

Assignment

Date _____ Period _____

Find the component form of the resultant vector.

1) $\mathbf{a} = \langle -11, -4 \rangle$

$\mathbf{g} = \langle 12, -7 \rangle$

Find: $-\mathbf{a} + \mathbf{g}$

A) $\langle 14, -1 \rangle$

B) $\langle 16, -15 \rangle$

C) $\langle 9, -17 \rangle$

D) $\langle 23, -3 \rangle$

2) $\mathbf{u} = \langle -3, 4 \rangle$

$\mathbf{b} = \langle 2, -3 \rangle$

Find: $\mathbf{u} + \mathbf{b}$

A) $\langle 5, -4 \rangle$

B) $\langle -1, -6 \rangle$

C) $\langle -1, 1 \rangle$

D) $\langle -5, 1 \rangle$

3) $\mathbf{u} = \langle -6, -10 \rangle$

$\mathbf{g} = \langle 2, -1 \rangle$

Find: $-\mathbf{u} + \mathbf{g}$

A) $\langle -3, -2 \rangle$

B) $\langle -2, 18 \rangle$

C) $\langle 8, 9 \rangle$

D) $\langle 9, -12 \rangle$

4) $\mathbf{f} = \langle -7, 4 \rangle$

$\mathbf{g} = \langle 9, 1 \rangle$

Find: $-\mathbf{f} + \mathbf{g}$

A) $\langle 16, -3 \rangle$

B) $\langle 21, -6 \rangle$

C) $\langle -15, -2 \rangle$

D) $\langle -3, -17 \rangle$

5) $\mathbf{u} = \langle -1, -12 \rangle$

$\mathbf{g} = \langle -5, 9 \rangle$

Find: $\mathbf{u} + \mathbf{g}$

A) $\langle -6, -3 \rangle$

B) $\langle -9, -6 \rangle$

C) $\langle -13, -4 \rangle$

D) $\langle -2, -18 \rangle$

6) $\mathbf{u} = \langle -4, 12 \rangle$

$\mathbf{g} = \langle 10, -4 \rangle$

Find: $\mathbf{u} + \mathbf{g}$

A) $\langle -4, 0 \rangle$

B) $\langle 16, -4 \rangle$

C) $\langle -13, -9 \rangle$

D) $\langle 6, 8 \rangle$

7) $\mathbf{f} = \langle -2, 9 \rangle$

$\mathbf{v} = \langle -11, -5 \rangle$

Find: $\mathbf{f} + \mathbf{v}$

A) $\langle 19, -8 \rangle$

B) $\langle -13, 4 \rangle$

C) $\langle 2, 3 \rangle$

D) $\langle 1, -7 \rangle$

8) $\mathbf{u} = \langle -7, 2 \rangle$

$\mathbf{g} = \langle -8, -7 \rangle$

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

A) $\langle 5, 10 \rangle$

B) $\langle -13, 4 \rangle$

C) $\langle 1, 9 \rangle$

D) $\langle 2, 7 \rangle$

9) $\mathbf{a} = \langle 12, -12 \rangle$

$\mathbf{g} = \langle 4, -6 \rangle$

Find: $\mathbf{a} + \mathbf{g}$

A) $\langle 16, -18 \rangle$

B) $\langle 6, -20 \rangle$

C) $\langle -11, 9 \rangle$

D) $\langle 16, -2 \rangle$

10) $\mathbf{f} = \langle 8, -5 \rangle$

$\mathbf{v} = \langle 5, 8 \rangle$

Find: $-\mathbf{f} - \mathbf{v}$

A) $\langle 16, 10 \rangle$

B) $\langle 18, -8 \rangle$

C) $\langle 2, 16 \rangle$

D) $\langle -13, -3 \rangle$

11) $\mathbf{u} = \langle 10, -2 \rangle$

$\mathbf{v} = \langle 9, -10 \rangle$

Find: $-\mathbf{u} + \mathbf{v}$

A) $\langle -1, -8 \rangle$

B) $\langle 3, 7 \rangle$

C) $\langle 1, -2 \rangle$

D) $\langle -13, -6 \rangle$

12) $\mathbf{f} = \langle 11, -5 \rangle$

$\mathbf{g} = \langle -4, -8 \rangle$

Find: $\mathbf{f} - \mathbf{g}$

A) $\langle 15, 3 \rangle$

B) $\langle 6, 4 \rangle$

C) $\langle -11, 23 \rangle$

D) $\langle 2, 17 \rangle$

13) $\mathbf{f} = \langle 5, 4 \rangle$

$\mathbf{g} = \langle 4, -6 \rangle$

Find: $-\mathbf{f} - \mathbf{g}$

A) $\langle -9, 2 \rangle$

B) $\langle 5, 11 \rangle$

C) $\langle 7, -3 \rangle$

D) $\langle -7, -3 \rangle$

14) $\mathbf{u} = \langle 0, 8 \rangle$

$\mathbf{v} = \langle -12, -10 \rangle$

Find: $\mathbf{u} - \mathbf{v}$

A) $\langle 0, -13 \rangle$

B) $\langle 12, 18 \rangle$

C) $\langle 1, 21 \rangle$

D) $\langle -1, -1 \rangle$

15) $\mathbf{f} = \langle 9, -10 \rangle$

$\mathbf{v} = \langle -2, 3 \rangle$

Find: $-\mathbf{f} + \mathbf{v}$

A) $\langle 1, -13 \rangle$

B) $\langle -11, 13 \rangle$

C) $\langle 8, 4 \rangle$

D) $\langle -9, -8 \rangle$

16) $\mathbf{u} = \langle 5, -8 \rangle$

$\mathbf{g} = \langle 2, 12 \rangle$

Find: $\mathbf{u} + \mathbf{g}$

A) $\langle 13, 0 \rangle$

B) $\langle 23, -13 \rangle$

C) $\langle 7, 4 \rangle$

D) $\langle -19, 9 \rangle$

17) $\mathbf{f} = \langle -9, -2 \rangle$

$\mathbf{g} = \langle 11, 8 \rangle$

Find: $\mathbf{f} - \mathbf{g}$

A) $\langle -14, 0 \rangle$

B) $\langle -3, 11 \rangle$

C) $\langle -20, -10 \rangle$

D) $\langle -20, 1 \rangle$

18) $\mathbf{f} = \langle 10, 0 \rangle$

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

Find: $\mathbf{f} - \mathbf{g}$

A) $\langle 5, 10 \rangle$

B) $\langle 9, 12 \rangle$

C) $\langle 5, 3 \rangle$

D) $\langle -9, -6 \rangle$

19) $\mathbf{f} = \langle -11, 0 \rangle$

$\mathbf{v} = \langle 6, 11 \rangle$

Find: $\mathbf{f} + \mathbf{v}$

A) $\langle -5, 11 \rangle$

B) $\langle -10, 2 \rangle$

C) $\langle -4, -5 \rangle$

D) $\langle 17, -3 \rangle$

20) $\mathbf{a} = \langle 7, -11 \rangle$

$\mathbf{g} = \langle 11, 5 \rangle$

Find: $\mathbf{a} - \mathbf{g}$

A) $\langle -9, 8 \rangle$

B) $\langle -4, -16 \rangle$

C) $\langle 15, -8 \rangle$

D) $\langle -7, 0 \rangle$

Find the magnitude and direction angle of the resultant vector.

21) $\mathbf{u} = \langle 10, -4 \rangle$

$\mathbf{v} = \langle -6, 8 \rangle$

Find: $-\mathbf{u} - \mathbf{v}$

A) 10; 53.13°

B) $2\sqrt{73} \approx 17.088$; 290.56°

C) $4\sqrt{2} \approx 5.657$; 225°

D) $2\sqrt{61} \approx 15.62$; 140.19°

22) $\mathbf{f} = \langle 2, 8 \rangle$

$\mathbf{g} = \langle 12, 0 \rangle$

Find: $\mathbf{f} - \mathbf{g}$

A) $\sqrt{613} \approx 24.759$; 43.36°

B) $4\sqrt{2} \approx 5.657$; 315°

C) $2\sqrt{41} \approx 12.806$; 141.34°

D) $\sqrt{181} \approx 13.454$; 228.01°

23) $\mathbf{f} = \langle -4, -6 \rangle$

$\mathbf{b} = \langle 3, 4 \rangle$

Find: $-\mathbf{f} - \mathbf{b}$

A) $\sqrt{137} \approx 11.705$; 160.02°

B) $2\sqrt{13} \approx 7.211$; 33.69°

C) $\sqrt{226} \approx 15.033$; 266.19°

D) $\sqrt{5} \approx 2.236$; 63.43°

24) $\mathbf{f} = \langle 12, -2 \rangle$

$\mathbf{g} = \langle -1, 7 \rangle$

Find: $-\mathbf{f} + \mathbf{g}$

A) $\sqrt{485} \approx 22.023$; 39.47°

B) $5\sqrt{10} \approx 15.811$; 145.3°

C) $6\sqrt{2} \approx 8.485$; 45°

D) $\sqrt{265} \approx 16.279$; 132.51°

25) $\mathbf{u} = \langle -11, 9 \rangle$

$\mathbf{v} = \langle 12, -9 \rangle$

Find: $\mathbf{u} + \mathbf{v}$

A) $3\sqrt{34} \approx 17.493$; 329.04°

B) $\sqrt{185} \approx 13.601$; 17.1°

C) $4\sqrt{13} \approx 14.422$; 123.69°

D) 1; 0°

26) $\mathbf{f} = \langle 6, 0 \rangle$

$\mathbf{b} = \langle 10, 12 \rangle$

Find: $-\mathbf{f} + \mathbf{b}$

A) $3\sqrt{13} \approx 10.817$; 56.31°

B) $\sqrt{41} \approx 6.403$; 308.66°

C) $\sqrt{181} \approx 13.454$; 138.01°

D) $4\sqrt{10} \approx 12.649$; 71.57°

27) $\mathbf{u} = \langle -1, -10 \rangle$

$\mathbf{v} = \langle -5, -4 \rangle$

Find: $-\mathbf{u} + \mathbf{v}$

- A) $\sqrt{274} \approx 16.553; 115.02^\circ$
 B) $5\sqrt{10} \approx 15.811; 34.7^\circ$
 C) $\sqrt{197} \approx 14.036; 184.09^\circ$
 D) $2\sqrt{13} \approx 7.211; 123.69^\circ$

28) $\mathbf{u} = \langle -7, 5 \rangle$

$\mathbf{g} = \langle -4, 1 \rangle$

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

- A) 1; 0°
 B) $\sqrt{157} \approx 12.53; 331.39^\circ$
 C) $\sqrt{82} \approx 9.055; 83.66^\circ$
 D) $3\sqrt{13} \approx 10.817; 33.69^\circ$

29) $\mathbf{f} = \langle -7, 7 \rangle$

$\mathbf{v} = \langle 5, 8 \rangle$

Find: $-\mathbf{f} + \mathbf{v}$

- A) $\sqrt{145} \approx 12.042; 4.76^\circ$
 B) $2\sqrt{29} \approx 10.77; 338.2^\circ$
 C) 4; 90°
 D) $2\sqrt{41} \approx 12.806; 51.34^\circ$

30) $\mathbf{u} = \langle 3, 7 \rangle$

$\mathbf{v} = \langle -5, 10 \rangle$

Find: $\mathbf{u} + \mathbf{v}$

- A) $2\sqrt{146} \approx 24.166; 294.44^\circ$
 B) $\sqrt{53} \approx 7.28; 74.05^\circ$
 C) $\sqrt{293} \approx 17.117; 96.71^\circ$
 D) $3\sqrt{5} \approx 6.708; 63.43^\circ$

31) $\mathbf{u} = \langle 5, 4 \rangle$

$\mathbf{g} = \langle -6, 1 \rangle$

Find: $\mathbf{u} + \mathbf{g}$

- A) $\sqrt{26} \approx 5.099; 101.31^\circ$
 B) 2; 0°
 C) $\sqrt{82} \approx 9.055; 6.34^\circ$
 D) $2\sqrt{58} \approx 15.232; 113.2^\circ$

32) $\mathbf{f} = \langle 12, -11 \rangle$

$\mathbf{v} = \langle 1, 2 \rangle$

Find: $\mathbf{f} + \mathbf{v}$

- A) $\sqrt{5} \approx 2.236; 26.57^\circ$
 B) $\sqrt{29} \approx 5.385; 338.2^\circ$
 C) $5\sqrt{10} \approx 15.811; 325.3^\circ$
 D) $\sqrt{130} \approx 11.402; 105.26^\circ$

33) $\mathbf{u} = \langle -8, -4 \rangle$

$\mathbf{g} = \langle -11, 6 \rangle$

Find: $-\mathbf{u} + \mathbf{g}$

- A) $\sqrt{10} \approx 3.162; 108.43^\circ$
 B) $\sqrt{610} \approx 24.698; 148.24^\circ$
 C) $2\sqrt{5} \approx 4.472; 296.57^\circ$
 D) $\sqrt{109} \approx 10.44; 106.7^\circ$

34) $\mathbf{u} = \langle 7, 11 \rangle$

$\mathbf{v} = \langle 2, 5 \rangle$

Find: $-\mathbf{u} - \mathbf{v}$

- A) $\sqrt{53} \approx 7.28; 164.05^\circ$
 B) $\sqrt{202} \approx 14.213; 39.29^\circ$
 C) $\sqrt{274} \approx 16.553; 205.02^\circ$
 D) $\sqrt{337} \approx 18.358; 240.64^\circ$

35) $\mathbf{u} = \langle -1, 6 \rangle$
 $\mathbf{v} = \langle -7, -8 \rangle$
 Find: $\mathbf{u} + \mathbf{v}$

