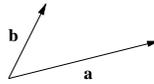


WEDNESDAY 24TH SEPTEMBER : VECTORS

Reading: section 9.2 and 9.3
Homework: 9.2 Q6, 18, 20, 24, 34

1. OPERATIONS ON VECTORS : GEOMETRY

- The vectors \mathbf{a} and \mathbf{b} are shown below



Draw

$\mathbf{a} + \mathbf{b}$

$2\mathbf{b}$

$-\mathbf{b}$

$\mathbf{a} - \mathbf{b}$

- Draw a picture to show that $3\mathbf{a} = \mathbf{a} + \mathbf{a} + \mathbf{a}$

2. OPERATIONS ON VECTORS : ALGEBRA

- Let

$$\mathbf{a} = \langle 3, 2 \rangle \quad \mathbf{b} = \langle 1, -1 \rangle$$

- Draw \mathbf{a} and \mathbf{b}
- Compute $\mathbf{a} + \mathbf{b}$, $\mathbf{a} - \mathbf{b}$, $5\mathbf{b}$

- Write the following vectors in components. They each have length 10.



3. APPLICATIONS

- A train is moving north-west at $30ms^{-1}$. Inside one of the carriages, a passenger rolls a marble south at $2ms^{-1}$. You are standing outside the train. How fast do you see the marble move? In what direction?

- The picture has mass 10kg. Find the magnitude of the tension in each rope.

