Introduction to Vectors

Vectors and Linear Combinations

v, w, c d

$$cv + dw = c\begin{bmatrix}1\\1\end{bmatrix} + d\begin{bmatrix}2\\3\end{bmatrix} = \begin{bmatrix}c+2d\\c+3d\end{bmatrix}$$

R

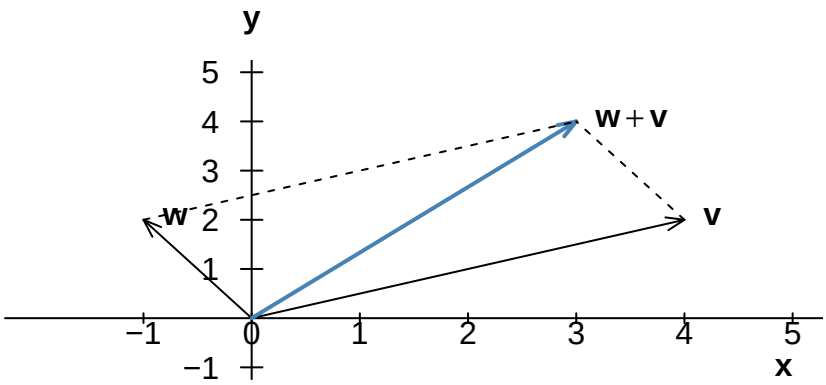
```
# c()
v <- c(1, 1)
w <- c(2, 3)
print(v + w)
```

```
[1] 3 4
```

```
c <- 2 #   c     c  c R
d <- 1
print(c * v + d * w)
```

```
[1] 4 5
```

$$w + v = \begin{bmatrix}-1\\2\end{bmatrix} + \begin{bmatrix}4\\2\end{bmatrix} = \begin{bmatrix}3\\4\end{bmatrix}$$



Lengths and Dot Products

Matrices