- A) $4\sqrt{2} \approx 5.657; 225^\circ$
 B) $\sqrt{85} \approx 9.22; 102.53^\circ$
 C) $2\sqrt{17} \approx 8.246; 194.04^\circ$
 D) $15\sqrt{2} \approx 21.213; 135^\circ$

36) $\mathbf{f} = \langle 12, 6 \rangle$
 $\mathbf{v} = \langle 2, -3 \rangle$
 Find: $\mathbf{f} + \mathbf{v}$

- A) $5\sqrt{13} \approx 18.028; 3.18^\circ$
 B) $\sqrt{205} \approx 14.318; 12.09^\circ$
 C) $\sqrt{466} \approx 21.587; 283.39^\circ$
 D) $3\sqrt{2} \approx 4.243; 315^\circ$

37) $\mathbf{u} = \langle 0, -12 \rangle$
 $\mathbf{b} = \langle 2, 12 \rangle$
 Find: $\mathbf{u} + \mathbf{b}$

- A) $2; 0^\circ$
 B) $5\sqrt{10} \approx 15.811; 325.3^\circ$
 C) $\sqrt{106} \approx 10.296; 299.05^\circ$
 D) $2\sqrt{17} \approx 8.246; 165.96^\circ$

38) $\mathbf{u} = \langle 2, 3 \rangle$
 $\mathbf{g} = \langle 11, 2 \rangle$
 Find: $\mathbf{u} + \mathbf{g}$

- A) $14; 0^\circ$
 B) $\sqrt{185} \approx 13.601; 233.97^\circ$
 C) $\sqrt{290} \approx 17.029; 266.63^\circ$
 D) $\sqrt{194} \approx 13.928; 21.04^\circ$

39) $\mathbf{u} = \langle -4, -12 \rangle$
 $\mathbf{g} = \langle 4, -10 \rangle$
 Find: $-\mathbf{u} + \mathbf{g}$

- A) $3\sqrt{26} \approx 15.297; 281.31^\circ$
 B) $\sqrt{97} \approx 9.849; 113.96^\circ$
 C) $\sqrt{293} \approx 17.117; 96.71^\circ$
 D) $2\sqrt{17} \approx 8.246; 14.04^\circ$

40) $\mathbf{f} = \langle 5, 1 \rangle$
 $\mathbf{v} = \langle -10, -3 \rangle$
 Find: $\mathbf{f} + \mathbf{v}$

- A) $\sqrt{29} \approx 5.385; 201.8^\circ$
 B) $2\sqrt{130} \approx 22.804; 52.13^\circ$
 C) $18; 270^\circ$
 D) $\sqrt{410} \approx 20.248; 122.91^\circ$

Find the component form of the resultant vector.

41) $\mathbf{a} = \langle -2, -4 \rangle$
 Unit vector in the opposite direction of \mathbf{a}

- A) $\left\langle -\frac{3}{5}, \frac{4}{5} \right\rangle$ B) $\left\langle \frac{20}{29}, -\frac{21}{29} \right\rangle$
 C) $\left\langle \frac{\sqrt{5}}{5}, \frac{2\sqrt{5}}{5} \right\rangle$ D) $\left\langle \frac{\sqrt{65}}{65}, -\frac{8\sqrt{65}}{65} \right\rangle$

42) $\mathbf{u} = \langle -16, 30 \rangle$
 Unit vector in the opposite direction of \mathbf{u}

- A) $\left\langle \frac{5}{13}, \frac{12}{13} \right\rangle$ B) $\left\langle \frac{8}{17}, -\frac{15}{17} \right\rangle$
 C) $\left\langle -\frac{3}{5}, \frac{4}{5} \right\rangle$ D) $\left\langle -\frac{\sqrt{5}}{5}, \frac{2\sqrt{5}}{5} \right\rangle$

43) $\mathbf{u} = \langle 16, -2\sqrt{161} \rangle$

Unit vector in the direction of \mathbf{u}

- A) $\left\langle \frac{5\sqrt{29}}{29}, \frac{2\sqrt{29}}{29} \right\rangle$
- B) $\langle -1, 0 \rangle$
- C) $\left\langle \frac{8}{15}, -\frac{\sqrt{161}}{15} \right\rangle$
- D) $\left\langle \frac{7\sqrt{2}}{10}, \frac{\sqrt{2}}{10} \right\rangle$

44) $\mathbf{f} = \langle 12, 9 \rangle$

Unit vector in the direction of \mathbf{f}

- A) $\left\langle \frac{4}{5}, \frac{3}{5} \right\rangle$
- B) $\left\langle \frac{5\sqrt{29}}{29}, -\frac{2\sqrt{29}}{29} \right\rangle$
- C) $\left\langle -\frac{\sqrt{2}}{2}, \frac{\sqrt{2}}{2} \right\rangle$
- D) $\left\langle \frac{\sqrt{323}}{18}, -\frac{1}{18} \right\rangle$

45) $\mathbf{u} = \langle 7, 24 \rangle$

Unit vector in the opposite direction of \mathbf{u}

- A) $\left\langle -\frac{7}{25}, -\frac{24}{25} \right\rangle$
- B) $\left\langle \frac{20}{29}, -\frac{21}{29} \right\rangle$
- C) $\left\langle -\frac{5\sqrt{34}}{34}, -\frac{3\sqrt{34}}{34} \right\rangle$
- D) $\left\langle \frac{\sqrt{2}}{2}, \frac{\sqrt{2}}{2} \right\rangle$

46) $\mathbf{f} = \langle 2, -12 \rangle$

Unit vector in the direction of \mathbf{f}

- A) $\left\langle \frac{4\sqrt{97}}{97}, \frac{9\sqrt{97}}{97} \right\rangle$
- B) $\left\langle \frac{\sqrt{37}}{37}, -\frac{6\sqrt{37}}{37} \right\rangle$
- C) $\left\langle \frac{\sqrt{2}}{2}, \frac{\sqrt{2}}{2} \right\rangle$
- D) $\left\langle \frac{\sqrt{143}}{12}, -\frac{1}{12} \right\rangle$

47) $\mathbf{u} = \langle 8, -2 \rangle$

Unit vector in the direction of \mathbf{u}

- A) $\left\langle \frac{5\sqrt{146}}{146}, -\frac{11\sqrt{146}}{146} \right\rangle$
- B) $\left\langle \frac{12}{37}, -\frac{35}{37} \right\rangle$
- C) $\left\langle \frac{7}{25}, \frac{24}{25} \right\rangle$
- D) $\left\langle \frac{4\sqrt{17}}{17}, -\frac{\sqrt{17}}{17} \right\rangle$

48) $\mathbf{u} = \langle 16, -30 \rangle$

Unit vector in the opposite direction of \mathbf{u}

- A) $\left\langle -\frac{11\sqrt{146}}{146}, -\frac{5\sqrt{146}}{146} \right\rangle$
- B) $\left\langle -\frac{8}{17}, \frac{15}{17} \right\rangle$
- C) $\left\langle -\frac{3\sqrt{58}}{58}, -\frac{7\sqrt{58}}{58} \right\rangle$
- D) $\left\langle \frac{\sqrt{5}}{5}, -\frac{2\sqrt{5}}{5} \right\rangle$

49) $\mathbf{f} = \langle -10, 9 \rangle$

Unit vector in the opposite direction of \mathbf{f}

A) $\left\langle -\frac{9\sqrt{85}}{85}, -\frac{2\sqrt{85}}{85} \right\rangle$

B) $\left\langle \frac{5}{13}, \frac{12}{13} \right\rangle$

C) $\left\langle \frac{3\sqrt{2}}{5}, \frac{\sqrt{7}}{5} \right\rangle$

D) $\left\langle \frac{10\sqrt{181}}{181}, -\frac{9\sqrt{181}}{181} \right\rangle$

50) $\mathbf{u} = \langle 16, 30 \rangle$

Unit vector in the direction of \mathbf{u}

A) $\left\langle \frac{9}{41}, \frac{40}{41} \right\rangle$

B) $\left\langle \frac{2\sqrt{29}}{29}, \frac{5\sqrt{29}}{29} \right\rangle$

C) $\left\langle \frac{3}{5}, \frac{4}{5} \right\rangle$

D) $\left\langle \frac{8}{17}, \frac{15}{17} \right\rangle$

51) $\mathbf{u} = \langle -12, -\sqrt{481} \rangle$

Unit vector in the direction of \mathbf{u}

A) $\left\langle -\frac{12}{25}, -\frac{\sqrt{481}}{25} \right\rangle$

B) $\left\langle \frac{8\sqrt{145}}{145}, -\frac{9\sqrt{145}}{145} \right\rangle$

C) $\langle 1, 0 \rangle$

D) $\left\langle -\frac{5\sqrt{106}}{106}, -\frac{9\sqrt{106}}{106} \right\rangle$

52) $\mathbf{f} = \langle -20, 21 \rangle$

Unit vector in the opposite direction of \mathbf{f}

A) $\left\langle -\frac{8}{17}, \frac{15}{17} \right\rangle$

B) $\left\langle \frac{9}{41}, \frac{40}{41} \right\rangle$

C) $\left\langle \frac{20}{29}, -\frac{21}{29} \right\rangle$

D) $\left\langle \frac{\sqrt{145}}{17}, \frac{12}{17} \right\rangle$

53) $\mathbf{f} = \langle 15, 36 \rangle$

Unit vector in the opposite direction of \mathbf{f}

A) $\left\langle -\frac{5}{13}, -\frac{12}{13} \right\rangle$

B) $\left\langle \frac{7\sqrt{2}}{10}, -\frac{\sqrt{2}}{10} \right\rangle$

C) $\left\langle \frac{2\sqrt{3}}{9}, -\frac{\sqrt{69}}{9} \right\rangle$

D) $\left\langle \frac{8\sqrt{145}}{145}, -\frac{9\sqrt{145}}{145} \right\rangle$

54) $\mathbf{f} = \langle 12, -35 \rangle$

Unit vector in the opposite direction of \mathbf{f}

A) $\left\langle \frac{\sqrt{7}}{4}, \frac{3}{4} \right\rangle$

B) $\left\langle -\frac{9}{29}, \frac{2\sqrt{190}}{29} \right\rangle$

C) $\left\langle -\frac{12}{37}, \frac{35}{37} \right\rangle$

D) $\left\langle \frac{11\sqrt{137}}{137}, \frac{4\sqrt{137}}{137} \right\rangle$

55) $\mathbf{u} = \langle 8, -9 \rangle$

Unit vector in the opposite direction of \mathbf{u}

- A) $\left\langle -\frac{\sqrt{145}}{145}, -\frac{12\sqrt{145}}{145} \right\rangle$
 B) $\left\langle -\frac{8\sqrt{145}}{145}, \frac{9\sqrt{145}}{145} \right\rangle$
 C) $\left\langle \frac{3}{5}, \frac{4}{5} \right\rangle$
 D) $\left\langle -\frac{20}{29}, -\frac{21}{29} \right\rangle$

56) $\mathbf{u} = \langle 15, 20 \rangle$

Unit vector in the direction of \mathbf{u}

- A) $\left\langle \frac{3}{5}, \frac{4}{5} \right\rangle$
 B) $\left\langle \frac{8}{17}, \frac{15}{17} \right\rangle$
 C) $\left\langle \frac{9\sqrt{145}}{145}, -\frac{8\sqrt{145}}{145} \right\rangle$
 D) $\left\langle \frac{2}{3}, -\frac{\sqrt{5}}{3} \right\rangle$

57) $\mathbf{f} = \langle 29, -2\sqrt{30} \rangle$

Unit vector in the direction of \mathbf{f}

- A) $\langle -1, 0 \rangle$
 B) $\left\langle \frac{29}{31}, -\frac{2\sqrt{30}}{31} \right\rangle$
 C) $\left\langle -\frac{2\sqrt{13}}{13}, \frac{3\sqrt{13}}{13} \right\rangle$
 D) $\left\langle \frac{5}{13}, \frac{12}{13} \right\rangle$

58) $\mathbf{f} = \langle -12, 12 \rangle$

Unit vector in the direction of \mathbf{f}

- A) $\left\langle -\frac{4}{5}, -\frac{3}{5} \right\rangle$
 B) $\left\langle \frac{2\sqrt{5}}{5}, \frac{\sqrt{5}}{5} \right\rangle$
 C) $\left\langle -\frac{\sqrt{2}}{2}, \frac{\sqrt{2}}{2} \right\rangle$
 D) $\left\langle \frac{3}{5}, \frac{4}{5} \right\rangle$

59) $\mathbf{u} = \langle 10, 24 \rangle$

Unit vector in the opposite direction of \mathbf{u}

- A) $\left\langle \frac{8\sqrt{73}}{73}, -\frac{3\sqrt{73}}{73} \right\rangle$
 B) $\left\langle -\frac{7\sqrt{113}}{113}, -\frac{8\sqrt{113}}{113} \right\rangle$
 C) $\left\langle -\frac{2\sqrt{53}}{53}, -\frac{7\sqrt{53}}{53} \right\rangle$
 D) $\left\langle -\frac{5}{13}, -\frac{12}{13} \right\rangle$

60) $\mathbf{u} = \langle 12, 35 \rangle$

Unit vector in the opposite direction of \mathbf{u}

- A) $\left\langle -\frac{12}{37}, -\frac{35}{37} \right\rangle$
 B) $\left\langle \frac{3\sqrt{10}}{10}, -\frac{\sqrt{10}}{10} \right\rangle$
 C) $\left\langle \frac{8\sqrt{113}}{113}, -\frac{7\sqrt{113}}{113} \right\rangle$
 D) $\left\langle \frac{9}{41}, \frac{40}{41} \right\rangle$

Find the dot product of the given vectors.

