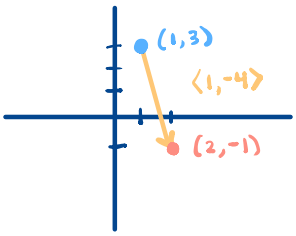
1. Calculate $\langle 1, -4\rangle + (1, 3)$.

$\langle 1,-4\rangle + (1,3) = (1+1, -4+3)$
$= (2, -1).$

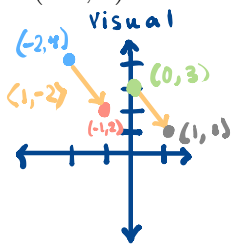
Visual



2. The vector V moves the point $(-2, 4)$ to $(-1, 2)$. Calculate $V + (0, 3)$.

$V = (-1, 2) - (-2, 4)$
$= (-1 - (-2),\ 2 - 4)$
$= \langle 1, -2\rangle$
so, $V + (0,3) = \langle 1,-2\rangle + (0, 3)$
$= (1, 1).$

Visual



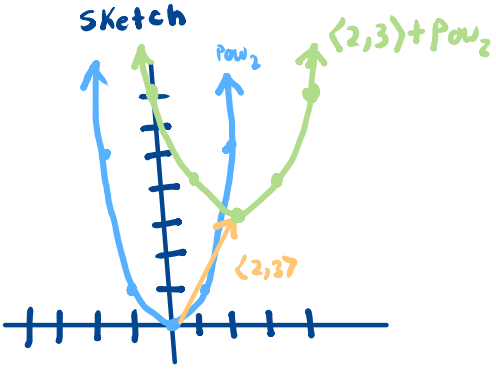
3. Sketch $\langle 2, 3\rangle + \text{pow}_2$ and find an equation that describes the points in this new function.

$g = \langle 2,3\rangle + \text{Pow}_2$
$= \langle 2,3\rangle + \{(x, x^2) : x \in \mathbb{R}\}$
$= \{(x+2,\ x^2+3) : x \in \mathbb{R}\}$ Set $X = x+2$
$= \{(X, (X-2)^2+3) : x-2 \in \mathbb{R}\}$ So $X - 2 = x$

So equation is

$g(x) = (x-2)^2 + 3.$

Sketch

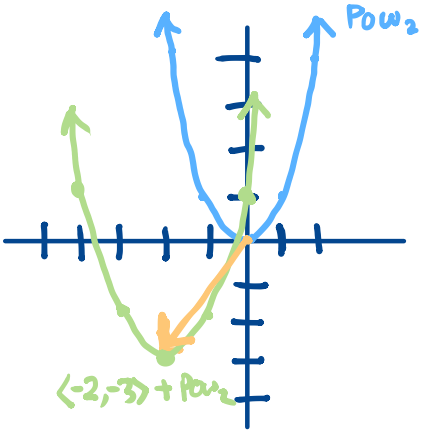


4. Sketch $\langle -2, -3\rangle + \text{pow}_2$ and find an equation that describes the points in this new function.

$g = \langle -2,-3\rangle + \text{Pow}_2$
$= \langle -2,-3\rangle + \{(x, x^2) : x \in \mathbb{R}\}$
$= \{(x-2,\ x^2-3) : x \in \mathbb{R}\}$
$= \{(X, (X+2)^2-3) : x+2 \in \mathbb{R}\}$ Set $X = x-2$ So $X + 2 = x$

So equation

$g(x) = (x+2)^2 - 3.$



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