# MAT229 Quiz 02, Spring 2025

**Name:**

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

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

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

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

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

$f(\pi) = 0$

$f(\pi) = a$

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

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

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

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

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

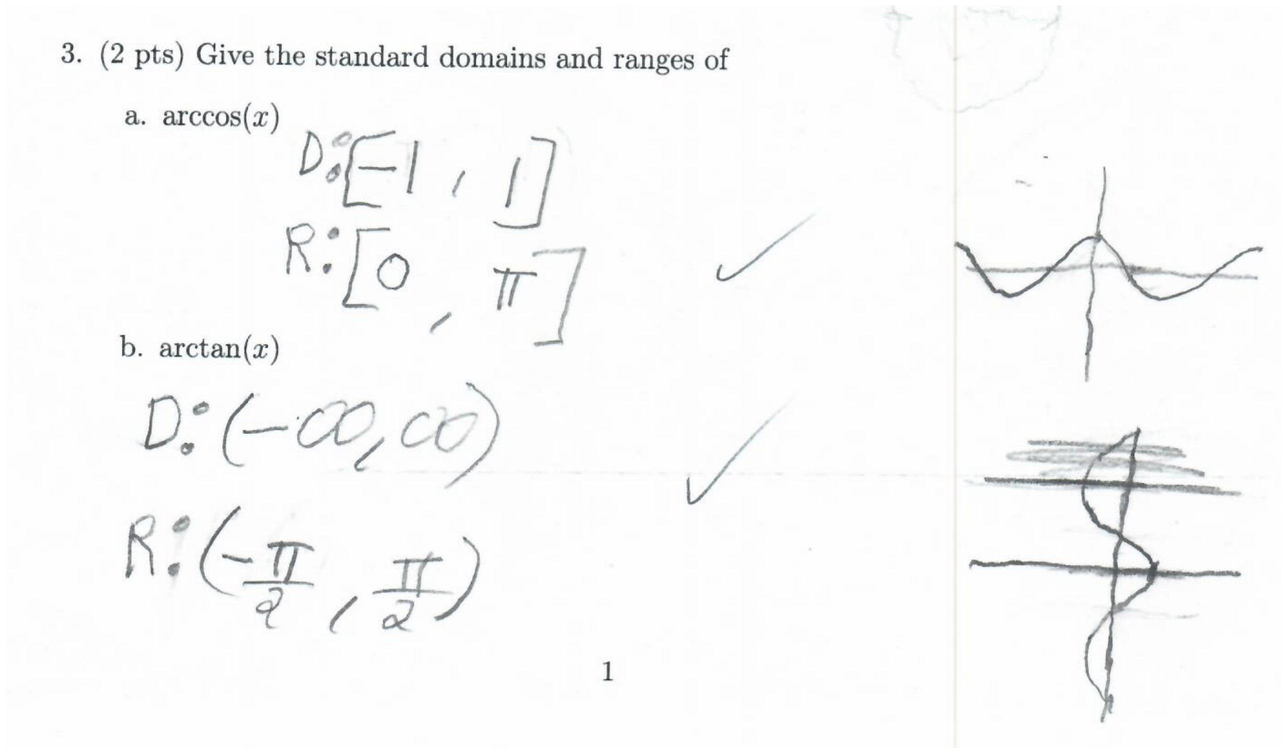
$$(f^{-1})'(0) = \frac{1}{-1}$$

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

good

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

a. $\arccos(x)$



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

1

b. $\arctan(x)$

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. $\dfrac{1}{x^n}$ $\qquad n \in \mathbb{N}$

b. $\dfrac{ax+b}{cx+d}$ $\qquad c \neq 0$

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

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

invertible because it is one-to-one,

Domain = $(-\infty, \infty)$ ✓

$x \neq 0$

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

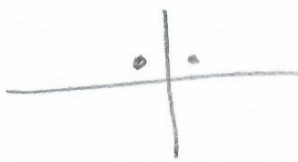
When n is odd

good

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

$\frac{1}{x}$ = 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. $\frac{ax+b}{cx+d}$ $c \neq 0$

invertible when one-to-one.

Yes. –

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

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

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

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