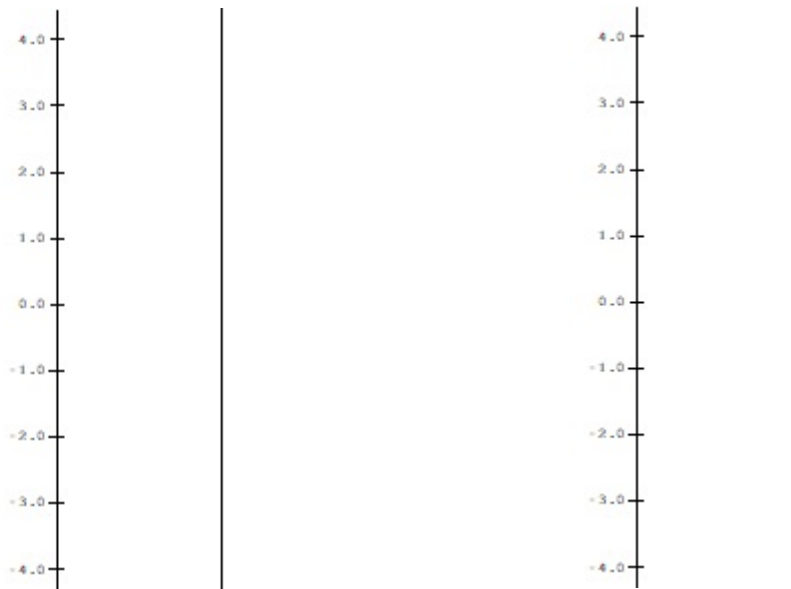


I.

- a. Complete the following tables for  $m(x) = 2x$  and  $s(x) = x + 1$

$x$	$m(x) = 2x$	$s(x) = x + 1$
2		
1		
0		
-1		
-2		

- b. Using the data from part a), on separate diagrams sketch mapping diagrams for  $m(x) = 2x$  and  $s(x) = x+1$



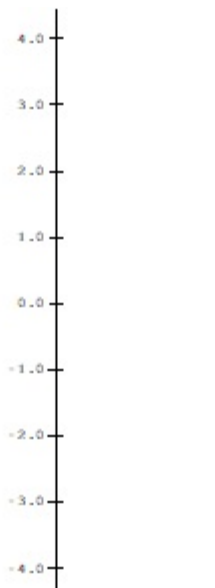
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2. Let  $q(x) = x^2$ .

a. Complete the following table for  $q(x) = x^2$ .

$x$	$q(x) = x^2$
2	
1	
0	
-1	
-2	

b. Using the data from part a), sketch a mapping diagram for  $q(x) = x^2$ .



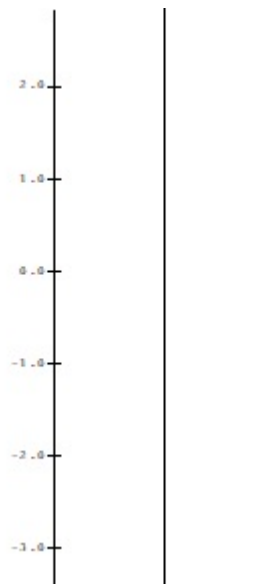
3.

a. Complete the following table for the composite function  $f(x) = s(m(x)) = 2x + 1$ .

$x$	$m(x) = 2x$	$s(m(x)) = 2x + 1$
2		
1		
0		
-1		
-2		

b. Use the table and the previous sketches of 1.b to draw a composite sketch of the mapping diagram with 3 axes for the composite function  $f(x) = s(m(x)) = 2x + 1$ .

c. Draw a sketch for the mapping diagram with 2 axes of  $f(x) = 2x + 1$ .

