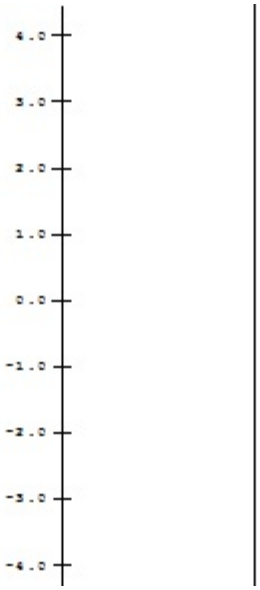
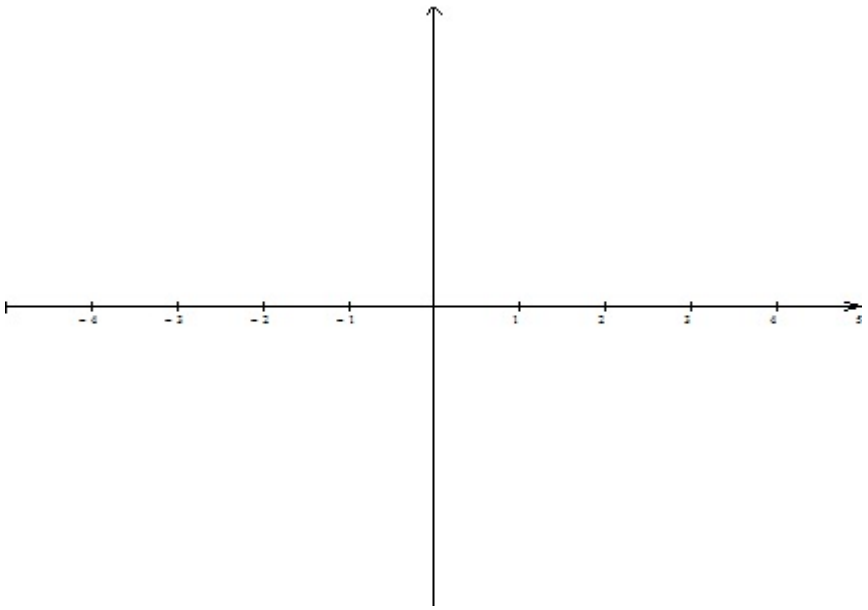
1. Suppose that $f(x) = 5x - 7$ for all $x \in \mathbb{R}$.
   a. Complete the following table :

x	-3	-2	-1	0	1	2	3
$f(x)$							

   b. Complete the following mapping diagram for f with the indicated numbers (determine an appropriate scale for the target values.):

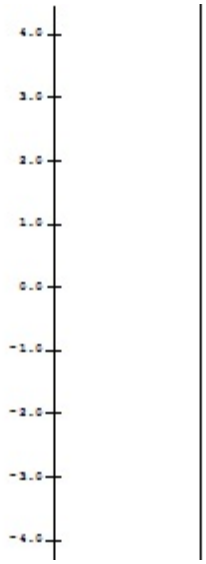


   c. Sketch a graph for f based on the chart (determine an appropriate scale for the vertical axis.):

