

Vector Subtraction

1.) Subtract the following vectors:

a.) $12 \text{ N at } 40^\circ \text{ S of E} - 6 \text{ N at } 20^\circ \text{ W of S}$

b.) $1.8 \frac{\text{m}}{\text{s}} \text{ at } 45^\circ \text{ W of N} - 1.0 \frac{\text{m}}{\text{s}} \text{ at } 70^\circ \text{ W of N}$

c.) $17 \text{ m due east} - 5 \text{ m due west.}$

2.) A cat walks 17 m due north. It is later seen 22 m due east of its starting point. What was its change in displacement?

3.) A bird can fly at $6.0 \frac{\text{m}}{\text{s}}$ and is pointed due west. From the ground it appears to be travelling at $10.0 \frac{\text{m}}{\text{s}}$ at 53° S of W , what is the wind's velocity?

Answers -

1a.) $11.4 \text{ N at } 10.5^\circ \text{ S of E}$

1b.) $0.99 \frac{\text{m}}{\text{s}} \text{ at } 20^\circ \text{ W of N}$

1c.) 22 m [E]

2.) $27.8 \text{ m at } 38^\circ \text{ N of E}$

3.) $8.0 \frac{\text{m}}{\text{s}}$ due south