61) $\mathbf{u} = \langle 1, 2 \rangle$
 $\mathbf{v} = \langle 0, -2 \rangle$

- A) 21 B) -88
C) -64 D) -4

62) $\mathbf{u} = \langle 6, 5 \rangle$
 $\mathbf{v} = \langle -8, 3 \rangle$

- A) -33 B) 63
C) 55 D) 30

63) $\mathbf{u} = \langle -7, -5 \rangle$
 $\mathbf{v} = \langle 7, -7 \rangle$

- A) 64 B) -16
C) 22 D) -14

64) $\mathbf{u} = \langle 4, -7 \rangle$
 $\mathbf{v} = \langle 8, -3 \rangle$

- A) -56 B) 42
C) -2 D) 53

65) $\mathbf{u} = \langle 4, 2 \rangle$
 $\mathbf{v} = \langle 0, -1 \rangle$

- A) -48 B) -44
C) 36 D) -2

66) $\mathbf{u} = \langle 9, 1 \rangle$
 $\mathbf{v} = \langle -2, -3 \rangle$

- A) 37 B) -24
C) -47 D) -21

67) $\mathbf{u} = \langle 9, -6 \rangle$
 $\mathbf{v} = \langle 9, -8 \rangle$

- A) 129 B) 15
C) -60 D) -31

68) $\mathbf{u} = \langle -3, 5 \rangle$
 $\mathbf{v} = \langle 0, 6 \rangle$

- A) 26 B) -26
C) 30 D) -34

69) $\mathbf{u} = \langle -9, 5 \rangle$
 $\mathbf{v} = \langle -2, -6 \rangle$

- A) -12 B) 30
C) -31 D) 21

70) $\mathbf{u} = \langle -8, -6 \rangle$
 $\mathbf{v} = \langle -9, 0 \rangle$

- A) 72 B) 81
C) -114 D) 6

71) $\mathbf{u} = \langle -6, 8 \rangle$
 $\mathbf{v} = \langle -7, 5 \rangle$

- A) 82 B) 14
C) -27 D) -20

72) $\mathbf{u} = \langle -4, -1 \rangle$
 $\mathbf{v} = \langle 8, -9 \rangle$

- A) -63 B) -78
C) -31 D) -23

73) $\mathbf{u} = \langle 0, 7 \rangle$
 $\mathbf{v} = \langle 7, 5 \rangle$

- A) -64 B) 12
 C) 35 D) 69

74) $\mathbf{u} = \langle -2, 7 \rangle$
 $\mathbf{v} = \langle 4, 2 \rangle$

- A) -19 B) 6
 C) 84 D) 25

75) $\mathbf{u} = \langle -4, 5 \rangle$
 $\mathbf{v} = \langle -5, -1 \rangle$

- A) 15 B) 78
 C) 43 D) -67

76) $\mathbf{u} = \langle -1, -3 \rangle$
 $\mathbf{v} = \langle 7, 5 \rangle$

- A) -22 B) 47
 C) 0 D) -34

77) $\mathbf{u} = \langle 7, -6 \rangle$
 $\mathbf{v} = \langle 5, -7 \rangle$

- A) 24 B) 104
 C) 77 D) -33

78) $\mathbf{u} = \langle 5, 5 \rangle$
 $\mathbf{v} = \langle 3, 8 \rangle$

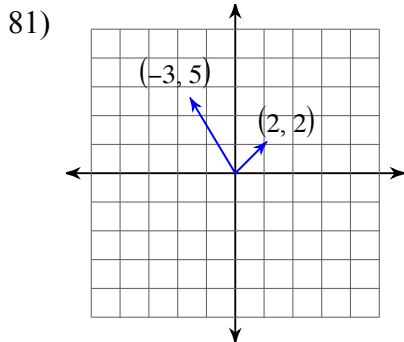
- A) -56 B) 55
 C) 81 D) 2

79) $\mathbf{u} = \langle -4, -8 \rangle$
 $\mathbf{v} = \langle 3, 7 \rangle$

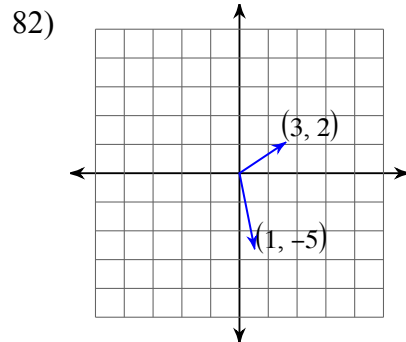
- A) 4 B) -68
 C) 49 D) 20

80) $\mathbf{u} = \langle -4, -3 \rangle$
 $\mathbf{v} = \langle 3, 1 \rangle$

- A) -15 B) 5
 C) 16 D) 25

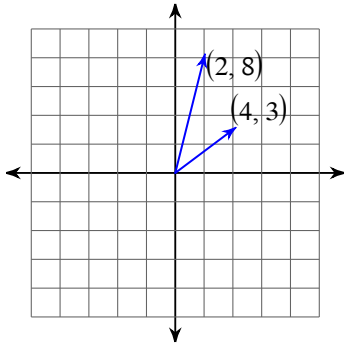


- A) -16 B) 14
 C) -3 D) 4



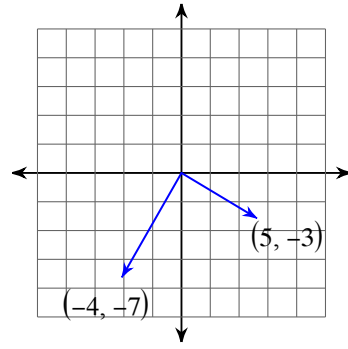
- A) -32 B) -7
 C) 65 D) -4

83)



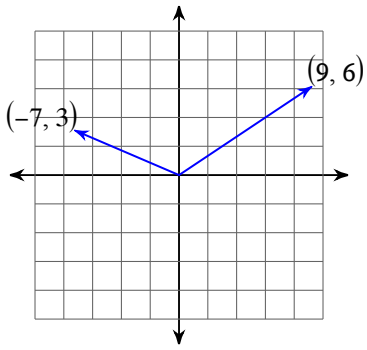
- A) 42 B) -63
C) 21 D) 32

84)



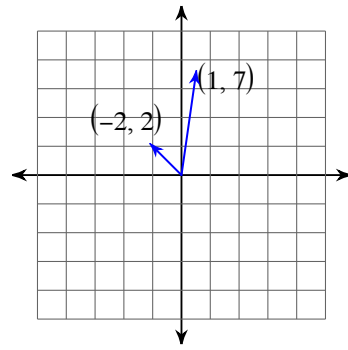
- A) -54 B) 0
C) 1 D) -46

85)



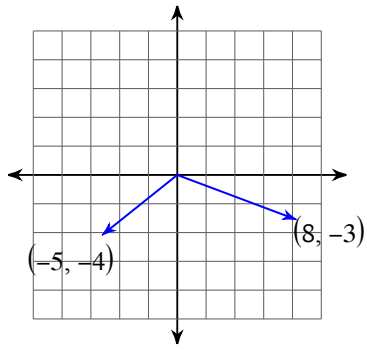
- A) -45 B) -22
C) -55 D) 42

86)



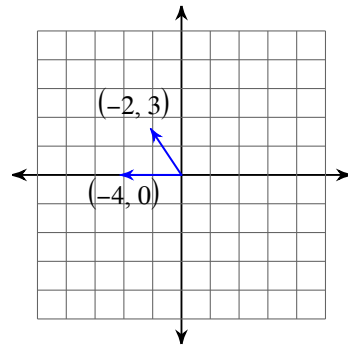
- A) -3 B) 35
C) 12 D) -10

87)



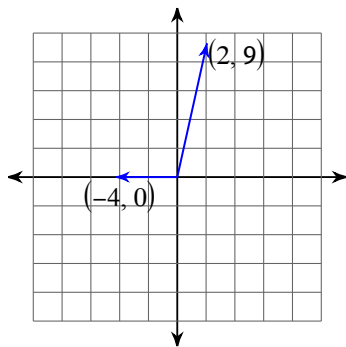
- A) -32 B) -28
C) -10 D) -20

88)



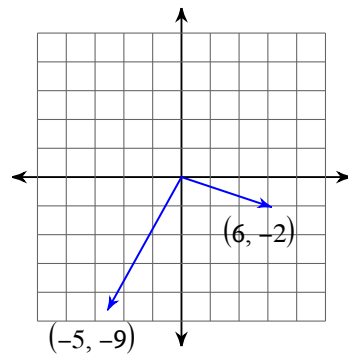
- A) 8 B) 6
C) 37 D) -78

89)



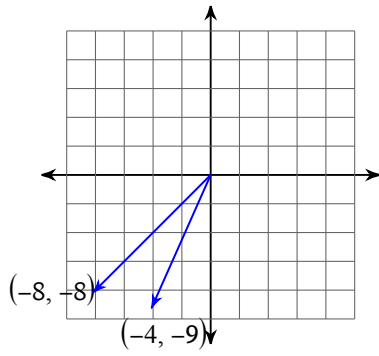
- A) -8 B) 8
C) 32 D) -14

90)



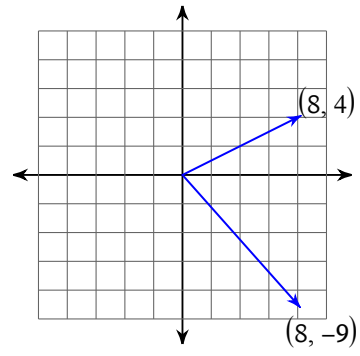
- A) -19 B) -12
C) -24 D) 34

91)



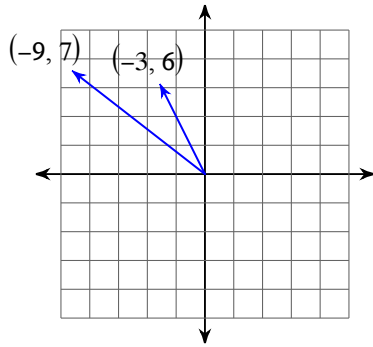
- A) -54 B) 24
C) 104 D) -6

92)



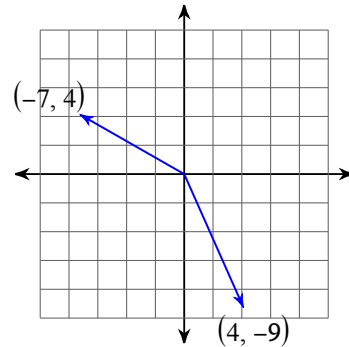
- A) 28 B) 8
C) -6 D) 55

93)

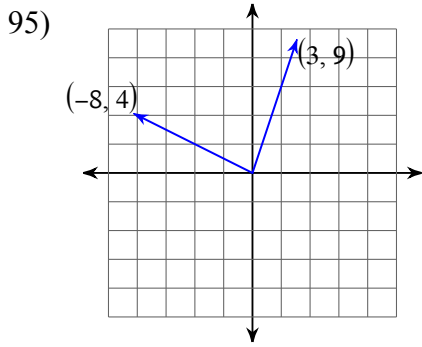


- A) 0 B) 26
C) 69 D) 13

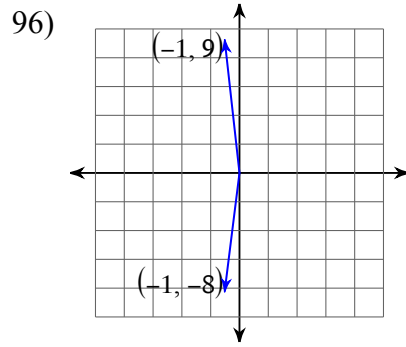
94)



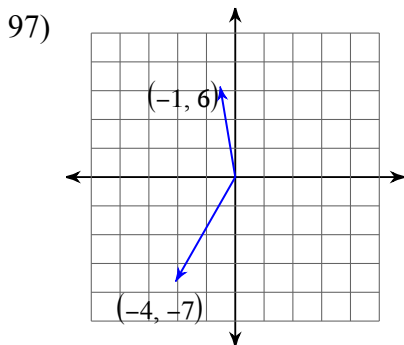
- A) -64 B) -7
C) 40 D) 45



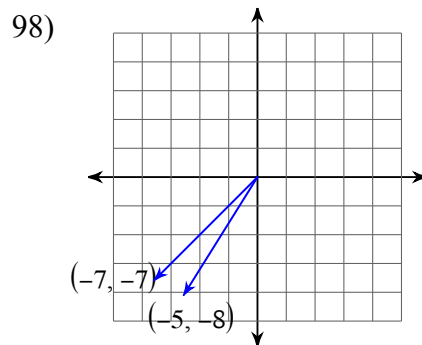
- A) 12 B) 51
C) -62 D) -21



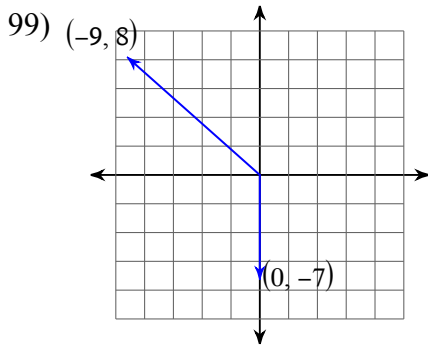
- A) -10 B) -71
C) 61 D) 3



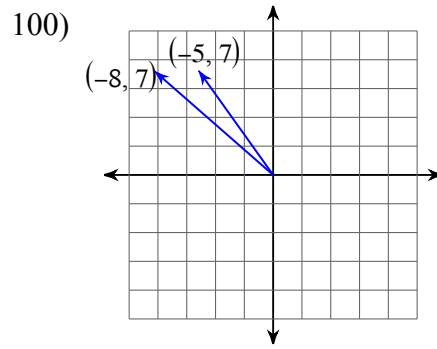
- A) -52 B) -36
C) -35 D) -38



- A) -10 B) -3
C) -14 D) 91



- A) 19 B) -16
C) -45 D) -56



- A) -57 B) 89
C) 46 D) -42

Find the measure of the angle between the two vectors.

