Review

The following are both true: $\tan\left(-\frac{\pi}{3}\right) = -\sqrt{3}$ and $\tan\left(\frac{2\pi}{3}\right) = -\sqrt{3}$

The value $\tan^{-1}(-\sqrt{3})$ is

(a) $\frac{2\pi}{3}$

(b) $-\frac{\pi}{3}$

(c) $\frac{2\pi}{3}$ and $-\frac{\pi}{3}$

(d) None of the above

The range for $y = \tan^{-1}x$

$-\frac{\pi}{2} < y < \frac{\pi}{2}$

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

for $y = \cos^{-1}x$ $\quad 0 \le y \le \pi$

True or False

If b is any real number, then

$$-b < 0 \quad \text{and} \quad b > 0.$$

False. If b is positive these inequalities hold, but if b is negative they don't.

Let $f(x) = \dfrac{|x|}{x^2 + 1}$.

Evaluate $f(-3)$.

(a) $f(-3) = -\dfrac{3}{10}$.

(b) $f(-3) = \dfrac{1}{4}$.

(c) $f(-3) = \dfrac{3}{10}$.

$$f(-3) = \frac{|-3|}{(-3)^2 + 1} = \frac{3}{10}$$

(d) $f(-3) = \dfrac{3}{4}$.

Let $f(x) = \dfrac{|x|}{x^2 + 1}$.

Evaluate $f(y)$

(a) $f(y) = \dfrac{y}{y^2 + 1}$

(b) $f(y) = \dfrac{1}{y + 1}$

(c) $f(y) = \dfrac{1}{y} + \dfrac{y}{1}$

(d) $f(y) = \dfrac{|y|}{y^2 + 1}$

$$f(☺) = \frac{|☺|}{☺^2 + 1}$$

Let $f(x) = \dfrac{|x|}{x^2+1}$.

Evaluate $f(-\alpha)$ where α is some real number

$$f(-\alpha) = \frac{|-\alpha|}{(-\alpha)^2+1}$$

(a) $f(-\alpha) = -\dfrac{\alpha}{\alpha^2+1}$

(b) $f(-\alpha) = \dfrac{1}{\alpha+1}$

$-\alpha = -1\alpha$ $\qquad |-1\alpha| = |-1||\alpha|$

$= |\alpha|$

(c) $f(-\alpha) = \dfrac{\alpha}{\alpha^2+1}$

(d) $f(-\alpha) = \dfrac{|\alpha|}{\alpha^2+1}$

$(-\alpha)^2 = (-\alpha)(-\alpha) = \alpha^2$

Let $f(x) = \dfrac{|x|}{x^2 + 1}$.

try to solve

$x^2 + 1 = 0$

$x^2 = -1$

$x = \pm\sqrt{-1}$ not real!

The domain of f is implied to be

(a) $(-\infty, \infty)$

(b) $(-\infty, 0) \cup (0, \infty)$

(c) $(-\infty, -1) \cup (-1, 1) \cup (1, \infty)$

(d) can't be determined from the information given.

Recall $\cos\left(\frac{x}{2}\right) = \pm\sqrt{\frac{1+\cos(x)}{2}}$

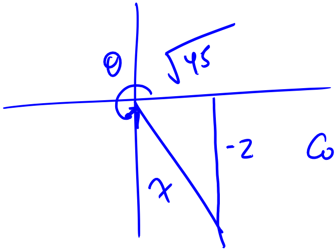
If $\frac{3\pi}{2} < \theta < 2\pi$ and $\sin\theta = -\frac{2}{7}$, then $\cos\left(\frac{\theta}{2}\right) = \cancel{\pm} - \sqrt{\frac{1+\sqrt{45}/7}{2}}$

(a) $\pm\sqrt{\frac{7+\sqrt{45}}{14}}$

(b) $-\sqrt{\frac{7+\sqrt{45}}{14}}$

(c) $\sqrt{\frac{7+\sqrt{45}}{14}}$

(d) $\frac{\sqrt{45}}{14}$



$\cos\theta = \frac{\sqrt{45}}{7}$

$\frac{1}{2}\left(\frac{3\pi}{2}\right) < \frac{1}{2}\theta < (2\pi)\cdot\frac{1}{2}$

$\frac{3\pi}{4} < \frac{\theta}{2} < \pi$ $\quad \frac{\theta}{2}$ is quad II

Logarithm Properties

Which of the following are legitimate Logarithm Properties?

(a) $\log_a(x) + \log_a(y) = \log_a(x+y)$ F $\log_a x + \log_a y = \log_a(xy)$

(b) $\log_a(x) - \log_a(y) = \log_a \frac{x}{y}$ T

(c) $r\log_a(x) = \log_a(x^r)$ T

(d) $r\log_a(x) = \log_a(rx)$ F

(e) $\log_a(x) = \dfrac{\log_b(x)}{\log_b(a)}$ T change of base

Domain and Range

Identify the domain and range of $y = \sin x$.

Domain $(-\infty, \infty)$

Range $[-1, 1]$

Identify the domain and range of $y = \sin^{-1} x$.

domain $[-1, 1]$

range $[-\pi/2, \pi/2]$

Linear Systems

Solve the system of equations if possible.

$$\begin{array}{rcrcl} 2x & - & 3y & = & 1 \\ \frac{3}{2} & + & \frac{9}{2}y & = & 3x \end{array}$$

(a) the system is inconsistent, there are no solutions

(b) $x = 1$, $y = \dfrac{3}{2}$

(c) $x = 2$, $y = 1$

(d) The solutions are all (x, y) such that $y = \frac{2}{3}x - \frac{1}{3}$, for $-\infty < x < \infty$

Let $f(x) = \dfrac{2}{x-3}$

Then $\dfrac{f(x+h) - f(x)}{h}$ is

$$\frac{f(x+h) - f(x)}{h} = \frac{\frac{2}{x+h-3} - \frac{2}{x-3}}{h}$$

(a) $-\dfrac{2}{(x+h-3)(x-3)}$

(b) 1

(c) $\dfrac{2x+2h}{(x+h)(x-3)}$

(d) $\dfrac{2}{h-3}$

simplify

from here