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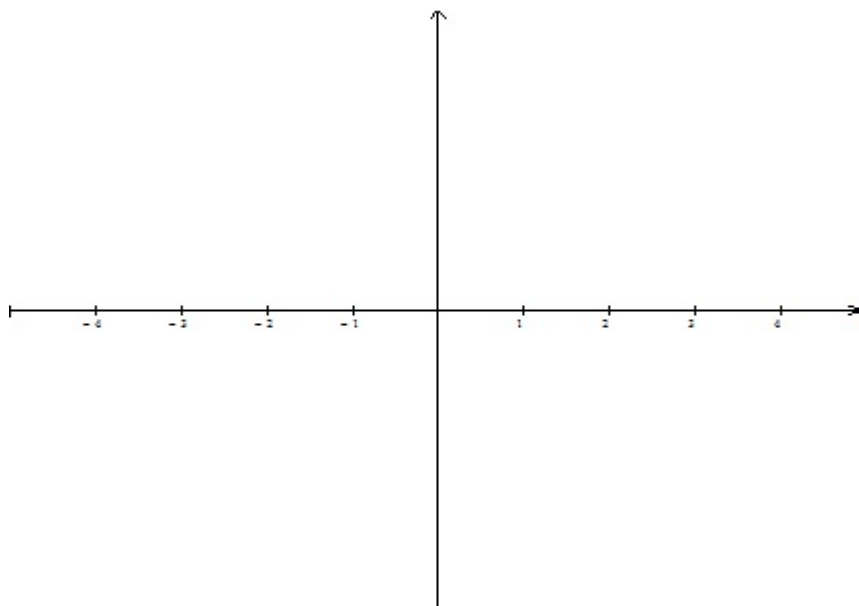   a. Complete the following table :

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.):
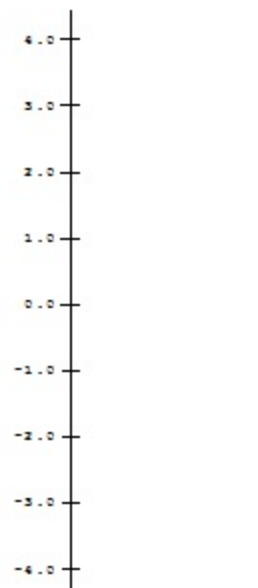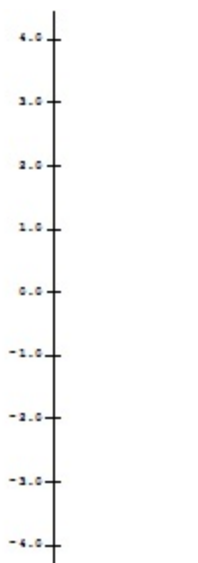
   c. Sketch a graph for f based on the chart (determine an appropriate scale for the vertical axis.):
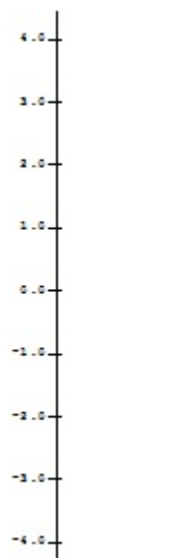
2. Let $f(x) = mx + b$ sketch mapping diagrams for the following:
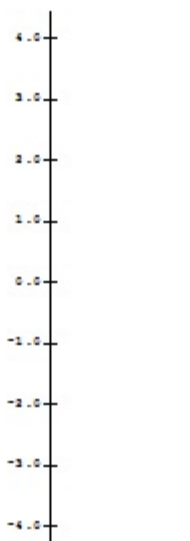Use the same scale for the second axis.

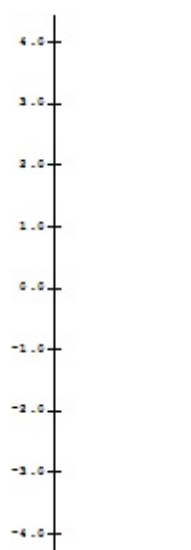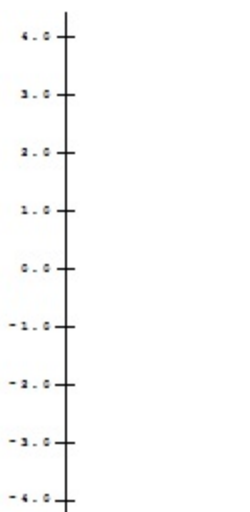   *a.* m = -2; b = 1: $f(x) = -2x + 1$ m = 2;   d. m = 0; b = 1: $f(x) = 0\ x + 1$

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

c. m = ½; b = 1: $f(x) = ½\ x + 1$

3.   Using the focus point to solve a problem. [Use the same scale for the second axis.]
E 1.Solving a linear equation: $2x+1 = 5$; $2x+1 = x + 2$
Let $f(x) = 2x+1$ and $g(x) = x+2$
For which x does $f(x) = 5$; $f(x) = g(x)$?
Solution: Find the focus points [2,1] for f and [1,2] for g.
Use [2,1] and [1,2] to find the solutions.
What visual feature of [2,1] and [1,2] identified x where $f(x) = g(x)$?

```
4.0
3.0
2.0
1.0
0.0
-1.0
-2.0
-3.0
-4.0
```
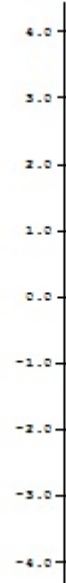
4.   Find "fixed points" of $f : f(x) = 2x+1$
For which x does $f(x) = x$?
Solution: Find the focus point [2,1] for f. Use [2,1] to find the solution.
What visual feature of [2,1] identified x where $f(x) = x$?

```
4.0
3.0
2.0
1.0
0.0
-1.0
-2.0
-3.0
-4.0
```
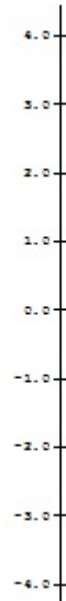
5.