101) $\mathbf{u} = \langle -3, -1 \rangle$
 $\mathbf{v} = \langle -8, -4 \rangle$

- A) 120.75° B) 139.61°
C) 142.94° D) 8.13°

102) $\mathbf{u} = \langle 1, -8 \rangle$
 $\mathbf{v} = \langle 3, 7 \rangle$

- A) 149.68° B) 177.84°
C) 107.1° D) 23.96°

103) $\mathbf{u} = \langle -9, -1 \rangle$
 $\mathbf{v} = \langle 4, 2 \rangle$

- A) 159.78° B) 166.33°
C) 128.52° D) 74.05°

104) $\mathbf{u} = \langle -9, 1 \rangle$
 $\mathbf{v} = \langle 3, -9 \rangle$

- A) 68.39° B) 22.62°
C) 114.78° D) 167.47°

105) $\mathbf{u} = \langle 5, 8 \rangle$
 $\mathbf{v} = \langle 6, 4 \rangle$

- A) 21.61° B) 24.3°
C) 26.57° D) 82.87°

106) $\mathbf{u} = \langle -7, 0 \rangle$
 $\mathbf{v} = \langle -6, 3 \rangle$

- A) 26.57° B) 15.07°
C) 30.96° D) 79.7°

107) $\mathbf{u} = \langle -5, -2 \rangle$
 $\mathbf{v} = \langle 3, -2 \rangle$

- A) 2.64° B) 21.8°
C) 173.09° D) 124.51°

108) $\mathbf{u} = \langle -8, 9 \rangle$
 $\mathbf{v} = \langle 9, -4 \rangle$

- A) 63.43° B) 155.6°
C) 49.4° D) 47.6°

109) $\mathbf{u} = \langle -3, 9 \rangle$
 $\mathbf{v} = \langle -5, 2 \rangle$

- A) 49.76° B) 15.95°
C) 19.44° D) 59.04°

110) $\mathbf{u} = \langle 2, 7 \rangle$
 $\mathbf{v} = \langle -3, 6 \rangle$

- A) 139.64° B) 90°
C) 42.51° D) 86.19°

111) $\mathbf{u} = \langle -7, -4 \rangle$
 $\mathbf{v} = \langle 7, -6 \rangle$

- A) 167.01° B) 91.01°
C) 67.83° D) 109.65°

112) $\mathbf{u} = \langle 0, 4 \rangle$
 $\mathbf{v} = \langle -4, 7 \rangle$

- A) 160.35° B) 116.57°
C) 12.53° D) 29.74°

113) $\mathbf{u} = \langle 0, -6 \rangle$
 $\mathbf{v} = \langle 1, -2 \rangle$

- A) 165.96° B) 26.57°
C) 104.22° D) 24.62°

114) $\mathbf{u} = \langle 6, 4 \rangle$
 $\mathbf{v} = \langle -7, -5 \rangle$

- A) 169.7° B) 159.37°
C) 178.15° D) 30.96°

115) $\mathbf{u} = \langle -1, -8 \rangle$
 $\mathbf{v} = \langle 1, -9 \rangle$

- A) 162.35° B) 104.62°
C) 9.46° D) 13.47°

116) $\mathbf{u} = \langle -9, 8 \rangle$
 $\mathbf{v} = \langle 5, 5 \rangle$

- A) 32.42° B) 112.17°
C) 82.87° D) 93.37°

117) $\mathbf{u} = \langle -7, 6 \rangle$
 $\mathbf{v} = \langle -4, -6 \rangle$

- A) 96.91° B) 105.26°
C) 127.3° D) 10.86°

118) $\mathbf{u} = \langle -4, -8 \rangle$
 $\mathbf{v} = \langle -3, 1 \rangle$

- A) 124.78° B) 170.07°
C) 81.87° D) 153.43°

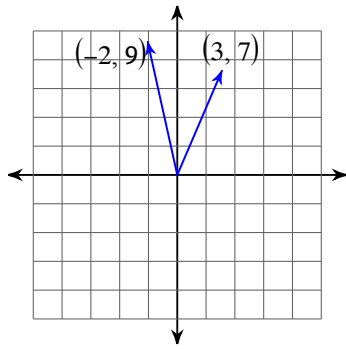
119) $\mathbf{u} = \langle 8, 8 \rangle$
 $\mathbf{v} = \langle 2, 7 \rangle$

- A) 71.57° B) 11.31°
C) 29.05° D) 123.08°

120) $\mathbf{u} = \langle 9, 2 \rangle$
 $\mathbf{v} = \langle 1, -3 \rangle$

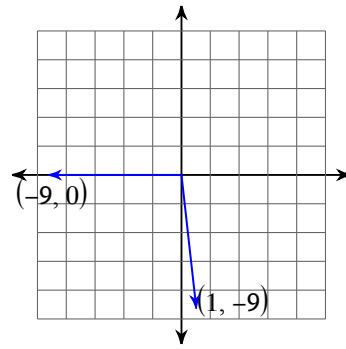
- A) 122.47° B) 112.75°
C) 99.46° D) 84.09°

121)



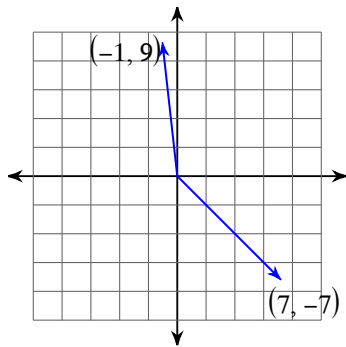
- A) 160.56° B) 71.57°
 C) 3.18° D) 35.73°

122)



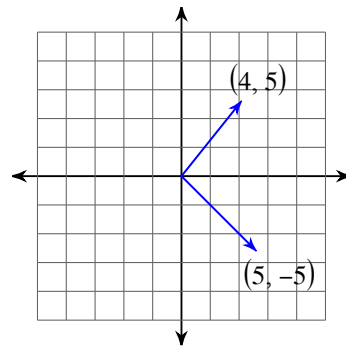
- A) 96.34° B) 123.69°
 C) 21.16° D) 36.87°

123)



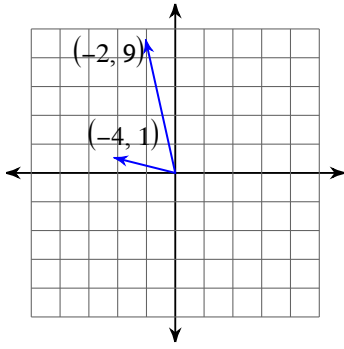
- A) 59.04° B) 180°
 C) 141.34° D) 17.32°

124)



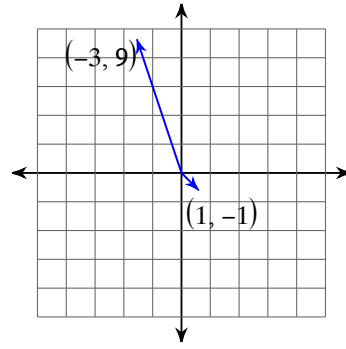
- A) 45° B) 136.91°
 C) 96.34° D) 50.09°

125)



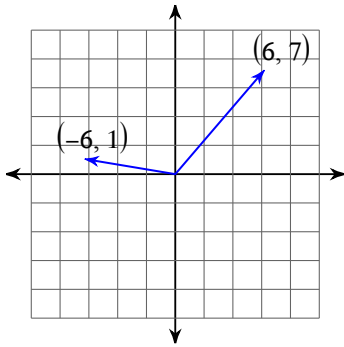
- A) 35.36° B) 63.43°
 C) 156.61° D) 71.13°

126)



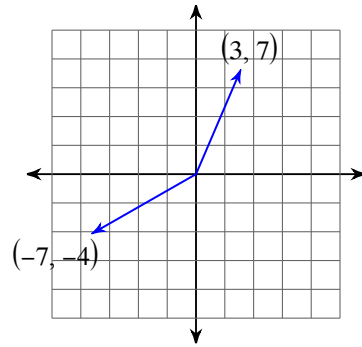
- A) 153.43° B) 177.74°
 C) 35.54° D) 23.96°

127)



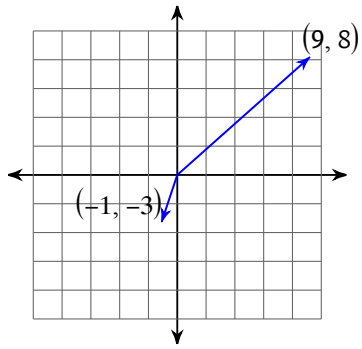
- A) 104.04° B) 54.73°
 C) 121.14° D) 119.05°

128)



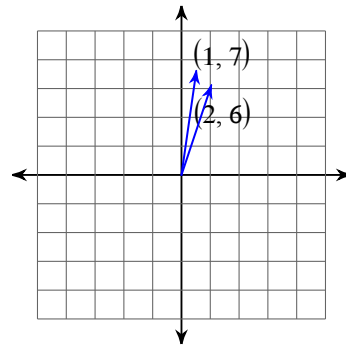
- A) 142.94° B) 116.57°
 C) 155.12° D) 144.46°

129)



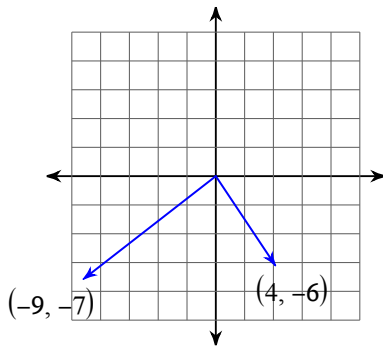
- A) 150.07° B) 163.93°
 C) 135° D) 177.51°

130)



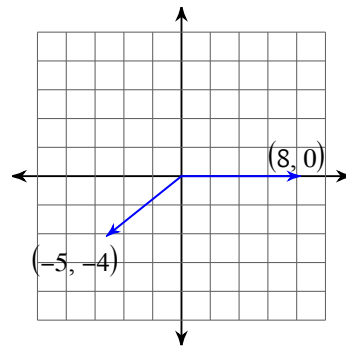
- A) 120.75° B) 10.3°
 C) 117.9° D) 135°

131)



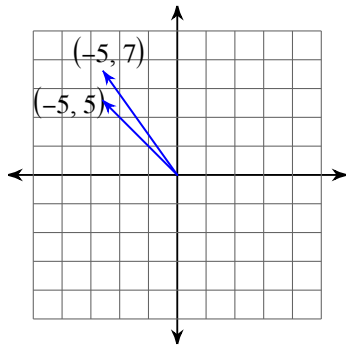
- A) 68.84° B) 174.35°
 C) 21.04° D) 85.82°

132)



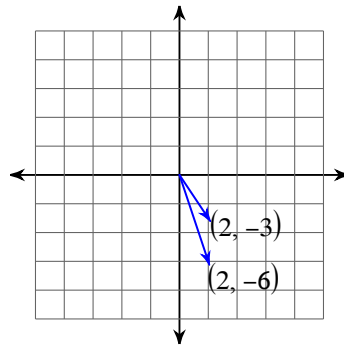
- A) 141.34° B) 66.8°
 C) 180° D) 81.87°

133)



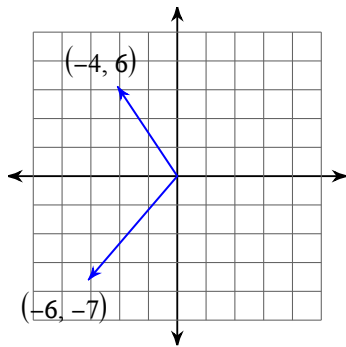
- A) 9.46° B) 135°
 C) 142.13° D) 140.53°

134)



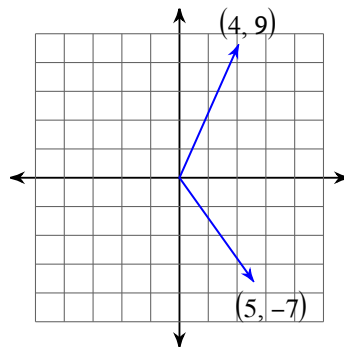
- A) 11.31° B) 107.65°
 C) 35.54° D) 15.26°

135)



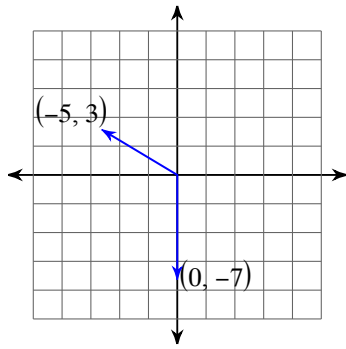
- A) 111.16° B) 117.6°
 C) 105.84° D) 105.71°

136)



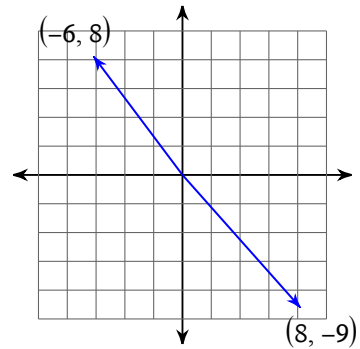
- A) 141.91° B) 159.44°
 C) 120.5° D) 147.32°

137)



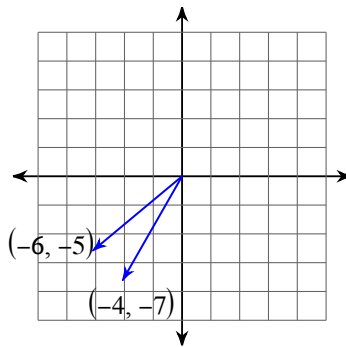
- A) 180° B) 149.47°
 C) 120.96° D) 157.54°

138)



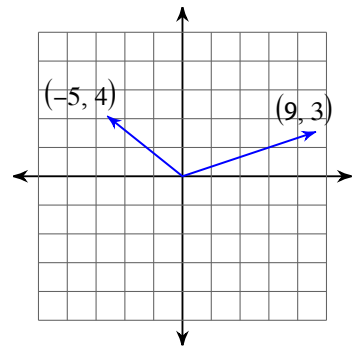
- A) 97.7° B) 29.74°
 C) 175.24° D) 95.44°

139)



- A) 20.45° B) 116.57°
 C) 53.13° D) 157.83°

140)



- A) 112.62° B) 122.91°
 C) 158.84° D) 79.7°

Assignment

Date _____ Period _____

Find the component form of the resultant vector.

