

7) Given $f(x) = x^2 + 3$

$$g(x) = 4x - 1$$

find a) $(f \circ g)(x)$

b) $(g \circ f)(x)$

c) $(f \circ g)(3)$

7a) $(f \circ g)(x) = f(g(x))$

$$= (4x - 1)^2 + 3$$

$$= \overbrace{(4x - 1)(4x - 1)} + 3$$

$$= 16x^2 - 4x - 4x + 1 + 3$$

$$= 16x^2 - 8x + 4$$

b) $(g \circ f)(x) = g(f(x))$

$$= 4(x^2 + 3) - 1$$

$$= 4x^2 + 12 - 1$$

$$= 4x^2 + 11$$

c) $(f \circ g)(3) = 16 \cdot 3^2 - 8 \cdot 3 + 4$

$$= 16 \cdot 9 - 24 + 4$$

$$= 144 - 24 + 4$$

$$= 124$$

8) Prove $f(x) = 2 - 5x$ and $g(x) = \frac{2-x}{5}$ are inverses

by showing $f(g(x)) = x$

and $g(f(x)) = x$

$$f(g(x)) = 2 - 5\left(\frac{2-x}{5}\right)$$

$$= 2 - (2 - x)$$

$$= 2 - 2 + x$$

$$= x$$

$$g(f(x)) = \frac{2 - (2 - 5x)}{5}$$

$$= \frac{\cancel{2} - \cancel{2} + 5x}{5}$$

$$= \frac{5x}{5}$$

$$= x$$

9) Find $f^{-1}(x)$ if

A) $f(x) = 3x - 5$

B) $f(x) = \frac{4-x}{7}$

A) $y = 3x - 5$

$$\begin{array}{r} x = 3y - 5 \\ +5 \quad +5 \\ \hline \end{array}$$

$$\frac{x+5}{3} = \frac{3y}{3}$$

$$y = \frac{x+5}{3}$$

$$f^{-1}(x) = \frac{x+5}{3}$$

B) $y = \frac{4-x}{7}$

$$7 \cdot x = \frac{4-y}{7} \cdot 7$$

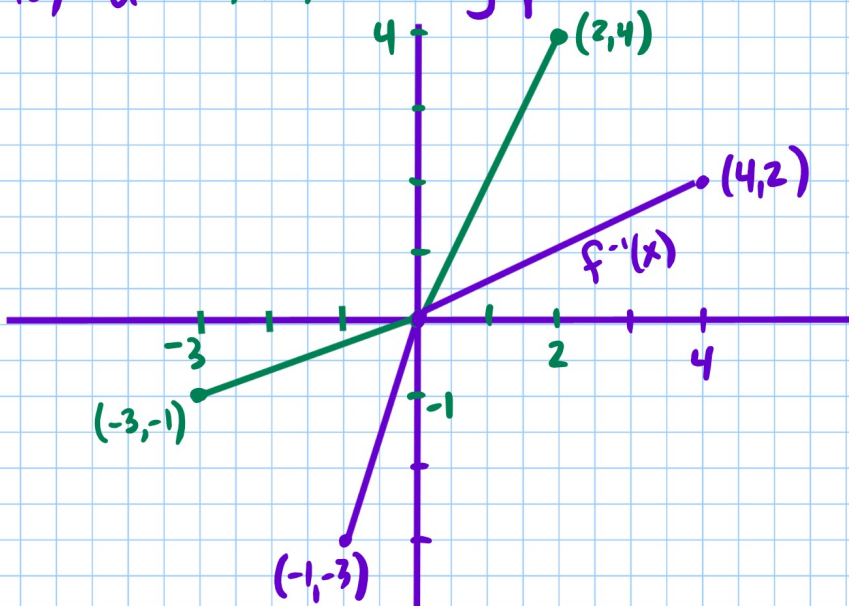
$$-1(7x = 4 - y)$$

$$\begin{array}{r} -7x = -4 + y \\ +4 \quad +4 \\ \hline \end{array}$$

$$-7x + 4 = y$$

$$f^{-1}(x) = -7x + 4$$

10) Use $f(x)$ to graph $f^{-1}(x)$



PPP

1) Determine if each is a function. If it is, list domain and range.

A) $\{(4,7), (5,8), (6,10), (4,11)\}$

B) $\{(A,7), (B,8), (C,9), (D,10)\}$

2) For $f(x) = 7x^2 - x + 11$, find:

A) $f(0)$

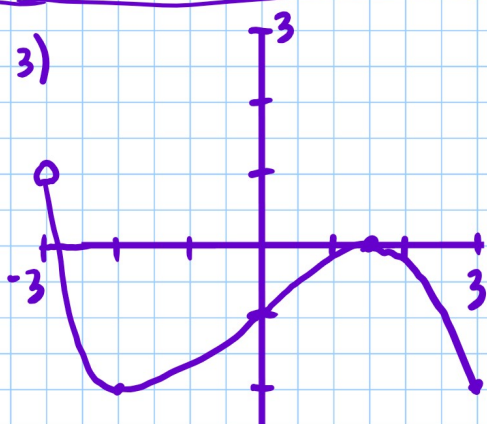
B) $f(-5)$

C) $f(8)$

D) $f(E)$

E) $f(2a)$

3)



a) $f(0) =$

b) $f(-2) =$

c) For what value(s) of x is $f(x) = -2$?

d) Domain and Range in interval notation.

4) Find domain of

A) $f(x) = 7 - 3x$

B) $g(x) = \frac{4x-1}{x+10}$

5) Given $f(x) = 4x^2 + 7x - 1$ and $g(x) = 5 - 7x$ find

a) $(f+g)(x)$

b) $(f+g)(-2)$

6) Given $f(x) = 8 + 3x$ and $g(x) = 8x - x^2$ find:

a) $(f+g)(3)$

b) $(g-f)(x)$

c) $f(-2) - g(-2)$

d) $(fg)(x)$

e) $\left(\frac{f}{g}\right)(-5)$

f) $\left(\frac{g}{f}\right)(6)$

7) Given $f(x) = 4x - 1$ and $g(x) = 8 + x^2$ find:

A) $(f \circ g)(x)$

B) $(g \circ f)(x)$

C) $(g \circ f)(-1)$

8) Prove $f(x) = 8x + 7$ and $g(x) = \frac{x-7}{8}$ are inverses by showing $f(g(x)) = x$ and $g(f(x)) = x$

9) Find $f^{-1}(x)$ if A) $f(x) = 8 + 5x$ B) $f(x) = \frac{10+x}{3}$

10) Graph $f^{-1}(x)$ given $f(x)$:

