

Name: _____

Date: _____

Program, Year & Section: _____

Score: _____

Worksheet 6 Analytical Vector Addition

Refer to the following vectors.

$\vec{A} = 750 \text{ Newtons, } 15.0^\circ \text{ W of N}$
 $\vec{B} = 700 \text{ Newtons, E}$

$\vec{C} = 850 \text{ Newtons, } 60.0^\circ \text{ S of E}$
 $\vec{D} = 525 \text{ Newtons, E}$

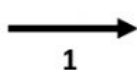
A. Which of the following is the correct approximation of the given vectors?

A _____

B _____

C _____

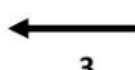
D _____



1



2



3



4



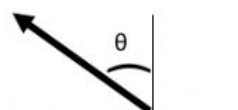
5



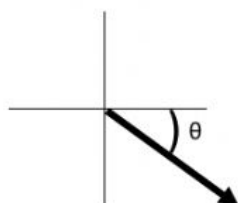
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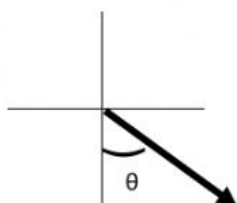
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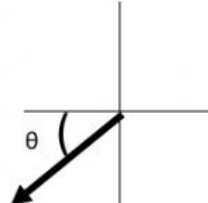
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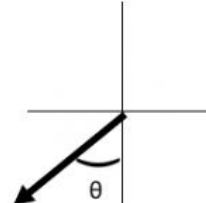
9



10



11



12

B. Find the resultant of vectors **B** and **D**.

$R_1 =$ _____ Newtons _____ Newtons

$R_1 =$ _____ Newtons (*magnitude*)

_____ (*direction*)

C. Find the resultant of vectors **B** and **(-D)**.

$R_1 =$ _____ Newtons _____ Newtons

$R_1 =$ _____ Newtons (*magnitude*)

_____ (*direction*)

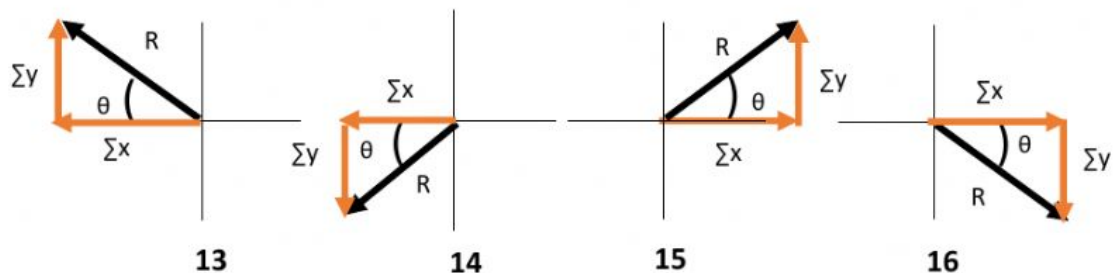
D. Find the resultant of vectors **A**, **B**, **C** and **D**.

Note: Round off all number answers to 3 significant digits. Vectors lying exactly on an axis (e.g., x or y) has a single component (along that axis only).

Vector	x-component	y-component
A	$A_x = A \cos \theta$ $= (750 \text{ Newtons}) \cos 15.0^\circ$ $= \text{_____ Newtons (mag.)}$ _____ (dir.)	$A_y = A \sin \theta$ $= (750 \text{ Newtons}) \sin 15.0^\circ$ $= \text{_____ Newtons (mag.)}$ _____ (dir.)
B	$B_x = \text{_____ Newtons (mag.)}$ _____ (dir.)	$B_y = \text{_____ Newtons (mag.)}$ _____ (dir.)
C	$C_x = C \cos \theta$ $= (850 \text{ Newtons}) \cos 60.0^\circ$ $= \text{_____ Newtons (mag.)}$ _____ (dir.)	$C_y = C \sin \theta$ $= (850 \text{ Newtons}) \sin 60.0^\circ$ $= \text{_____ Newtons (mag.)}$ _____ (dir.)
D	$D_x = \text{_____ Newtons (mag.)}$ _____ (dir.)	$D_y = \text{_____ Newtons (mag.)}$ _____ (dir.)
Σ	$\Sigma x = A_x + B_x + C_x + D_x$ $= \text{_____ Newtons (mag.)}$ _____ (dir.)	$\Sigma y = A_y + B_y + C_y + D_y$ $= \text{_____ Newtons (mag.)}$ _____ (dir.)

E. Which of the following is the correct approximation of the **R**, Σx and Σy vectors?

answer _____



magnitude	direction
$R = \sqrt{(\sum x)^2 + (\sum y)^2}$	$\theta = \arctan \frac{\sum y}{\sum x}$
$R = \sqrt{(\text{_____ Newtons})^2 + (\text{_____ Newtons})^2}$	
$R = \text{_____ Newtons}$ (magnitude)	$\theta = \arctan \frac{\text{_____ Newtons}}{\text{_____ Newtons}}$
$= \text{_____}^\circ \text{_____}$ (complete direction)	$\theta = \text{_____}^\circ$