

Problem 1 IN NOTES

a. What is the inverse of the relation described by $y = 5x^2 + 2$?

$$\begin{array}{r} x = 5y^2 + 2 \\ -2 \quad -2 \end{array}$$

$$\frac{x-2}{5} = \frac{5y^2}{5}$$

$$\sqrt{y^2} = \pm \sqrt{\frac{x-2}{5}}$$

$$\sqrt{y^2} = \pm \sqrt{9}$$

$$y = \pm 3$$

$$y = \pm \sqrt{\frac{x-2}{5}}$$

$$\rightarrow \pm \sqrt{\frac{3-2}{5}} = \pm \sqrt{\frac{1}{5}} \quad \begin{matrix} (3, \sqrt{\frac{1}{5}}) \\ (3, -\sqrt{\frac{1}{5}}) \end{matrix}$$

function? \rightarrow No.

b. $y = 2 - 5x$ function? yes

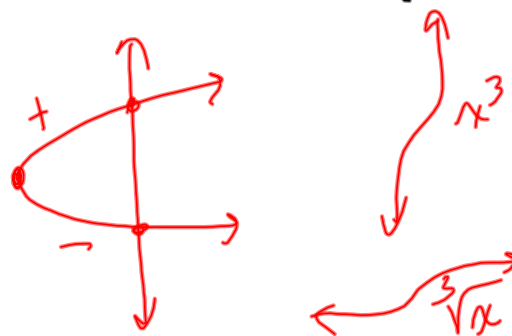
$$\begin{array}{r} x = 2 - 5y \\ -2 \quad -2 \end{array}$$

$$\frac{x-2}{-5} = \frac{-5y}{-5}$$

$$y = \frac{x-2}{-5} \quad \text{or} \quad y = -\frac{1}{5}x + \frac{2}{5}$$

line

function? yes



Problem 2

Consider the function

$$g(x) = -\frac{2}{3}x + 7 \quad \text{line}$$

a. domain? ARN range? ARN

b. What is g^{-1} ?

$$y = -\frac{2}{3}x + 7$$

$$x = -\frac{2}{3}y + 7$$

$$-\frac{3}{2}(x-7) = \left(-\frac{2}{3}y\right)\left(-\frac{3}{2}\right)$$

$$-\frac{3}{2}x + \frac{21}{2} = y$$

"g-inverse of x"

$$g^{-1}(x) = -\frac{3}{2}x + \frac{21}{2}$$

line

c. domain? ARN range? ARN

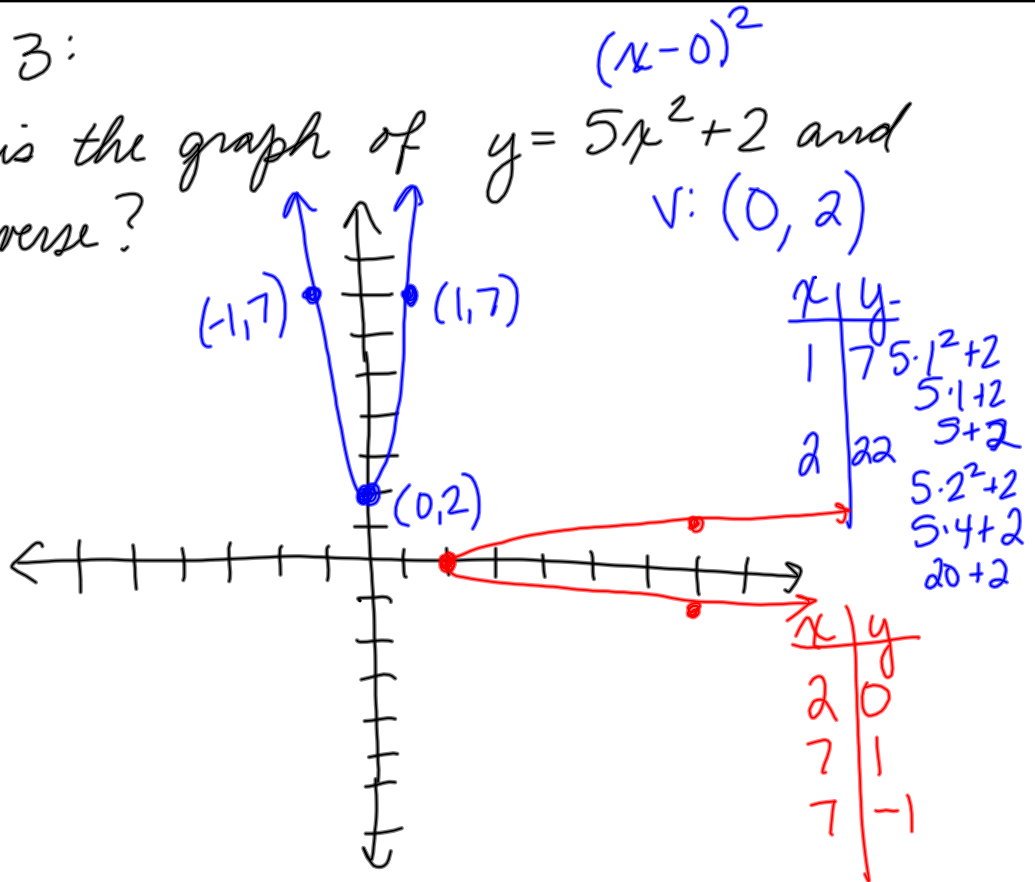
d. Is g^{-1} a function? Explain.

Yes, each input has exactly one output

(for each x in the domain, there is only one value of y in the range)

Problem 3:

a. What is the graph of $y = 5x^2 + 2$ and its inverse?



b. $y = (x-1)^2$

