

## Three Dimensional Vector Operations

**Find the component form of the resultant vector.**

$$1) \vec{f} = \langle -6, -8, 8 \rangle$$

$$\vec{g} = \langle 8, -5, 3 \rangle$$

$$\text{Find: } \vec{f} + \vec{g}$$

$$2) \vec{u} = \langle 0, 9, -4 \rangle$$

$$\vec{g} = \langle 9, 7, -7 \rangle$$

$$\text{Find: } \vec{u} - \vec{g}$$

$$3) \text{ Given: } A = (-6, -3, -5) \quad B = (-4, -8, 5)$$

$$C = (-2, 3, -4) \quad D = (-6, 5, 0)$$

$$\text{Find: } \vec{AB} - \vec{CD}$$

$$4) \text{ Given: } T = (-2, 4, -1) \quad X = (3, -2, -5)$$

$$Y = (7, 5, -1) \quad Z = (7, 3, -4)$$

$$\text{Find: } \vec{TX} + \vec{YZ}$$

$$5) \vec{a} = \langle 1, -8, 5 \rangle$$

$$\vec{g} = \langle -6, 7, -7 \rangle$$

$$\text{Find: } -\vec{a} - 4\vec{g}$$

$$6) \vec{u} = \langle -2, 5, -6 \rangle$$

$$\vec{g} = \langle -2, -3, 8 \rangle$$

$$\text{Find: } 4\vec{u} + 10\vec{g}$$

$$7) \text{ Given: } A = (-6, -6, -4) \quad B = (4, -8, 7)$$

$$C = (8, 9, 5) \quad D = (7, 2, -9)$$

$$\text{Find: } 5\vec{AB} + 10\vec{CD}$$

$$8) \text{ Given: } P = (0, 9, 7) \quad Q = (-9, -4, 1)$$

$$R = (9, -9, -4) \quad S = (-8, 2, 0)$$

$$\text{Find: } 6\vec{PQ} - 5\vec{RS}$$

**Find the magnitude of the resultant vector.**

9)  $\vec{f} = \langle -9, 1, -7 \rangle$   
 $\vec{v} = \langle 4, -1, 0 \rangle$   
Find:  $\vec{f} + \vec{v}$

10)  $\vec{f} = \langle 5, 1, 0 \rangle$   
 $\vec{v} = \langle 3, 7, 7 \rangle$   
Find:  $-\vec{f} + \vec{v}$

11) Given:  $A = (-2, 3, 3)$   $B = (4, -9, 0)$   
 $C = (5, -4, 2)$   $D = (8, -5, 1)$   
Find:  $\vec{AB} - \vec{CD}$

12) Given:  $P = (-7, 7, -7)$   $Q = (1, -8, -9)$   
 $R = (-7, -3, 5)$   $S = (-3, 0, 0)$   
Find:  $-\vec{PQ} - \vec{RS}$

13)  $\vec{u} = \langle -6, -7, 1 \rangle$   
 $\vec{g} = \langle -2, 2, -8 \rangle$   
Find:  $-3\vec{u} - 10\vec{g}$

14)  $\vec{u} = \langle -4, -4, 9 \rangle$   
 $\vec{g} = \langle -8, 4, 4 \rangle$   
Find:  $2\vec{u} + 5\vec{g}$

15) Given:  $A = (8, -3, 9)$   $B = (-5, 1, 6)$   
 $C = (-4, -9, 5)$   $D = (-8, 8, -2)$   
Find:  $-\vec{AB} + \vec{CD}$

16) Given:  $T = (-3, -7, -6)$   $X = (3, 6, -1)$   
 $Y = (-9, -4, -9)$   $Z = (5, 1, -2)$   
Find:  $6\vec{TX} + 7\vec{YZ}$