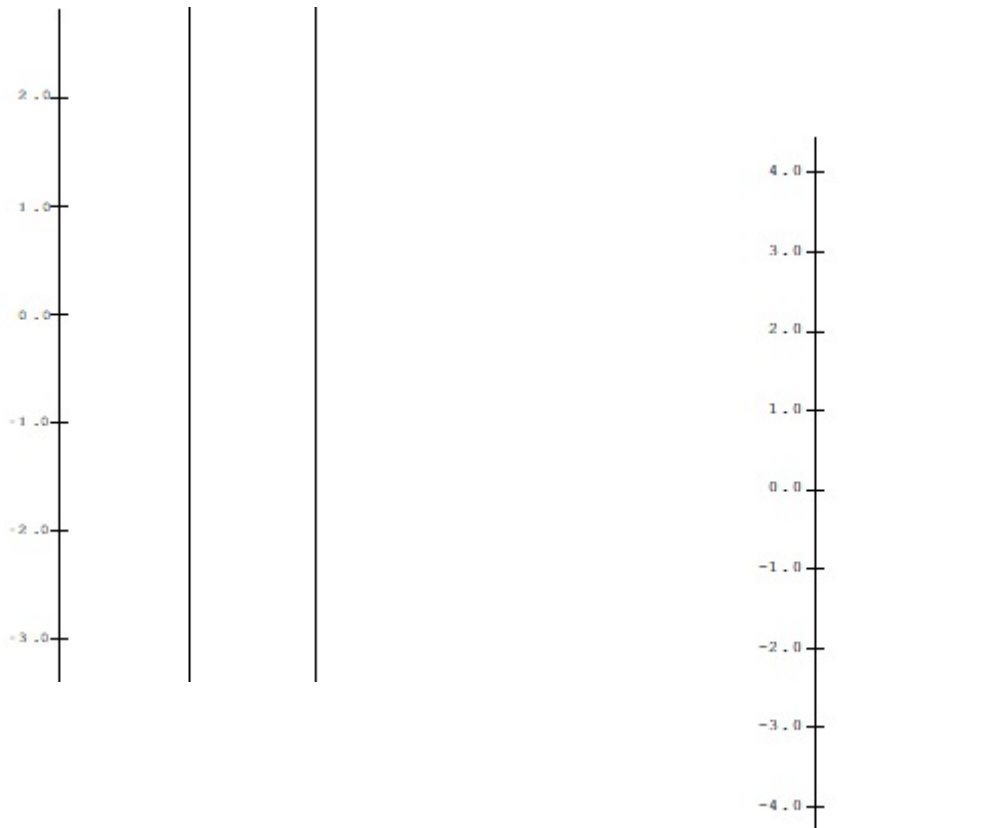


4. Let  $q(x) = x^2$  and  $R(x) = s(q(x)) = x^2 + 1$ .

a. Complete the following tables for  $q(x) = x^2$  and  $R(x) = s(q(x)) = x^2 + 1$

$x$	$q(x) = x^2$	$R(x) = s(q(x)) = x^2 + 1$
2		
1		
0		
-1		
-2		

b. Using the data from part a), on separate diagrams sketch mapping diagrams for the composition  $R(x) = s(q(x)) = x^2 + 1$  with three axes and then two axes.



5. Solving Equations:

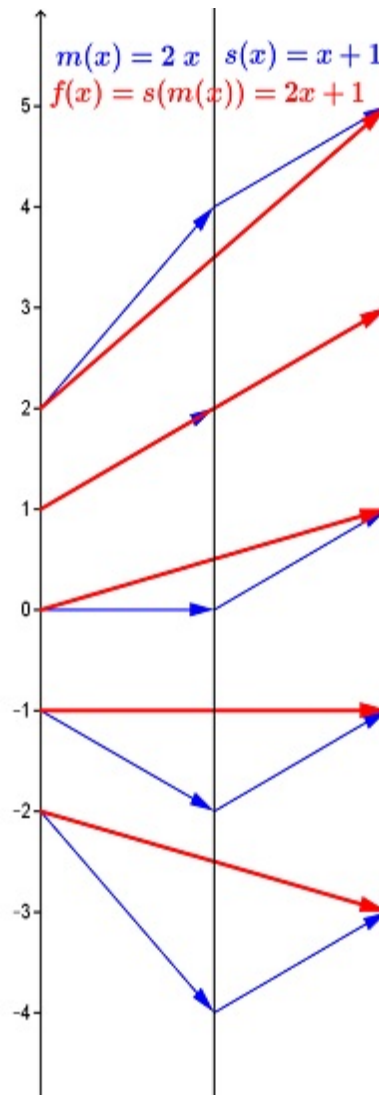
- a. Use a standard algebraic approach to solve the following equation. Show all steps. Check your answer.

$$2x + 1 = 5.$$

Work:

Check:

- b. On the mapping diagram below indicate by adding and circling numbers and arrows how the diagram visualizes the work in your algebraic solution of  $2x + 1 = 5$ .