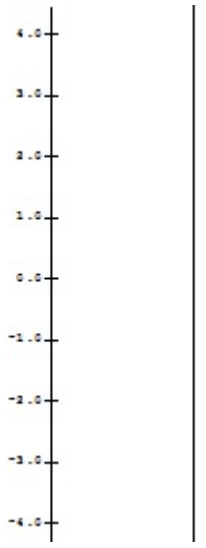


2. Let $\boldsymbol{f(x) = m\,x + b}$ sketch mapping diagrams for the following:
Use the same scale for the second axis.

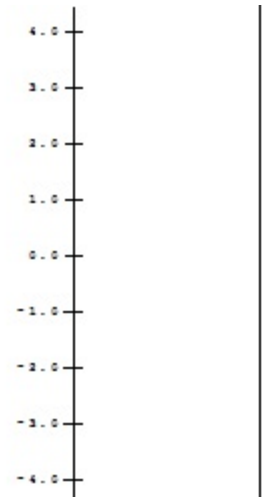
a. m = -2; b = 1: $f(x) = -2x + 1$



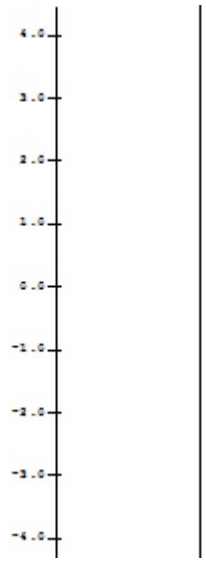
b. m = 2; b = 1: $f(x) = 2x + 1$



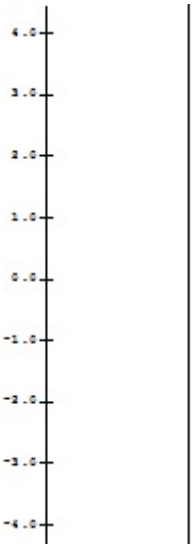
c. m = ½; b = 1: $f(x) = ½\,x + 1$



d. m = 0; b = 1: $f(x) = 0\,x + 1$



e. m = 1; b = 1: $f(x) = x + 1$

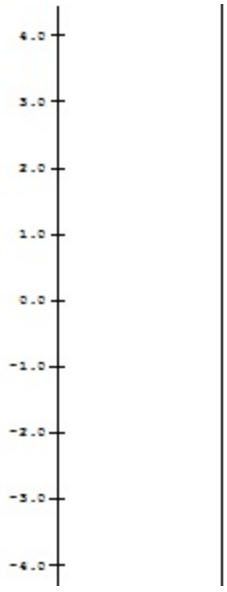


3. Using the focus point to solve a problem. [Use the same scale for the second axis.]

E 1.Solving a linear equation: $2x+1=5$

Let $f(x) = 2x+1$

For which x does $f(x) = 5$?



Solution: Find the focus points [2,1] for f.

Use [2,1] to find the solutions.

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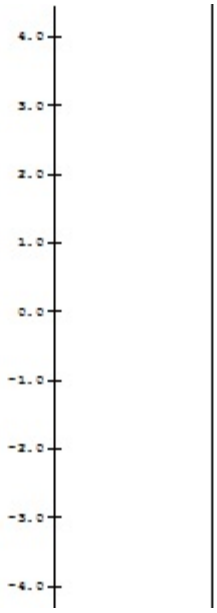
4. Suppose f is a linear function with $f(1) = 3$ and $f(3) = -1$.

Find $f(0)$. Ans. _____

For which x does $f(x) = 0$. Ans.: _____

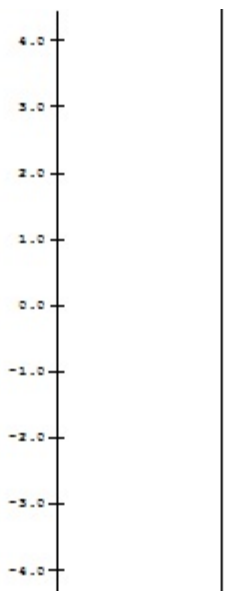
Solution: Find the focus point P_f for f.

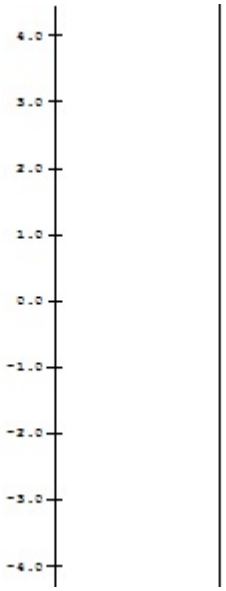
Use P_f to find the solution.



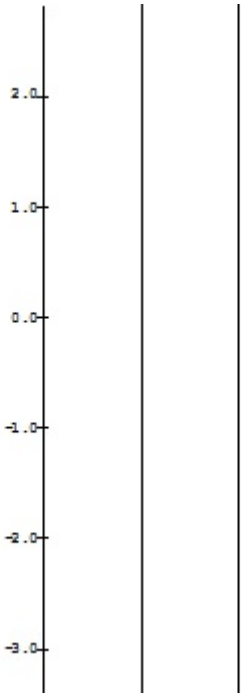
5.