## Three Dimensional Vector Operations

**Find the component form of the resultant vector.**

1)  $\vec{f} = \langle -6, -8, 8 \rangle$

$\vec{g} = \langle 8, -5, 3 \rangle$

Find:  $\vec{f} + \vec{g}$ 

$\langle 2, -13, 11 \rangle$

2)  $\vec{u} = \langle 0, 9, -4 \rangle$

$\vec{g} = \langle 9, 7, -7 \rangle$

Find:  $\vec{u} - \vec{g}$ 

$\langle -9, 2, 3 \rangle$

3) Given:  $A = (-6, -3, -5)$   $B = (-4, -8, 5)$

$C = (-2, 3, -4)$   $D = (-6, 5, 0)$

Find:  $-\vec{AB} - \vec{CD}$ 

$\langle 2, 3, -14 \rangle$

4) Given:  $T = (-2, 4, -1)$   $X = (3, -2, -5)$

$Y = (7, 5, -1)$   $Z = (7, 3, -4)$

Find:  $\vec{TX} + \vec{YZ}$ 

$\langle 5, -8, -7 \rangle$

5)  $\vec{a} = \langle 1, -8, 5 \rangle$

$\vec{g} = \langle -6, 7, -7 \rangle$

Find:  $-\vec{a} - 4\vec{g}$ 

$\langle 23, -20, 23 \rangle$

6)  $\vec{u} = \langle -2, 5, -6 \rangle$

$\vec{g} = \langle -2, -3, 8 \rangle$

Find:  $4\vec{u} + 10\vec{g}$ 

$\langle -28, -10, 56 \rangle$

7) Given:  $A = (-6, -6, -4)$   $B = (4, -8, 7)$

$C = (8, 9, 5)$   $D = (7, 2, -9)$

Find:  $5\vec{AB} + 10\vec{CD}$ 

$\langle 40, -80, -85 \rangle$

8) Given:  $P = (0, 9, 7)$   $Q = (-9, -4, 1)$

$R = (9, -9, -4)$   $S = (-8, 2, 0)$

Find:  $6\vec{PQ} - 5\vec{RS}$ 

$\langle 31, -133, -56 \rangle$

**Find the magnitude of the resultant vector.**

9)  $\vec{f} = \langle -9, 1, -7 \rangle$   
 $\vec{v} = \langle 4, -1, 0 \rangle$   
Find:  $\vec{f} + \vec{v}$

$$\sqrt{74} \approx 8.602$$

10)  $\vec{f} = \langle 5, 1, 0 \rangle$   
 $\vec{v} = \langle 3, 7, 7 \rangle$   
Find:  $-\vec{f} + \vec{v}$

$$\sqrt{89} \approx 9.434$$

11) Given:  $A = (-2, 3, 3)$   $B = (4, -9, 0)$   
 $C = (5, -4, 2)$   $D = (8, -5, 1)$   
Find:  $\vec{AB} - \vec{CD}$

$$\sqrt{134} \approx 11.576$$

12) Given:  $P = (-7, 7, -7)$   $Q = (1, -8, -9)$   
 $R = (-7, -3, 5)$   $S = (-3, 0, 0)$   
Find:  $-\vec{PQ} - \vec{RS}$

$$\sqrt{337} \approx 18.358$$

13)  $\vec{u} = \langle -6, -7, 1 \rangle$   
 $\vec{g} = \langle -2, 2, -8 \rangle$   
Find:  $-3\vec{u} - 10\vec{g}$

$$\sqrt{7374} \approx 85.872$$

14)  $\vec{u} = \langle -4, -4, 9 \rangle$   
 $\vec{g} = \langle -8, 4, 4 \rangle$   
Find:  $2\vec{u} + 5\vec{g}$

$$2\sqrt{973} \approx 62.386$$

15) Given:  $A = (8, -3, 9)$   $B = (-5, 1, 6)$   
 $C = (-4, -9, 5)$   $D = (-8, 8, -2)$   
Find:  $-\vec{AB} + \vec{CD}$

$$\sqrt{266} \approx 16.31$$

16) Given:  $T = (-3, -7, -6)$   $X = (3, 6, -1)$   
 $Y = (-9, -4, -9)$   $Z = (5, 1, -2)$   
Find:  $6\vec{TX} + 7\vec{YZ}$

$$\sqrt{36966} \approx 192.265$$