6. Solving  $2(x-3)^2 + 1 = 9$  with a mapping diagram.

- a. Express
- $f(x) = 2(x-3)^2 + 1$
- as composition of core linear and quadratic functions.

$$f(x) = h(m(q(z(x)))) \text{ where}$$

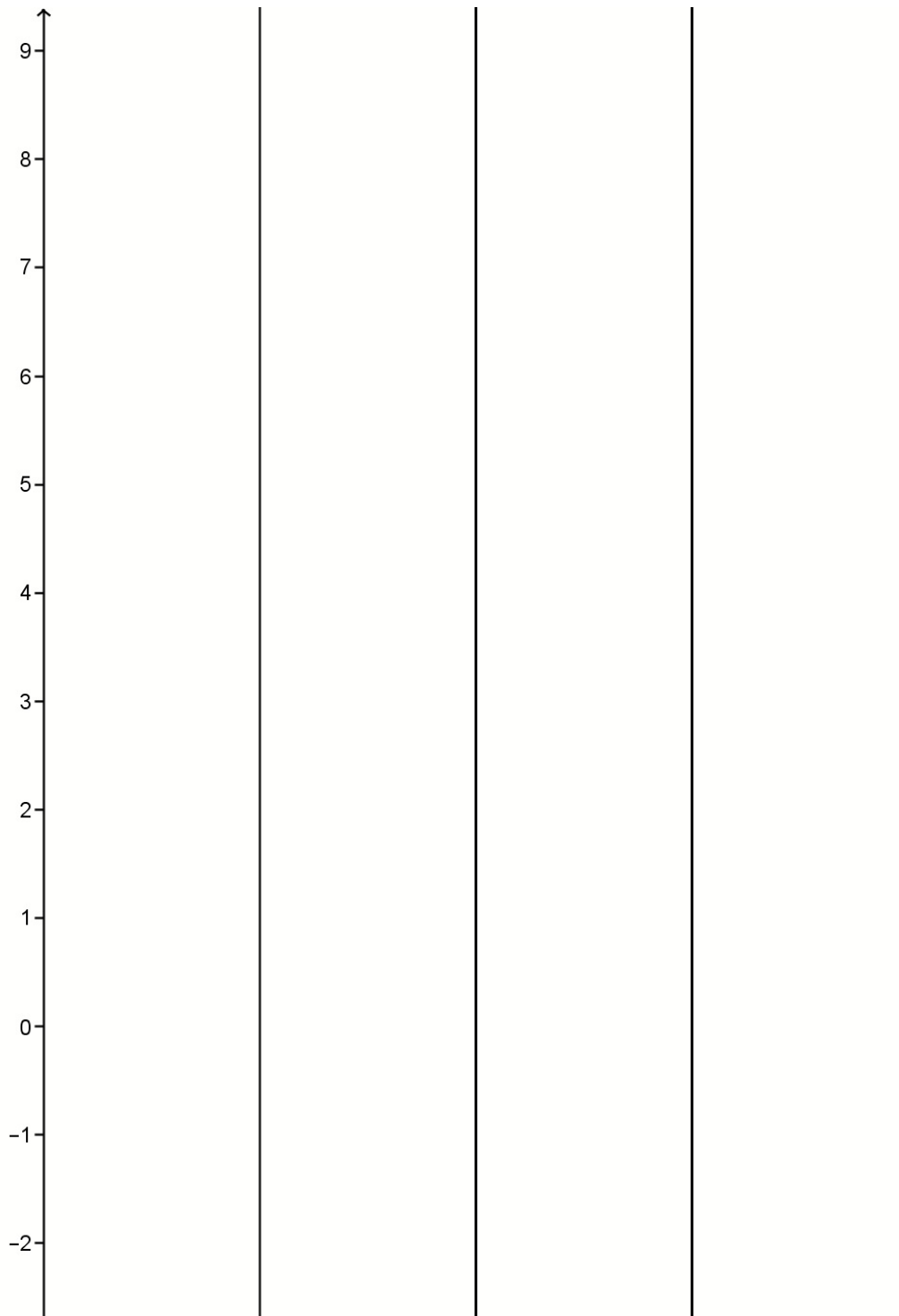
$$h(x) = \underline{\hspace{2cm}}$$

$$m(x) = \underline{\hspace{2cm}}$$

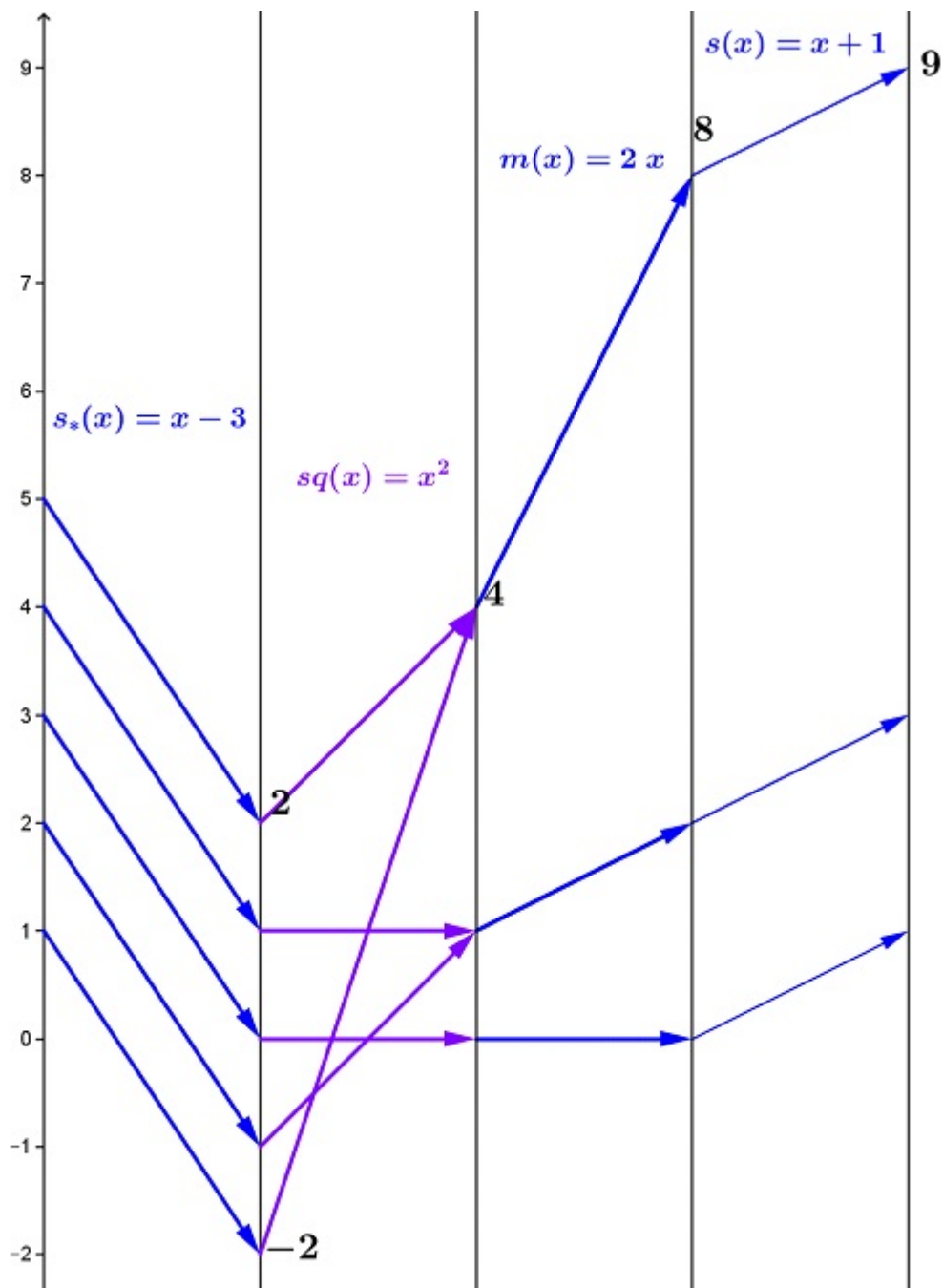
$$q(x) = \underline{\hspace{2cm}}$$

$$z(x) = \underline{\hspace{2cm}}$$

- b. Sketch a mapping diagram for
- $f$
- as a composition.



c. On the mapping diagram below indicate by circling numbers and arrows how the diagram visualizes the solution of  $2(x-3)^2 + 1 = 9$ . Check the solutions.



Check:

7. Let  $f(z) = z^2 + 1$ .

a. Complete the following table for  $f$ :

$f(a+bi)$	-1	0	1
i	$f(-1 + i) =$	$f(i) =$	$f(1 + i) = 1 + 2i$
0	$f(-1) = 2$	$f(0) = 1$	$f(1) = 2$
-i	$f(-1 - i) =$	$f(-i) =$	$f(1 - i) =$

b. Sketch a mapping diagram for the table data below on the pair of complex planes.