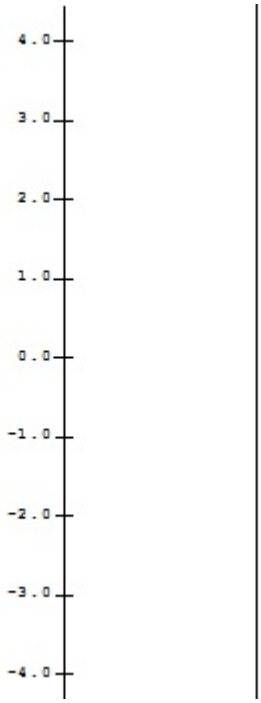
a. On separate diagrams sketch mapping diagrams for g(x) = 2x and h(x)= x+1





b. Use these sketches to draw a composite sketch of the mapping diagram for the composite function f(x) = h(g(x)) =(2x) + 1 and then a sketch for the mapping diagram of f(x) = 2 x + 1





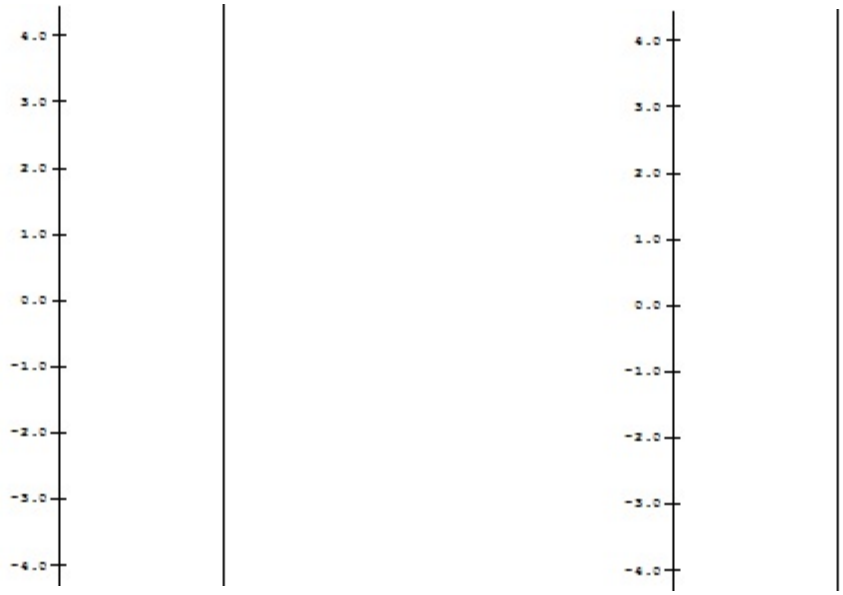
c. Use the sketches of part a. to draw a composite sketch of the mapping diagram for the composite function p(x) = g(h(x)) =2(x + 1) and then a sketch for the mapping diagram of p(x) = 2(x + 1) = 2x +2

Inverse linear functions:

6.

a. Make a transparency for mapping diagrams for g(x) = 2x and h(x)= x + 1. Flip the transparency over and use this on separate diagrams to sketch mapping diagrams for

Invg(x) = 1/2 x and Invh(x)= x-1



"Socks and shoes" with mapping Diagrams

b. Recall f(x) = h(g(x)) =(2 x) + 1 Use the sketches of part a to draw a composite sketch of the mapping diagram for the composite function invf(x) = invg(invh(x)) =1/2(x - 1) and then a sketch for the mapping diagram of invf(x) = 1/2(x - 1) = 1/2 x -1/2

Think about These Problems:

7. How would you use the Linear Focus to **find the mapping diagram for the function inverse for a linear function when m≠0?**

8. How does the **choice of axis scales** affect the **position of the linear function focus point** and its use in solving equations?