1) $\mathbf{a} = \langle -11, -4 \rangle$

$\mathbf{g} = \langle 12, -7 \rangle$

Find: $-\mathbf{a} + \mathbf{g}$

- A) $\langle 14, -1 \rangle$ B) $\langle 16, -15 \rangle$
 C) $\langle 9, -17 \rangle$ *D) $\langle 23, -3 \rangle$

2) $\mathbf{u} = \langle -3, 4 \rangle$

$\mathbf{b} = \langle 2, -3 \rangle$

Find: $\mathbf{u} + \mathbf{b}$

- A) $\langle 5, -4 \rangle$ B) $\langle -1, -6 \rangle$
 *C) $\langle -1, 1 \rangle$ D) $\langle -5, 1 \rangle$

3) $\mathbf{u} = \langle -6, -10 \rangle$

$\mathbf{g} = \langle 2, -1 \rangle$

Find: $-\mathbf{u} + \mathbf{g}$

- A) $\langle -3, -2 \rangle$ B) $\langle -2, 18 \rangle$
 *C) $\langle 8, 9 \rangle$ D) $\langle 9, -12 \rangle$

4) $\mathbf{f} = \langle -7, 4 \rangle$

$\mathbf{g} = \langle 9, 1 \rangle$

Find: $-\mathbf{f} + \mathbf{g}$

- *A) $\langle 16, -3 \rangle$ B) $\langle 21, -6 \rangle$
 C) $\langle -15, -2 \rangle$ D) $\langle -3, -17 \rangle$

5) $\mathbf{u} = \langle -1, -12 \rangle$

$\mathbf{g} = \langle -5, 9 \rangle$

Find: $\mathbf{u} + \mathbf{g}$

- *A) $\langle -6, -3 \rangle$ B) $\langle -9, -6 \rangle$
 C) $\langle -13, -4 \rangle$ D) $\langle -2, -18 \rangle$

6) $\mathbf{u} = \langle -4, 12 \rangle$

$\mathbf{g} = \langle 10, -4 \rangle$

Find: $\mathbf{u} + \mathbf{g}$

- A) $\langle -4, 0 \rangle$ B) $\langle 16, -4 \rangle$
 C) $\langle -13, -9 \rangle$ *D) $\langle 6, 8 \rangle$

7) $\mathbf{f} = \langle -2, 9 \rangle$

$\mathbf{v} = \langle -11, -5 \rangle$

Find: $\mathbf{f} + \mathbf{v}$

- A) $\langle 19, -8 \rangle$ *B) $\langle -13, 4 \rangle$
 C) $\langle 2, 3 \rangle$ D) $\langle 1, -7 \rangle$

8) $\mathbf{u} = \langle -7, 2 \rangle$

$\mathbf{g} = \langle -8, -7 \rangle$

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

- A) $\langle 5, 10 \rangle$ B) $\langle -13, 4 \rangle$
 *C) $\langle 1, 9 \rangle$ D) $\langle 2, 7 \rangle$

9) $\mathbf{a} = \langle 12, -12 \rangle$

$\mathbf{g} = \langle 4, -6 \rangle$

Find: $\mathbf{a} + \mathbf{g}$

- *A) $\langle 16, -18 \rangle$ B) $\langle 6, -20 \rangle$
C) $\langle -11, 9 \rangle$ D) $\langle 16, -2 \rangle$

10) $\mathbf{f} = \langle 8, -5 \rangle$

$\mathbf{v} = \langle 5, 8 \rangle$

Find: $-\mathbf{f} - \mathbf{v}$

- A) $\langle 16, 10 \rangle$ B) $\langle 18, -8 \rangle$
C) $\langle 2, 16 \rangle$ *D) $\langle -13, -3 \rangle$

11) $\mathbf{u} = \langle 10, -2 \rangle$

$\mathbf{v} = \langle 9, -10 \rangle$

Find: $-\mathbf{u} + \mathbf{v}$

- *A) $\langle -1, -8 \rangle$ B) $\langle 3, 7 \rangle$
C) $\langle 1, -2 \rangle$ D) $\langle -13, -6 \rangle$

12) $\mathbf{f} = \langle 11, -5 \rangle$

$\mathbf{g} = \langle -4, -8 \rangle$

Find: $\mathbf{f} - \mathbf{g}$

- *A) $\langle 15, 3 \rangle$ B) $\langle 6, 4 \rangle$
C) $\langle -11, 23 \rangle$ D) $\langle 2, 17 \rangle$

13) $\mathbf{f} = \langle 5, 4 \rangle$

$\mathbf{g} = \langle 4, -6 \rangle$

Find: $-\mathbf{f} - \mathbf{g}$

- *A) $\langle -9, 2 \rangle$ B) $\langle 5, 11 \rangle$
C) $\langle 7, -3 \rangle$ D) $\langle -7, -3 \rangle$

14) $\mathbf{u} = \langle 0, 8 \rangle$

$\mathbf{v} = \langle -12, -10 \rangle$

Find: $\mathbf{u} - \mathbf{v}$

- A) $\langle 0, -13 \rangle$ *B) $\langle 12, 18 \rangle$
C) $\langle 1, 21 \rangle$ D) $\langle -1, -1 \rangle$

15) $\mathbf{f} = \langle 9, -10 \rangle$

$\mathbf{v} = \langle -2, 3 \rangle$

Find: $-\mathbf{f} + \mathbf{v}$

- A) $\langle 1, -13 \rangle$ *B) $\langle -11, 13 \rangle$
C) $\langle 8, 4 \rangle$ D) $\langle -9, -8 \rangle$

16) $\mathbf{u} = \langle 5, -8 \rangle$

$\mathbf{g} = \langle 2, 12 \rangle$

Find: $\mathbf{u} + \mathbf{g}$

- A) $\langle 13, 0 \rangle$ B) $\langle 23, -13 \rangle$
*C) $\langle 7, 4 \rangle$ D) $\langle -19, 9 \rangle$

17) $\mathbf{f} = \langle -9, -2 \rangle$

$\mathbf{g} = \langle 11, 8 \rangle$

Find: $\mathbf{f} - \mathbf{g}$

- A) $\langle -14, 0 \rangle$ B) $\langle -3, 11 \rangle$
*C) $\langle -20, -10 \rangle$ D) $\langle -20, 1 \rangle$

18) $\mathbf{f} = \langle 10, 0 \rangle$

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

Find: $\mathbf{f} - \mathbf{g}$

- A) $\langle 5, 10 \rangle$ B) $\langle 9, 12 \rangle$
*C) $\langle 5, 3 \rangle$ D) $\langle -9, -6 \rangle$

19) $\mathbf{f} = \langle -11, 0 \rangle$

$\mathbf{v} = \langle 6, 11 \rangle$

Find: $\mathbf{f} + \mathbf{v}$

*A) $\langle -5, 11 \rangle$

B) $\langle -10, 2 \rangle$

C) $\langle -4, -5 \rangle$

D) $\langle 17, -3 \rangle$

20) $\mathbf{a} = \langle 7, -11 \rangle$

$\mathbf{g} = \langle 11, 5 \rangle$

Find: $\mathbf{a} - \mathbf{g}$

A) $\langle -9, 8 \rangle$

*B) $\langle -4, -16 \rangle$

C) $\langle 15, -8 \rangle$

D) $\langle -7, 0 \rangle$

Find the magnitude and direction angle of the resultant vector.

21) $\mathbf{u} = \langle 10, -4 \rangle$

$\mathbf{v} = \langle -6, 8 \rangle$

Find: $-\mathbf{u} - \mathbf{v}$

A) 10; 53.13°

B) $2\sqrt{73} \approx 17.088$; 290.56°

*C) $4\sqrt{2} \approx 5.657$; 225°

D) $2\sqrt{61} \approx 15.62$; 140.19°

22) $\mathbf{f} = \langle 2, 8 \rangle$

$\mathbf{g} = \langle 12, 0 \rangle$

Find: $\mathbf{f} - \mathbf{g}$

A) $\sqrt{613} \approx 24.759$; 43.36°

B) $4\sqrt{2} \approx 5.657$; 315°

*C) $2\sqrt{41} \approx 12.806$; 141.34°

D) $\sqrt{181} \approx 13.454$; 228.01°

23) $\mathbf{f} = \langle -4, -6 \rangle$

$\mathbf{b} = \langle 3, 4 \rangle$

Find: $-\mathbf{f} - \mathbf{b}$

A) $\sqrt{137} \approx 11.705$; 160.02°

B) $2\sqrt{13} \approx 7.211$; 33.69°

C) $\sqrt{226} \approx 15.033$; 266.19°

*D) $\sqrt{5} \approx 2.236$; 63.43°

24) $\mathbf{f} = \langle 12, -2 \rangle$

$\mathbf{g} = \langle -1, 7 \rangle$

Find: $-\mathbf{f} + \mathbf{g}$

A) $\sqrt{485} \approx 22.023$; 39.47°

*B) $5\sqrt{10} \approx 15.811$; 145.3°

C) $6\sqrt{2} \approx 8.485$; 45°

D) $\sqrt{265} \approx 16.279$; 132.51°

25) $\mathbf{u} = \langle -11, 9 \rangle$

$\mathbf{v} = \langle 12, -9 \rangle$

Find: $\mathbf{u} + \mathbf{v}$

A) $3\sqrt{34} \approx 17.493$; 329.04°

B) $\sqrt{185} \approx 13.601$; 17.1°

C) $4\sqrt{13} \approx 14.422$; 123.69°

*D) 1; 0°

26) $\mathbf{f} = \langle 6, 0 \rangle$

$\mathbf{b} = \langle 10, 12 \rangle$

Find: $-\mathbf{f} + \mathbf{b}$

A) $3\sqrt{13} \approx 10.817$; 56.31°

B) $\sqrt{41} \approx 6.403$; 308.66°

C) $\sqrt{181} \approx 13.454$; 138.01°

*D) $4\sqrt{10} \approx 12.649$; 71.57°

27) $\mathbf{u} = \langle -1, -10 \rangle$

$\mathbf{v} = \langle -5, -4 \rangle$

Find: $-\mathbf{u} + \mathbf{v}$

- A) $\sqrt{274} \approx 16.553; 115.02^\circ$
 B) $5\sqrt{10} \approx 15.811; 34.7^\circ$
 C) $\sqrt{197} \approx 14.036; 184.09^\circ$
 *D) $2\sqrt{13} \approx 7.211; 123.69^\circ$

28) $\mathbf{u} = \langle -7, 5 \rangle$

$\mathbf{g} = \langle -4, 1 \rangle$

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

- A) $1; 0^\circ$
 *B) $\sqrt{157} \approx 12.53; 331.39^\circ$
 C) $\sqrt{82} \approx 9.055; 83.66^\circ$
 D) $3\sqrt{13} \approx 10.817; 33.69^\circ$

29) $\mathbf{f} = \langle -7, 7 \rangle$

$\mathbf{v} = \langle 5, 8 \rangle$

Find: $-\mathbf{f} + \mathbf{v}$

- *A) $\sqrt{145} \approx 12.042; 4.76^\circ$
 B) $2\sqrt{29} \approx 10.77; 338.2^\circ$
 C) $4; 90^\circ$
 D) $2\sqrt{41} \approx 12.806; 51.34^\circ$

30) $\mathbf{u} = \langle 3, 7 \rangle$

$\mathbf{v} = \langle -5, 10 \rangle$

Find: $\mathbf{u} + \mathbf{v}$

- A) $2\sqrt{146} \approx 24.166; 294.44^\circ$
 B) $\sqrt{53} \approx 7.28; 74.05^\circ$
 *C) $\sqrt{293} \approx 17.117; 96.71^\circ$
 D) $3\sqrt{5} \approx 6.708; 63.43^\circ$

31) $\mathbf{u} = \langle 5, 4 \rangle$

$\mathbf{g} = \langle -6, 1 \rangle$

Find: $\mathbf{u} + \mathbf{g}$

- *A) $\sqrt{26} \approx 5.099; 101.31^\circ$
 B) $2; 0^\circ$
 C) $\sqrt{82} \approx 9.055; 6.34^\circ$
 D) $2\sqrt{58} \approx 15.232; 113.2^\circ$

32) $\mathbf{f} = \langle 12, -11 \rangle$

$\mathbf{v} = \langle 1, 2 \rangle$

Find: $\mathbf{f} + \mathbf{v}$

- A) $\sqrt{5} \approx 2.236; 26.57^\circ$
 B) $\sqrt{29} \approx 5.385; 338.2^\circ$
 *C) $5\sqrt{10} \approx 15.811; 325.3^\circ$
 D) $\sqrt{130} \approx 11.402; 105.26^\circ$

33) $\mathbf{u} = \langle -8, -4 \rangle$

$\mathbf{g} = \langle -11, 6 \rangle$

Find: $-\mathbf{u} + \mathbf{g}$

- A) $\sqrt{10} \approx 3.162; 108.43^\circ$
 B) $\sqrt{610} \approx 24.698; 148.24^\circ$
 C) $2\sqrt{5} \approx 4.472; 296.57^\circ$
 *D) $\sqrt{109} \approx 10.44; 106.7^\circ$

