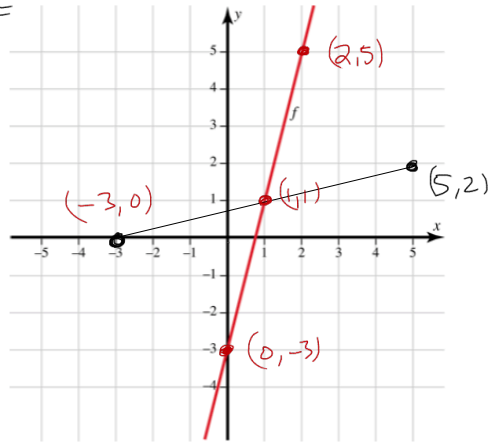


HW 1.5

Question 2 of 13

Let f be the function in the given graph. Find f^{-1} , the inverse of f .



Hints,

(1) $f(x)$ is linear $\Rightarrow f^{-1}(x)$ is linear too!

(2) Inverse fcn of $f(x)$ whose graph is the set $(x, f(x))$, has a graph $(f(x), x)$

(3) Find line thru $(5, 2) \perp (-3, 0)$

$$m = \frac{2 - (0)}{5 - (-3)} = \frac{2}{8} = \frac{1}{4}$$

$$y - 2 = \frac{1}{4}(x - 5) \quad \boxed{f^{-1}(x) = \frac{1}{4}x + \frac{3}{4}}$$

$$y = \frac{1}{4}x - \frac{5}{4} + \frac{2 \cdot 4}{4}$$

1.5.10

$$v(R) = \sqrt{\frac{2GM}{R}}$$

v

Inverse:

$$\frac{v^2}{1} = \frac{2G \cdot M}{R}$$

cross-multiply

$$R \cdot v^2 = 1 \cdot 2 \cdot G \cdot M$$

$$R = \frac{2 \cdot G \cdot M}{v^2}$$

1.3.1

$$f(t) = \frac{4}{\sqrt{t}} \text{ and } \underline{g(t)} = -t^2$$

$$f \circ g(t) = f(g(t)) = \frac{4}{\sqrt{g(t)}} = \frac{4}{\sqrt{-t^2}}$$

domain: can't \div by 0, $-0^2 = 0 \Rightarrow$ Exclude 0
can't $\sqrt{\text{neg.}}$ \Rightarrow Exclude everything

$$g \circ f(t) = g(f(t)) = -\left(\frac{4}{\sqrt{t}}\right)^2 = -\frac{16}{t}$$

\downarrow
domain = $(0, \infty)$

intersect
 $\Rightarrow (0, \infty)$

result \Rightarrow

Domain =
 $(-\infty, 0) \cup (0, \infty)$

1.5, 1.3

* \Rightarrow QI \sim QII

$\tan[\sec^{-1}(-10)]$

II | I
-1

cos θ

vs

I | I
-1

sin θ

angle θ

sec $\theta = -10$

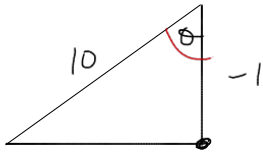
1 " = hyp
cos θ = adj

compute trig / inv. trig by hand.

keys

- ① inverse trig fns give angles
- ② these angles can be in Δ
- ③ the Δ has to relate to what inv. trig takes in

the angle $\sec^{-1}(-10)$ has its secant = -10



$$\sec \theta = \frac{\text{hyp}}{\text{adj}} = \frac{10}{-1}$$

$3\sqrt{11} = x$ figure this via Pyth Thm

$$x^2 + (-1)^2 = 10^2$$

$$x = \pm \sqrt{100 - 1} = \pm \sqrt{99}$$

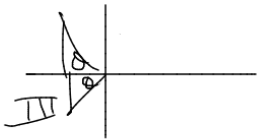
$$= +\sqrt{99} = 3\sqrt{11}$$

$$\Rightarrow \tan \theta = \frac{\text{opp}}{\text{adj}} = \frac{\pm \sqrt{99}}{-1} =$$

$$\Rightarrow \tan \theta = \frac{\text{opp}}{\text{adj}} = \frac{3\sqrt{11}}{-1}$$

$$= -3\sqrt{11}$$

II

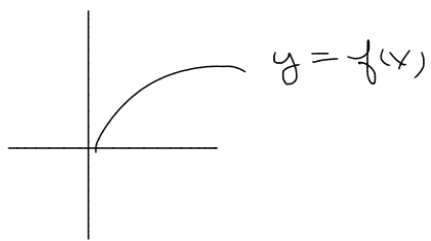


must be
negative
b/c

$$\cos \theta < 0$$

$$\text{and } \Rightarrow \theta \in \text{QII}$$

$$\theta \in \left(\frac{\pi}{2}, \pi\right)$$



$y = -f(x)$ reflection about x -axis

$$\left(\frac{1}{7}\right)^x = -(7)^x$$

reflect about y -axis =
 $f(x) \longrightarrow f(-x)$

$$\left(\frac{1}{7}\right)^x = 7^{\overbrace{(-x)}^{-1 \cdot x}} = 7^{-1 \cdot x} = (7^{-1})^x = \left(\frac{1}{7}\right)^x$$