\pi) = 0, f'(\pi) = -1, a = 0.$

$$(f^{-1})'(a) = \frac{1}{f'(f^{-1}(a))}$$

$$(f^{-1})'(0) = \frac{1}{-1}$$

$$(f^{-1})'(0) = -1$$

good

4. (4 pts) Each of the following functions **could** be invertible on its domain. Specify any conditions to each that will ensure that it is or becomes invertible on the greatest domain possible, and specify an appropriate domain.

~/

a. $\frac{1}{x^n}$ $\quad n \in \mathbb{N}$

$\frac{1}{x^2}$

invertible because it is one-to-one,

Domain $= (-\infty, \infty)$ ✓

$x \neq 0$

$\frac{1}{x^3}$

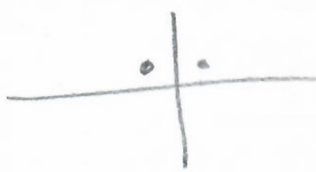
When $n$ is odd

it is not one to one when $n$ is an even number,

good

$\frac{1}{x}$ = invertible

$\frac{1}{x^2}$ is



OR if $n$ is all numbers, restrict domain to $(0, \infty)$ to make it one to one & invertible

b. $\frac{ax+b}{cx+d}$ $\quad c \neq 0$

invertible when one-to-one.

Yes. ~

-1

$a \neq c$ when $b = d$

$b \neq d$ when $a = c$

Domain: $(-\infty, \infty)$

$x \neq \frac{-d}{c}$