34) $\mathbf{u} = \langle 7, 11 \rangle$

$\mathbf{v} = \langle 2, 5 \rangle$

Find: $-\mathbf{u} - \mathbf{v}$

- A) $\sqrt{53} \approx 7.28; 164.05^\circ$
 B) $\sqrt{202} \approx 14.213; 39.29^\circ$
 C) $\sqrt{274} \approx 16.553; 205.02^\circ$
 *D) $\sqrt{337} \approx 18.358; 240.64^\circ$

35) $\mathbf{u} = \langle -1, 6 \rangle$
 $\mathbf{v} = \langle -7, -8 \rangle$
 Find: $\mathbf{u} + \mathbf{v}$

- A) $4\sqrt{2} \approx 5.657; 225^\circ$
 B) $\sqrt{85} \approx 9.22; 102.53^\circ$
 *C) $2\sqrt{17} \approx 8.246; 194.04^\circ$
 D) $15\sqrt{2} \approx 21.213; 135^\circ$

36) $\mathbf{f} = \langle 12, 6 \rangle$
 $\mathbf{v} = \langle 2, -3 \rangle$
 Find: $\mathbf{f} + \mathbf{v}$

- A) $5\sqrt{13} \approx 18.028; 3.18^\circ$
 *B) $\sqrt{205} \approx 14.318; 12.09^\circ$
 C) $\sqrt{466} \approx 21.587; 283.39^\circ$
 D) $3\sqrt{2} \approx 4.243; 315^\circ$

37) $\mathbf{u} = \langle 0, -12 \rangle$
 $\mathbf{b} = \langle 2, 12 \rangle$
 Find: $\mathbf{u} + \mathbf{b}$

- *A) $2; 0^\circ$
 B) $5\sqrt{10} \approx 15.811; 325.3^\circ$
 C) $\sqrt{106} \approx 10.296; 299.05^\circ$
 D) $2\sqrt{17} \approx 8.246; 165.96^\circ$

38) $\mathbf{u} = \langle 2, 3 \rangle$
 $\mathbf{g} = \langle 11, 2 \rangle$
 Find: $\mathbf{u} + \mathbf{g}$

- A) $14; 0^\circ$
 B) $\sqrt{185} \approx 13.601; 233.97^\circ$
 C) $\sqrt{290} \approx 17.029; 266.63^\circ$
 *D) $\sqrt{194} \approx 13.928; 21.04^\circ$

39) $\mathbf{u} = \langle -4, -12 \rangle$
 $\mathbf{g} = \langle 4, -10 \rangle$
 Find: $-\mathbf{u} + \mathbf{g}$

- A) $3\sqrt{26} \approx 15.297; 281.31^\circ$
 B) $\sqrt{97} \approx 9.849; 113.96^\circ$
 C) $\sqrt{293} \approx 17.117; 96.71^\circ$
 *D) $2\sqrt{17} \approx 8.246; 14.04^\circ$

40) $\mathbf{f} = \langle 5, 1 \rangle$
 $\mathbf{v} = \langle -10, -3 \rangle$
 Find: $\mathbf{f} + \mathbf{v}$

- *A) $\sqrt{29} \approx 5.385; 201.8^\circ$
 B) $2\sqrt{130} \approx 22.804; 52.13^\circ$
 C) $18; 270^\circ$
 D) $\sqrt{410} \approx 20.248; 122.91^\circ$

Find the component form of the resultant vector.

41) $\mathbf{a} = \langle -2, -4 \rangle$
 Unit vector in the opposite direction of \mathbf{a}

- A) $\left\langle -\frac{3}{5}, \frac{4}{5} \right\rangle$ B) $\left\langle \frac{20}{29}, -\frac{21}{29} \right\rangle$
 *C) $\left\langle \frac{\sqrt{5}}{5}, \frac{2\sqrt{5}}{5} \right\rangle$ D) $\left\langle \frac{\sqrt{65}}{65}, -\frac{8\sqrt{65}}{65} \right\rangle$

42) $\mathbf{u} = \langle -16, 30 \rangle$
 Unit vector in the opposite direction of \mathbf{u}

- A) $\left\langle \frac{5}{13}, \frac{12}{13} \right\rangle$ *B) $\left\langle \frac{8}{17}, -\frac{15}{17} \right\rangle$
 C) $\left\langle -\frac{3}{5}, \frac{4}{5} \right\rangle$ D) $\left\langle -\frac{\sqrt{5}}{5}, \frac{2\sqrt{5}}{5} \right\rangle$

43) $\mathbf{u} = \langle 16, -2\sqrt{161} \rangle$

Unit vector in the direction of \mathbf{u}

- A) $\left\langle \frac{5\sqrt{29}}{29}, \frac{2\sqrt{29}}{29} \right\rangle$
 B) $\langle -1, 0 \rangle$
 *C) $\left\langle \frac{8}{15}, -\frac{\sqrt{161}}{15} \right\rangle$
 D) $\left\langle \frac{7\sqrt{2}}{10}, \frac{\sqrt{2}}{10} \right\rangle$

44) $\mathbf{f} = \langle 12, 9 \rangle$

Unit vector in the direction of \mathbf{f}

- *A) $\left\langle \frac{4}{5}, \frac{3}{5} \right\rangle$
 B) $\left\langle \frac{5\sqrt{29}}{29}, -\frac{2\sqrt{29}}{29} \right\rangle$
 C) $\left\langle -\frac{\sqrt{2}}{2}, \frac{\sqrt{2}}{2} \right\rangle$
 D) $\left\langle \frac{\sqrt{323}}{18}, -\frac{1}{18} \right\rangle$

45) $\mathbf{u} = \langle 7, 24 \rangle$

Unit vector in the opposite direction of \mathbf{u}

- *A) $\left\langle -\frac{7}{25}, -\frac{24}{25} \right\rangle$
 B) $\left\langle \frac{20}{29}, -\frac{21}{29} \right\rangle$
 C) $\left\langle -\frac{5\sqrt{34}}{34}, -\frac{3\sqrt{34}}{34} \right\rangle$
 D) $\left\langle \frac{\sqrt{2}}{2}, \frac{\sqrt{2}}{2} \right\rangle$

46) $\mathbf{f} = \langle 2, -12 \rangle$

Unit vector in the direction of \mathbf{f}

- A) $\left\langle \frac{4\sqrt{97}}{97}, \frac{9\sqrt{97}}{97} \right\rangle$
 *B) $\left\langle \frac{\sqrt{37}}{37}, -\frac{6\sqrt{37}}{37} \right\rangle$
 C) $\left\langle \frac{\sqrt{2}}{2}, \frac{\sqrt{2}}{2} \right\rangle$
 D) $\left\langle \frac{\sqrt{143}}{12}, -\frac{1}{12} \right\rangle$

47) $\mathbf{u} = \langle 8, -2 \rangle$

Unit vector in the direction of \mathbf{u}

- A) $\left\langle \frac{5\sqrt{146}}{146}, -\frac{11\sqrt{146}}{146} \right\rangle$
 B) $\left\langle \frac{12}{37}, -\frac{35}{37} \right\rangle$
 C) $\left\langle \frac{7}{25}, \frac{24}{25} \right\rangle$
 *D) $\left\langle \frac{4\sqrt{17}}{17}, -\frac{\sqrt{17}}{17} \right\rangle$

48) $\mathbf{u} = \langle 16, -30 \rangle$

Unit vector in the opposite direction of \mathbf{u}

- A) $\left\langle -\frac{11\sqrt{146}}{146}, -\frac{5\sqrt{146}}{146} \right\rangle$
 *B) $\left\langle -\frac{8}{17}, \frac{15}{17} \right\rangle$
 C) $\left\langle -\frac{3\sqrt{58}}{58}, -\frac{7\sqrt{58}}{58} \right\rangle$
 D) $\left\langle \frac{\sqrt{5}}{5}, -\frac{2\sqrt{5}}{5} \right\rangle$

49) $\mathbf{f} = \langle -10, 9 \rangle$

Unit vector in the opposite direction of \mathbf{f}

A) $\left\langle -\frac{9\sqrt{85}}{85}, -\frac{2\sqrt{85}}{85} \right\rangle$

B) $\left\langle \frac{5}{13}, \frac{12}{13} \right\rangle$

C) $\left\langle \frac{3\sqrt{2}}{5}, \frac{\sqrt{7}}{5} \right\rangle$

*D) $\left\langle \frac{10\sqrt{181}}{181}, -\frac{9\sqrt{181}}{181} \right\rangle$

50) $\mathbf{u} = \langle 16, 30 \rangle$

Unit vector in the direction of \mathbf{u}

A) $\left\langle \frac{9}{41}, \frac{40}{41} \right\rangle$

B) $\left\langle \frac{2\sqrt{29}}{29}, \frac{5\sqrt{29}}{29} \right\rangle$

C) $\left\langle \frac{3}{5}, \frac{4}{5} \right\rangle$

*D) $\left\langle \frac{8}{17}, \frac{15}{17} \right\rangle$

51) $\mathbf{u} = \langle -12, -\sqrt{481} \rangle$

Unit vector in the direction of \mathbf{u}

*A) $\left\langle -\frac{12}{25}, -\frac{\sqrt{481}}{25} \right\rangle$

B) $\left\langle \frac{8\sqrt{145}}{145}, -\frac{9\sqrt{145}}{145} \right\rangle$

C) $\langle 1, 0 \rangle$

D) $\left\langle -\frac{5\sqrt{106}}{106}, -\frac{9\sqrt{106}}{106} \right\rangle$

52) $\mathbf{f} = \langle -20, 21 \rangle$

Unit vector in the opposite direction of \mathbf{f}

A) $\left\langle -\frac{8}{17}, \frac{15}{17} \right\rangle$

B) $\left\langle \frac{9}{41}, \frac{40}{41} \right\rangle$

*C) $\left\langle \frac{20}{29}, -\frac{21}{29} \right\rangle$

D) $\left\langle \frac{\sqrt{145}}{17}, \frac{12}{17} \right\rangle$

53) $\mathbf{f} = \langle 15, 36 \rangle$

Unit vector in the opposite direction of \mathbf{f}

*A) $\left\langle -\frac{5}{13}, -\frac{12}{13} \right\rangle$

B) $\left\langle \frac{7\sqrt{2}}{10}, -\frac{\sqrt{2}}{10} \right\rangle$

C) $\left\langle \frac{2\sqrt{3}}{9}, -\frac{\sqrt{69}}{9} \right\rangle$

D) $\left\langle \frac{8\sqrt{145}}{145}, -\frac{9\sqrt{145}}{145} \right\rangle$

54) $\mathbf{f} = \langle 12, -35 \rangle$

Unit vector in the opposite direction of \mathbf{f}

A) $\left\langle \frac{\sqrt{7}}{4}, \frac{3}{4} \right\rangle$

B) $\left\langle -\frac{9}{29}, \frac{2\sqrt{190}}{29} \right\rangle$

*C) $\left\langle -\frac{12}{37}, \frac{35}{37} \right\rangle$

D) $\left\langle \frac{11\sqrt{137}}{137}, \frac{4\sqrt{137}}{137} \right\rangle$

55) $\mathbf{u} = \langle 8, -9 \rangle$

Unit vector in the opposite direction of \mathbf{u}

- A) $\left\langle -\frac{\sqrt{145}}{145}, -\frac{12\sqrt{145}}{145} \right\rangle$
 *B) $\left\langle -\frac{8\sqrt{145}}{145}, \frac{9\sqrt{145}}{145} \right\rangle$
 C) $\left\langle \frac{3}{5}, \frac{4}{5} \right\rangle$
 D) $\left\langle -\frac{20}{29}, -\frac{21}{29} \right\rangle$

56) $\mathbf{u} = \langle 15, 20 \rangle$

Unit vector in the direction of \mathbf{u}

- *A) $\left\langle \frac{3}{5}, \frac{4}{5} \right\rangle$
 B) $\left\langle \frac{8}{17}, \frac{15}{17} \right\rangle$
 C) $\left\langle \frac{9\sqrt{145}}{145}, -\frac{8\sqrt{145}}{145} \right\rangle$
 D) $\left\langle \frac{2}{3}, -\frac{\sqrt{5}}{3} \right\rangle$

57) $\mathbf{f} = \langle 29, -2\sqrt{30} \rangle$

Unit vector in the direction of \mathbf{f}

- A) $\langle -1, 0 \rangle$
 *B) $\left\langle \frac{29}{31}, -\frac{2\sqrt{30}}{31} \right\rangle$
 C) $\left\langle -\frac{2\sqrt{13}}{13}, \frac{3\sqrt{13}}{13} \right\rangle$
 D) $\left\langle \frac{5}{13}, \frac{12}{13} \right\rangle$

58) $\mathbf{f} = \langle -12, 12 \rangle$

Unit vector in the direction of \mathbf{f}

- A) $\left\langle -\frac{4}{5}, -\frac{3}{5} \right\rangle$
 B) $\left\langle \frac{2\sqrt{5}}{5}, \frac{\sqrt{5}}{5} \right\rangle$
 *C) $\left\langle -\frac{\sqrt{2}}{2}, \frac{\sqrt{2}}{2} \right\rangle$
 D) $\left\langle \frac{3}{5}, \frac{4}{5} \right\rangle$

59) $\mathbf{u} = \langle 10, 24 \rangle$

Unit vector in the opposite direction of \mathbf{u}

- A) $\left\langle \frac{8\sqrt{73}}{73}, -\frac{3\sqrt{73}}{73} \right\rangle$
 B) $\left\langle -\frac{7\sqrt{113}}{113}, -\frac{8\sqrt{113}}{113} \right\rangle$
 C) $\left\langle -\frac{2\sqrt{53}}{53}, -\frac{7\sqrt{53}}{53} \right\rangle$
 *D) $\left\langle -\frac{5}{13}, -\frac{12}{13} \right\rangle$

60) $\mathbf{u} = \langle 12, 35 \rangle$

Unit vector in the opposite direction of \mathbf{u}

- *A) $\left\langle -\frac{12}{37}, -\frac{35}{37} \right\rangle$
 B) $\left\langle \frac{3\sqrt{10}}{10}, -\frac{\sqrt{10}}{10} \right\rangle$
 C) $\left\langle \frac{8\sqrt{113}}{113}, -\frac{7\sqrt{113}}{113} \right\rangle$
 D) $\left\langle \frac{9}{41}, \frac{40}{41} \right\rangle$

Find the dot product of the given vectors.

