

DOIT 1 and 2

ADDITION and SUBTRACTION of VECTORS -

Graphical and Analytical Compared

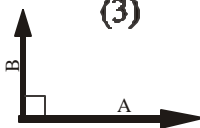
A+B (1)



(2)



(3)



(4)



(5)



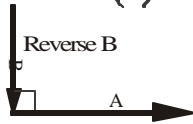
A-B = A+(-B)
(6)



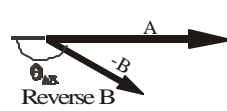
(7)



(8)



(9)



(10)



1. Do each of the above graphically using ruler and protractor.

The scale here is lengths $A = 25 \text{ mm}$ and $B = 15 \text{ mm}$ and $\theta_{AB} = 30^\circ$ or 150° , respectively. Choose and list your own scale. For example $50\text{mm} = 25 \text{ mm}$, so A becomes 50mm and B 30mm **KEEP ANGLES AND RELATIVE SIZES**

Measure and record the length and angle (relative to the x-axis, the vector A) of the resulting vector.

2. Do each of the above analytically.

Show all of your work in detail.

Record the length and direction (relative to the x-axis, the vector A) of each resulting vector.

3. Write the vectors A, B and all 10 resulting vectors in components, ordered pairs, polar, and unit vector notations.

A SUGGESTED SAMPLE DATA TABLE

Graphic Analysis Scale $A = 50\text{cm}, B = 30\text{cm}$	Analytical Analysis	%Difference
a. 3 points $C_{\text{graphical}} = \text{cm}$ 2 points $\theta_{\text{graphical}} = ^\circ$	5 points $C_{\text{analytical}} = \text{cm}$ 3 points $\theta_{\text{analytical}} = ^\circ$ 3 points unit vector, ordered pair, and polar representations	$100 * \frac{C_{\text{graphical}} - C_{\text{analytical}}}{C_{\text{graphical}}} \text{ 2p}$ $100 * \frac{q_{\text{graphical}} - q_{\text{analytical}}}{q_{\text{graphical}}} \text{ 2p}$
b. $C_{\text{graphical}} = \text{cm}$ $\theta_{\text{graphical}} = ^\circ$	$C_{\text{analytical}} = \text{cm}$ $\theta_{\text{analytical}} = ^\circ$ unit vector, ordered pair, and polar representations	$100 * \frac{C_{\text{graphical}} - C_{\text{analytical}}}{C_{\text{graphical}}}$ $100 * \frac{q_{\text{graphical}} - q_{\text{analytical}}}{q_{\text{graphical}}}$