

## Quiz 2 MATH 3520

Let  $A \in \mathbb{R}^{3 \times 3}$ . What size does  $B$  have to be so that  
 $AB \in \mathbb{R}^{3 \times 7}$ ?

What size does  $C$  have to be so that  $CA \in \mathbb{R}^{11 \times 3}$ ?

Soln: In order for  $AB$  to exist,  $B \in \mathbb{R}^{3 \times l}$  for some  $l$ .  
In that case  $AB \in \mathbb{R}^{3 \times l}$  as well, so we must take  $l=7$ .

Similarly,  $C \in \mathbb{R}^{m \times 3}$  for some  $m$ . In that case,

$CA \in \mathbb{R}^{m \times 3}$  as well, so  $m=11$  is required.

In summary:

$$B \in \mathbb{R}^{3 \times 7}$$

and

$$C \in \mathbb{R}^{11 \times 3}$$