61) $\mathbf{u} = \langle 1, 2 \rangle$
 $\mathbf{v} = \langle 0, -2 \rangle$

- A) 21 B) -88
C) -64 *D) -4

62) $\mathbf{u} = \langle 6, 5 \rangle$
 $\mathbf{v} = \langle -8, 3 \rangle$

- *A) -33 B) 63
C) 55 D) 30

63) $\mathbf{u} = \langle -7, -5 \rangle$
 $\mathbf{v} = \langle 7, -7 \rangle$

- A) 64 B) -16
C) 22 *D) -14

64) $\mathbf{u} = \langle 4, -7 \rangle$
 $\mathbf{v} = \langle 8, -3 \rangle$

- A) -56 B) 42
C) -2 *D) 53

65) $\mathbf{u} = \langle 4, 2 \rangle$
 $\mathbf{v} = \langle 0, -1 \rangle$

- A) -48 B) -44
C) 36 *D) -2

66) $\mathbf{u} = \langle 9, 1 \rangle$
 $\mathbf{v} = \langle -2, -3 \rangle$

- A) 37 B) -24
C) -47 *D) -21

67) $\mathbf{u} = \langle 9, -6 \rangle$
 $\mathbf{v} = \langle 9, -8 \rangle$

- *A) 129 B) 15
C) -60 D) -31

68) $\mathbf{u} = \langle -3, 5 \rangle$
 $\mathbf{v} = \langle 0, 6 \rangle$

- A) 26 B) -26
*C) 30 D) -34

69) $\mathbf{u} = \langle -9, 5 \rangle$
 $\mathbf{v} = \langle -2, -6 \rangle$

- *A) -12 B) 30
C) -31 D) 21

70) $\mathbf{u} = \langle -8, -6 \rangle$
 $\mathbf{v} = \langle -9, 0 \rangle$

- *A) 72 B) 81
C) -114 D) 6

71) $\mathbf{u} = \langle -6, 8 \rangle$
 $\mathbf{v} = \langle -7, 5 \rangle$

- *A) 82 B) 14
C) -27 D) -20

72) $\mathbf{u} = \langle -4, -1 \rangle$
 $\mathbf{v} = \langle 8, -9 \rangle$

- A) -63 B) -78
C) -31 *D) -23

73) $\mathbf{u} = \langle 0, 7 \rangle$
 $\mathbf{v} = \langle 7, 5 \rangle$

- A) -64 B) 12
 *C) 35 D) 69

74) $\mathbf{u} = \langle -2, 7 \rangle$
 $\mathbf{v} = \langle 4, 2 \rangle$

- A) -19 *B) 6
 C) 84 D) 25

75) $\mathbf{u} = \langle -4, 5 \rangle$
 $\mathbf{v} = \langle -5, -1 \rangle$

- *A) 15 B) 78
 C) 43 D) -67

76) $\mathbf{u} = \langle -1, -3 \rangle$
 $\mathbf{v} = \langle 7, 5 \rangle$

- *A) -22 B) 47
 C) 0 D) -34

77) $\mathbf{u} = \langle 7, -6 \rangle$
 $\mathbf{v} = \langle 5, -7 \rangle$

- A) 24 B) 104
 *C) 77 D) -33

78) $\mathbf{u} = \langle 5, 5 \rangle$
 $\mathbf{v} = \langle 3, 8 \rangle$

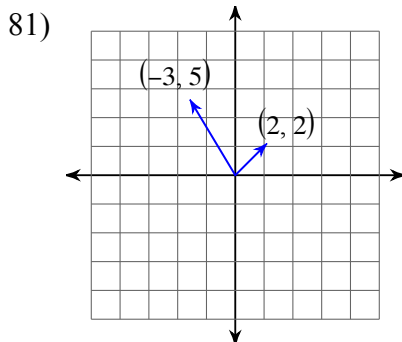
- A) -56 *B) 55
 C) 81 D) 2

79) $\mathbf{u} = \langle -4, -8 \rangle$
 $\mathbf{v} = \langle 3, 7 \rangle$

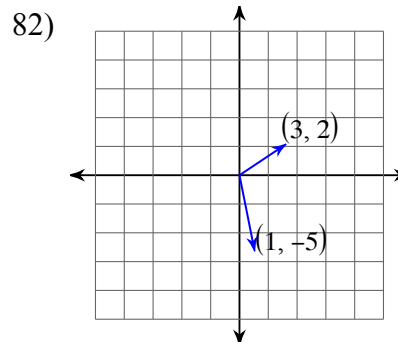
- A) 4 *B) -68
 C) 49 D) 20

80) $\mathbf{u} = \langle -4, -3 \rangle$
 $\mathbf{v} = \langle 3, 1 \rangle$

- *A) -15 B) 5
 C) 16 D) 25

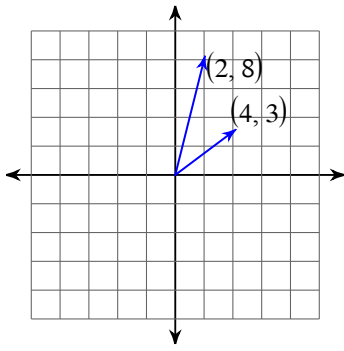


- A) -16 B) 14
 C) -3 *D) 4



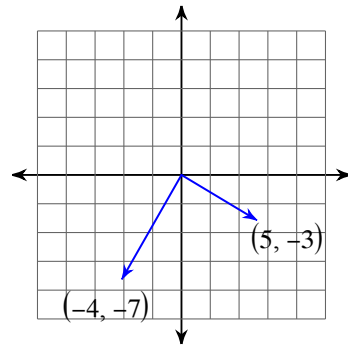
- A) -32 *B) -7
 C) 65 D) -4

83)



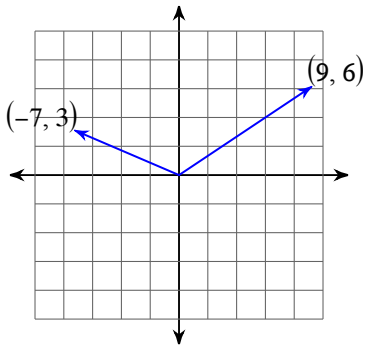
- A) 42 B) -63
C) 21 *D) 32

84)



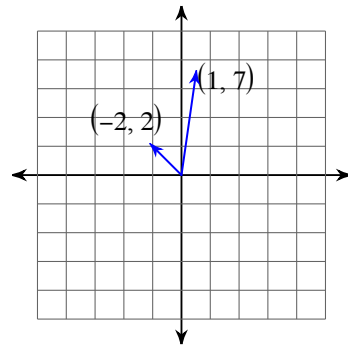
- A) -54 B) 0
*C) 1 D) -46

85)



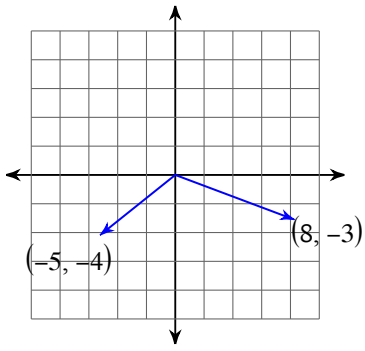
- *A) -45 B) -22
C) -55 D) 42

86)



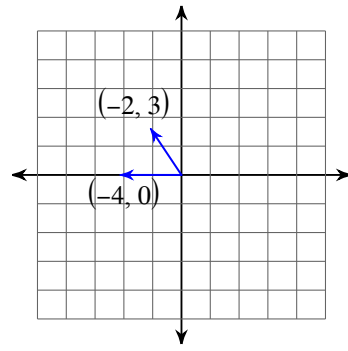
- A) -3 B) 35
*C) 12 D) -10

87)



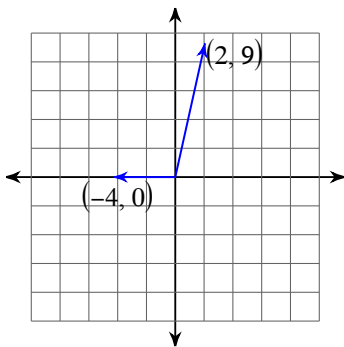
- A) -32 *B) -28
 C) -10 D) -20

88)



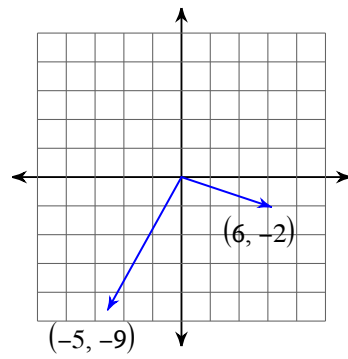
- *A) 8 B) 6
 C) 37 D) -78

89)



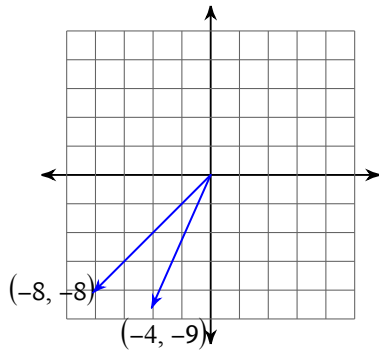
- *A) -8 B) 8
 C) 32 D) -14

90)



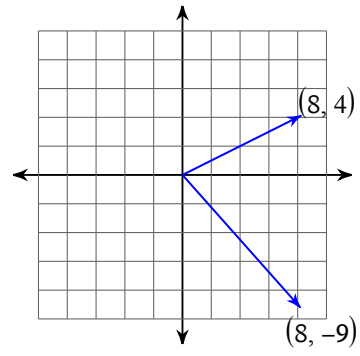
- A) -19 *B) -12
 C) -24 D) 34

91)



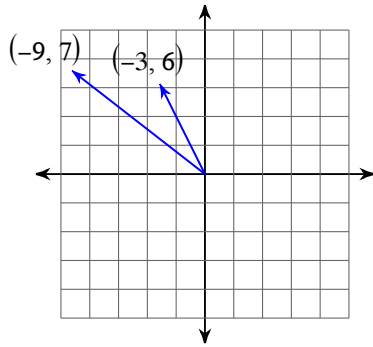
- A) -54 B) 24
 *C) 104 D) -6

92)



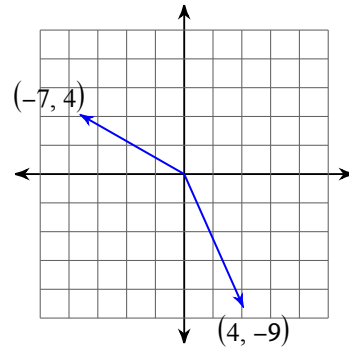
- *A) 28 B) 8
 C) -6 D) 55

93)

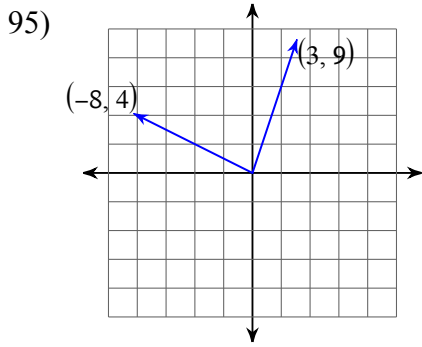


- A) 0 B) 26
 *C) 69 D) 13

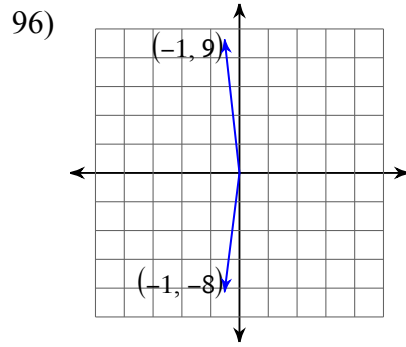
94)



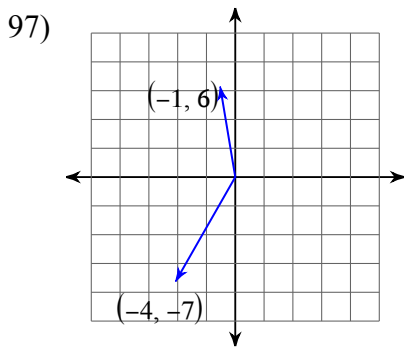
- *A) -64 B) -7
 C) 40 D) 45



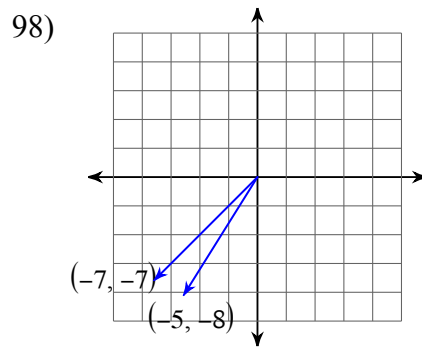
- *A) 12 B) 51
- C) -62 D) -21



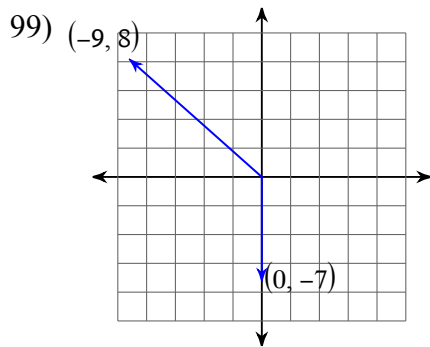
- A) -10 *B) -71
- C) 61 D) 3



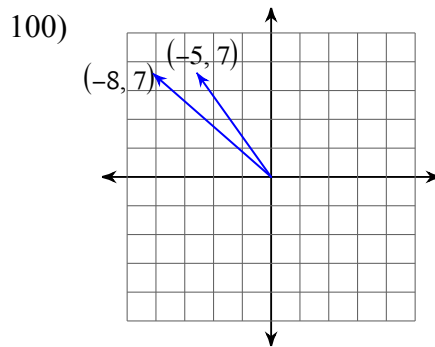
- A) -52 B) -36
- C) -35 *D) -38



- A) -10 B) -3
- C) -14 *D) 91



- A) 19 B) -16
C) -45 *D) -56



- A) -57 *B) 89
C) 46 D) -42

Find the measure of the angle between the two vectors.

