

Physics 122: Vector Components

1. Calculate the horizontal, *East*, and vertical, *North*, components of the following vectors.
 - a. $F_a = 248 \text{ N [E}38^\circ\text{N]}$
 - b. $v = 65.6 \text{ m/s [W}56^\circ\text{N]}$
 - c. $a = 38.4 \text{ m/s}^2 \text{ [E}81^\circ\text{S]}$
 - d. $F_T = 614 \text{ N [W}22^\circ\text{S]}$
 - e. $\Delta x = 1587 \text{ m [E}33^\circ\text{N]}$
 - f. $a = 36.9 \text{ m/s}^2 \text{ [W}54^\circ\text{S]}$

2. Given the components of the following vectors, calculate the resultant vector.
 - a. $F_E = 21.4 \text{ N}, F_N = 38 \text{ N}$
 - b. $v_E = -33 \text{ m/s}, v_N = 16 \text{ N}$
 - c. $F_E = 87 \text{ N}, F_N = -66 \text{ N}$
 - d. $a_E = -18 \text{ m/s}^2, a_N = -9.5 \text{ m/s}^2$
 - e. $v_E = 45 \text{ m/s}, v_N = -77 \text{ m/s}$
 - f. $v_E = -159 \text{ m/s}, v_N = 121 \text{ m/s}$

3. Given the following three vectors, perform the indicated calculation. $\mathbf{A} = 35 \text{ m [E}25^\circ\text{N]}$, $\mathbf{B} = 61 \text{ m [W}66^\circ\text{N]}$, and $\mathbf{C} = 50 \text{ m [E}76^\circ\text{S]}$
 - a. $\mathbf{A} + \mathbf{B}$
 - b. $\mathbf{A} + \mathbf{C}$
 - c. $\mathbf{C} - \mathbf{A}$
 - d. $2\mathbf{B} - 3\mathbf{C}$
 - e. $\mathbf{A} + \mathbf{B} + \mathbf{C}$
 - f. $\mathbf{A} - \mathbf{B} + \mathbf{C}$
 - g. $-2\mathbf{A} + 5\mathbf{C}$