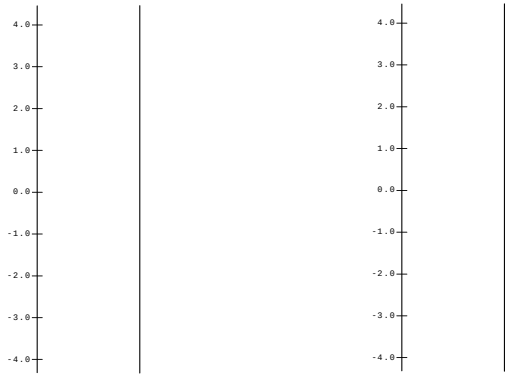
1.

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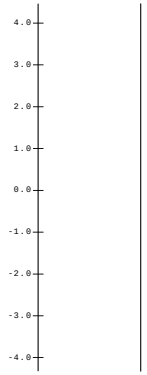
2. Let $q(x) = x^2$.

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 $q(x) = x^2$.



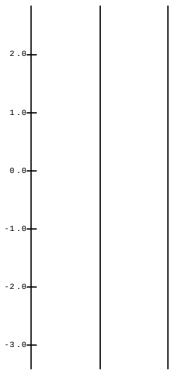
3.

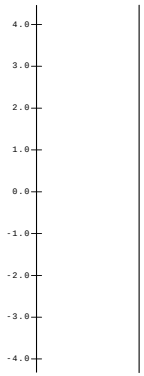
a. Complete the following table for the composite function $f(x) = s(m(x)) = 2x + 1$.

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





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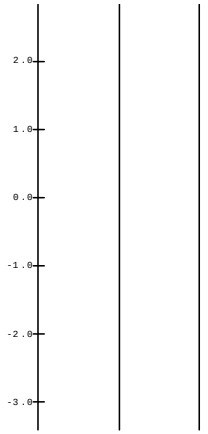
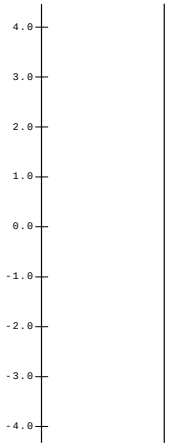
4. Let $q(x) = x^2$ and $R(x) = s(q(x)) = x^2 + 1$.

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.





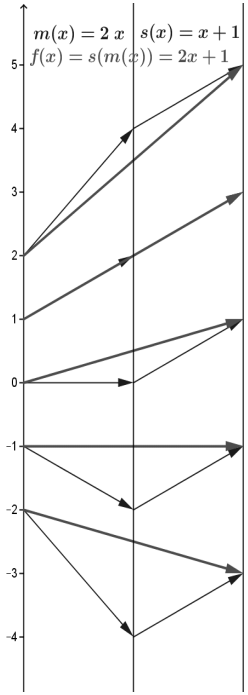
5. Solving Equations:
   a. Use a standard algebraic approach to solve the following equation. Show all steps. Check your answer.

$$2x + 1 = 5.$$

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 $2x + 1 = 5$.



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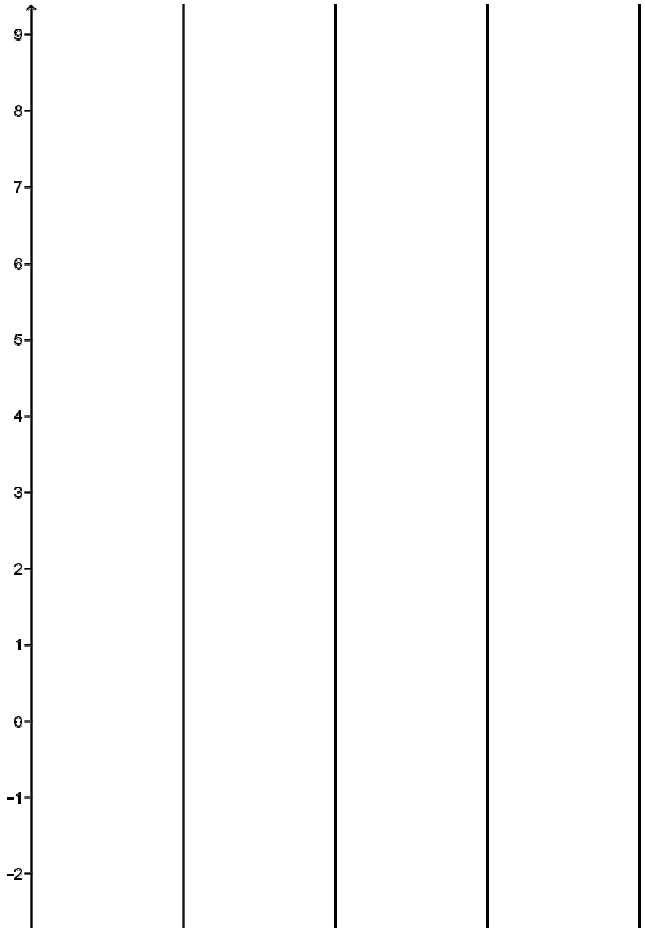
6. Solving $\mathbf{2(x\text{-}3)^2 + 1 = 9}$ with a mapping diagram.
   a. Express $\boldsymbol{f(x) = 2(x\text{-}3)^2 + 1}$ as composition of core linear and quadratic functions.

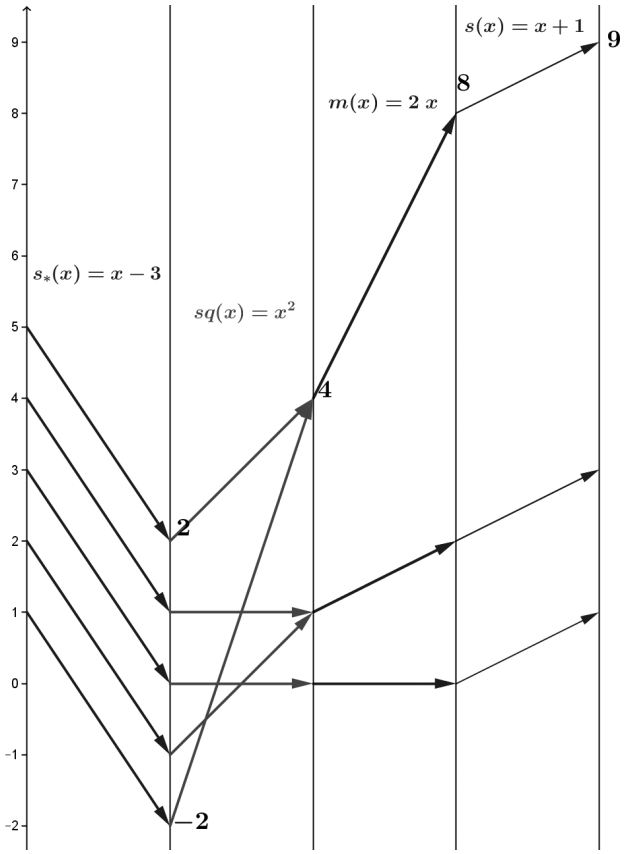
$$f\,(x) = h\,(\,m\,(\,q\,(\,z\,(\,x\,))))\quad \text{where}$$

$h\,(\,x) =$ _____
$m\,(\,x) =$ _____
$q\,(\,x) =$ _____
$z\,(\,x) =$ _____

   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:

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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.