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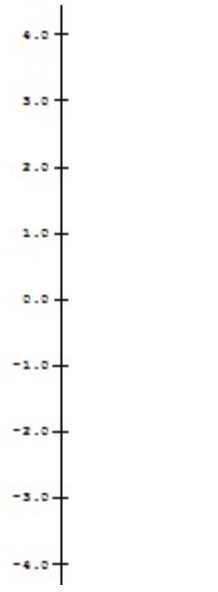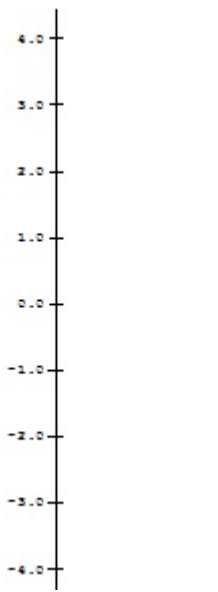
   b. Use these sketches to draw a composite sketch of the mapping diagram for the composite
      function $f(x) = h(g(x)) = (2x) + 1$ and then a sketch for the mapping diagram of $f(x) = 2x + 1$
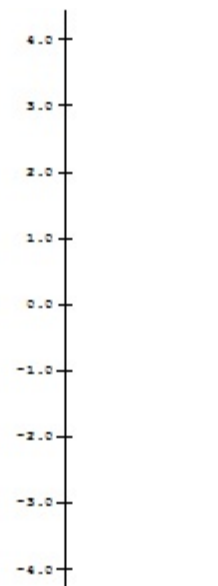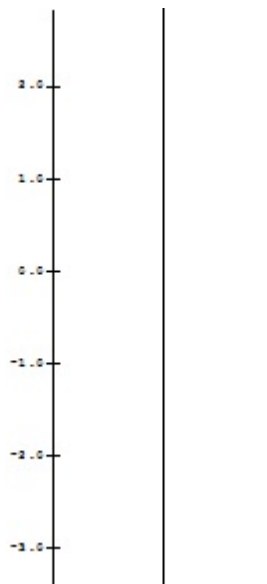
c. Use the sketches of part a. to draw a composite sketch of the mapping diagram for the
    composite function p(x) = g(h(x)) =2(x + 1) and then a sketch for the mapping diagram of
    p(x) = 2(x + 1) = 2x +2

Inverse linear functions:
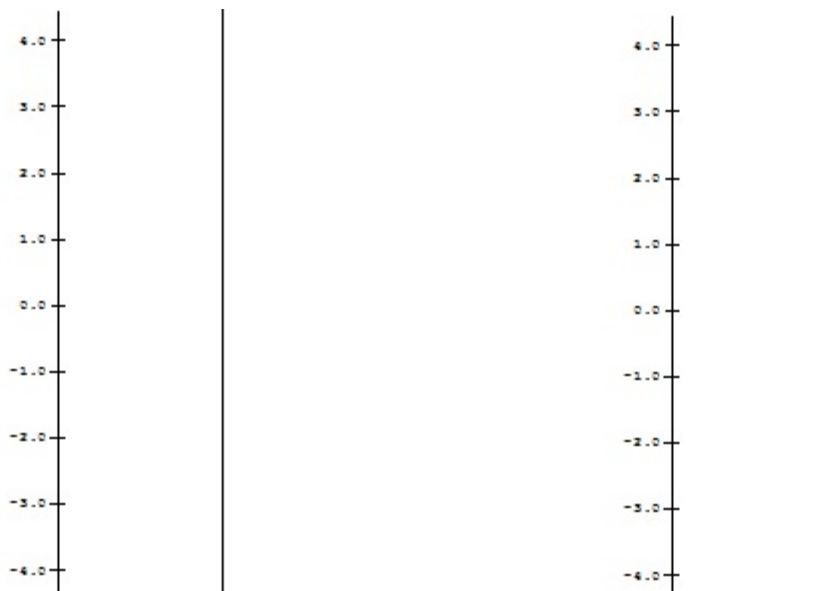
6.

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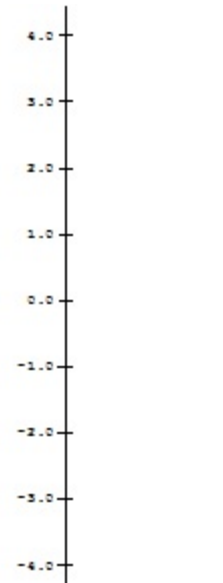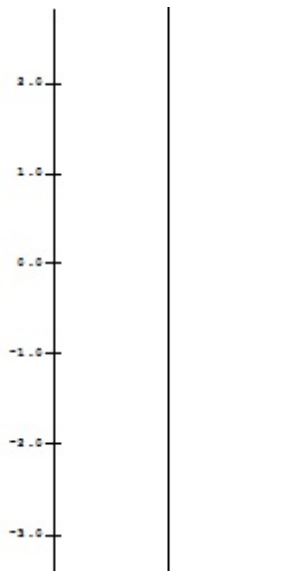   invg(x) = 1/2 x   and   Invh(x)= x-1

"Socks and shoes" with mapping Diagrams
    b. Use the sketches of part a to draw a composite sketch of the mapping diagram for the composite function invf(x) = invh(invg(x)) =1/2(x - 1) and then a sketch for the mapping diagram of invf(x) = 1/2(x - 1) = 1/2x -1/2

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?