Addition Functions

① Find the following four vectors:

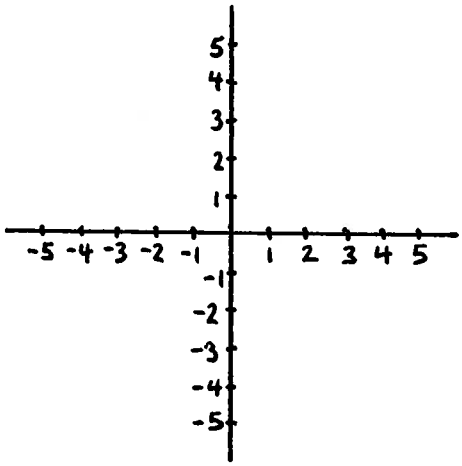
$A_{(3,1)}(2,2)$

$A_{(3,1)}(2,-2)$

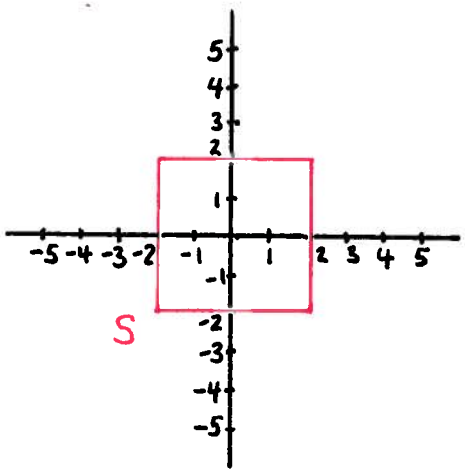
$A_{(3,1)}(-2,2)$

$A_{(3,1)}(-2,-2)$

② Draw the four vectors above as points in the plane.



③ Let $S \subseteq \mathbb{R}^2$ be the set of points that make up the square below. For example, $(2,2)$, $(2,-2)$, $(-2,2)$, and $(-2,-2)$ are all points in S.



④ $A_{(3,1)}(S)$ is the set of all points of the form $A_{(3,1)}(a,b)$ where $(a,b) \in S$. List at least four points in $A_{(3,1)}(S)$.

⑤ In the planes above, first on the left and then on the right, draw the set $A_{(3,1)}(S)$.

⑥ $A_{(3,1)}(S)$ is called the image of S under $A_{(3,1)}$.

Scaling

① Find the following four vectors:

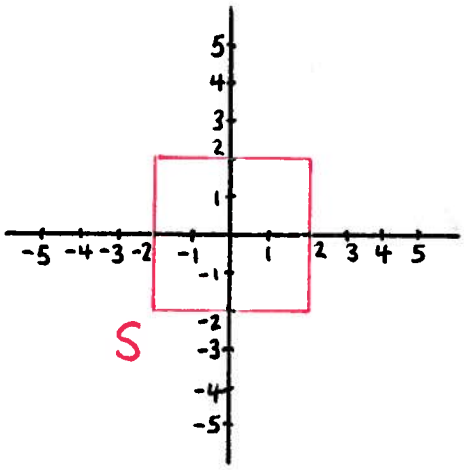
$\frac{5}{2}(2,2)$

$\frac{5}{2}(2,-2)$

$\frac{5}{2}(-2,2)$

$\frac{5}{2}(-2,-2)$

② Let $S \subseteq \mathbb{R}^2$ be the square below



③ On the plane to the left, draw the result of scaling every point in S by $\frac{5}{2}$.