101) $\mathbf{u} = \langle -3, -1 \rangle$
 $\mathbf{v} = \langle -8, -4 \rangle$

- A) 120.75° B) 139.61°
C) 142.94° *D) 8.13°

102) $\mathbf{u} = \langle 1, -8 \rangle$
 $\mathbf{v} = \langle 3, 7 \rangle$

- *A) 149.68° B) 177.84°
C) 107.1° D) 23.96°

103) $\mathbf{u} = \langle -9, -1 \rangle$
 $\mathbf{v} = \langle 4, 2 \rangle$

- *A) 159.78° B) 166.33°
C) 128.52° D) 74.05°

104) $\mathbf{u} = \langle -9, 1 \rangle$
 $\mathbf{v} = \langle 3, -9 \rangle$

- A) 68.39° B) 22.62°
*C) 114.78° D) 167.47°

105) $\mathbf{u} = \langle 5, 8 \rangle$
 $\mathbf{v} = \langle 6, 4 \rangle$

- A) 21.61° *B) 24.3°
C) 26.57° D) 82.87°

106) $\mathbf{u} = \langle -7, 0 \rangle$
 $\mathbf{v} = \langle -6, 3 \rangle$

- *A) 26.57° B) 15.07°
C) 30.96° D) 79.7°

107) $\mathbf{u} = \langle -5, -2 \rangle$
 $\mathbf{v} = \langle 3, -2 \rangle$

- A) 2.64° B) 21.8°
C) 173.09° *D) 124.51°

108) $\mathbf{u} = \langle -8, 9 \rangle$
 $\mathbf{v} = \langle 9, -4 \rangle$

- A) 63.43° *B) 155.6°
C) 49.4° D) 47.6°

109) $\mathbf{u} = \langle -3, 9 \rangle$
 $\mathbf{v} = \langle -5, 2 \rangle$

- *A) 49.76° B) 15.95°
C) 19.44° D) 59.04°

110) $\mathbf{u} = \langle 2, 7 \rangle$
 $\mathbf{v} = \langle -3, 6 \rangle$

- A) 139.64° B) 90°
*C) 42.51° D) 86.19°

111) $\mathbf{u} = \langle -7, -4 \rangle$
 $\mathbf{v} = \langle 7, -6 \rangle$

- A) 167.01° B) 91.01°
C) 67.83° *D) 109.65°

112) $\mathbf{u} = \langle 0, 4 \rangle$
 $\mathbf{v} = \langle -4, 7 \rangle$

- A) 160.35° B) 116.57°
C) 12.53° *D) 29.74°

113) $\mathbf{u} = \langle 0, -6 \rangle$
 $\mathbf{v} = \langle 1, -2 \rangle$

- A) 165.96° *B) 26.57°
C) 104.22° D) 24.62°

114) $\mathbf{u} = \langle 6, 4 \rangle$
 $\mathbf{v} = \langle -7, -5 \rangle$

- A) 169.7° B) 159.37°
*C) 178.15° D) 30.96°

115) $\mathbf{u} = \langle -1, -8 \rangle$
 $\mathbf{v} = \langle 1, -9 \rangle$

- A) 162.35° B) 104.62°
C) 9.46° *D) 13.47°

116) $\mathbf{u} = \langle -9, 8 \rangle$
 $\mathbf{v} = \langle 5, 5 \rangle$

- A) 32.42° B) 112.17°
C) 82.87° *D) 93.37°

117) $\mathbf{u} = \langle -7, 6 \rangle$
 $\mathbf{v} = \langle -4, -6 \rangle$

- *A) 96.91° B) 105.26°
C) 127.3° D) 10.86°

118) $\mathbf{u} = \langle -4, -8 \rangle$
 $\mathbf{v} = \langle -3, 1 \rangle$

- A) 124.78° B) 170.07°
*C) 81.87° D) 153.43°

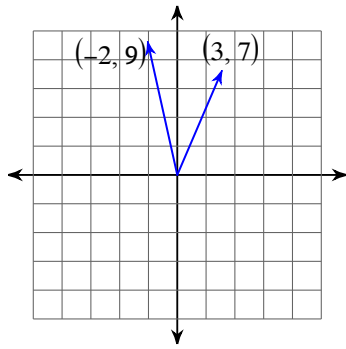
119) $\mathbf{u} = \langle 8, 8 \rangle$
 $\mathbf{v} = \langle 2, 7 \rangle$

- A) 71.57° B) 11.31°
*C) 29.05° D) 123.08°

120) $\mathbf{u} = \langle 9, 2 \rangle$
 $\mathbf{v} = \langle 1, -3 \rangle$

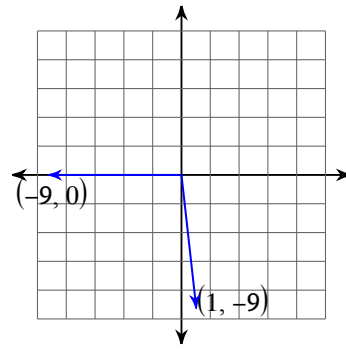
- A) 122.47° B) 112.75°
C) 99.46° *D) 84.09°

121)



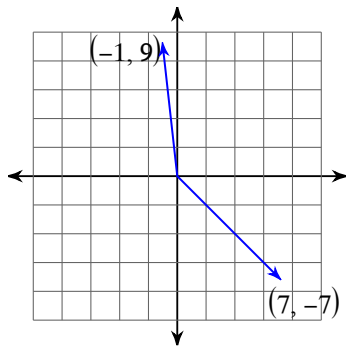
- A) 160.56° B) 71.57°
 C) 3.18° *D) 35.73°

122)



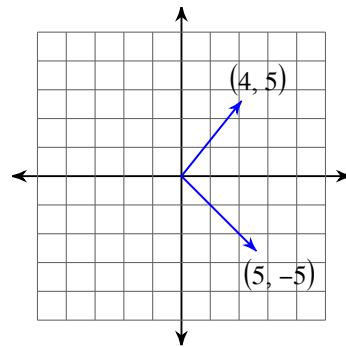
- *A) 96.34° B) 123.69°
 C) 21.16° D) 36.87°

123)



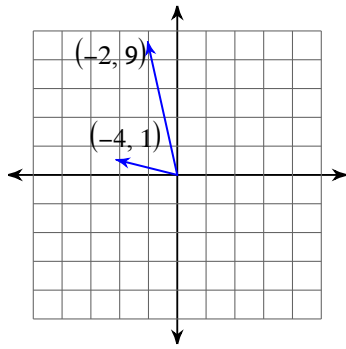
- A) 59.04° B) 180°
 *C) 141.34° D) 17.32°

124)



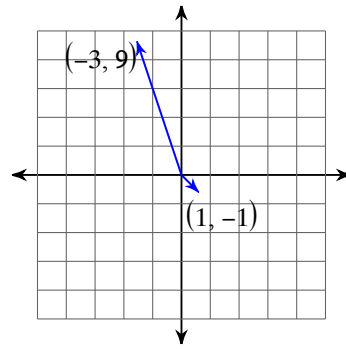
- A) 45° B) 136.91°
 *C) 96.34° D) 50.09°

125)



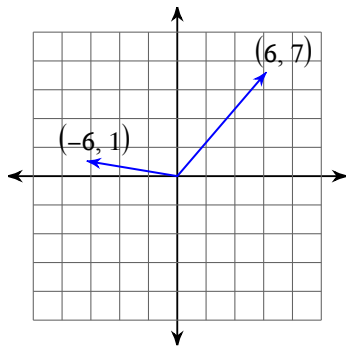
- A) 35.36° *B) 63.43°
 C) 156.61° D) 71.13°

126)



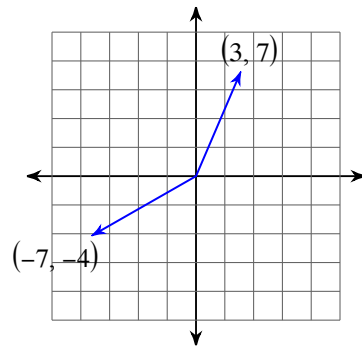
- *A) 153.43° B) 177.74°
 C) 35.54° D) 23.96°

127)

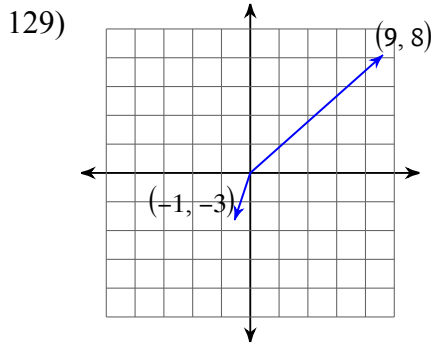


- A) 104.04° B) 54.73°
 *C) 121.14° D) 119.05°

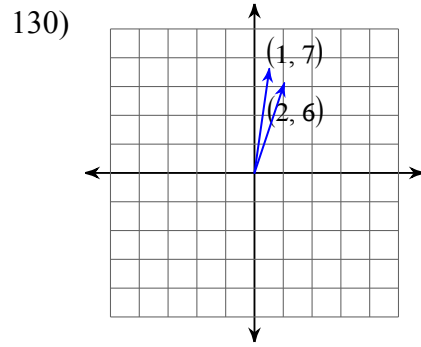
128)



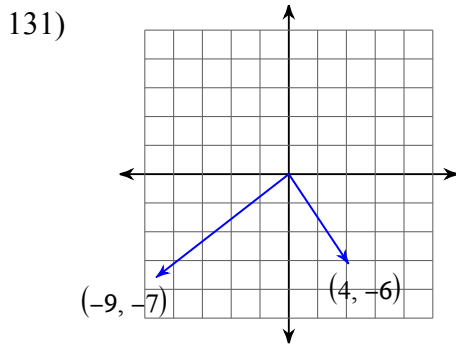
- *A) 142.94° B) 116.57°
 C) 155.12° D) 144.46°



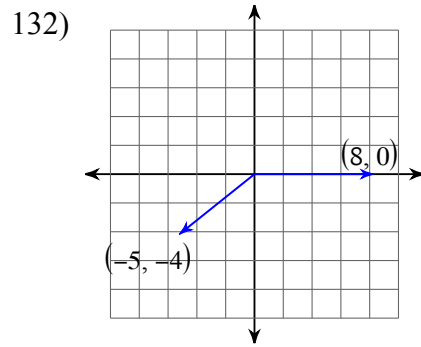
- *A) 150.07° B) 163.93°
 C) 135° D) 177.51°



- A) 120.75° *B) 10.3°
 C) 117.9° D) 135°

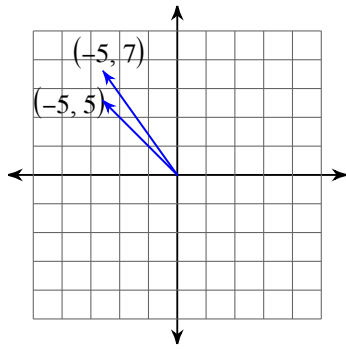


- A) 68.84° B) 174.35°
 C) 21.04° *D) 85.82°



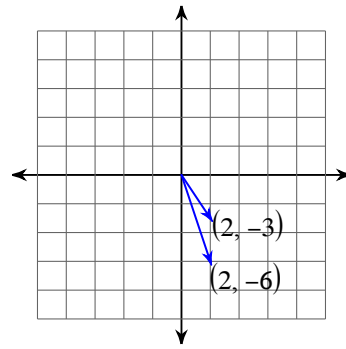
- *A) 141.34° B) 66.8°
 C) 180° D) 81.87°

133)



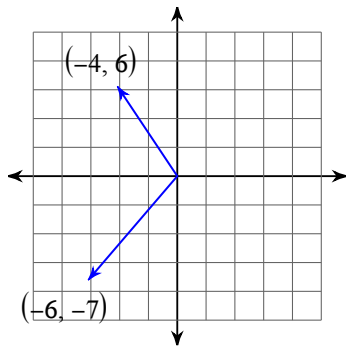
- *A) 9.46° B) 135°
 C) 142.13° D) 140.53°

134)



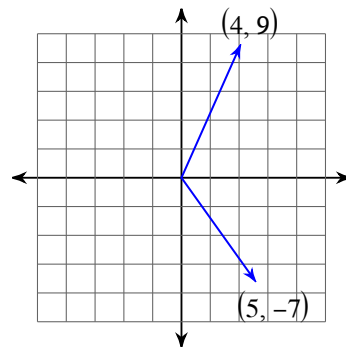
- A) 11.31° B) 107.65°
 C) 35.54° *D) 15.26°

135)



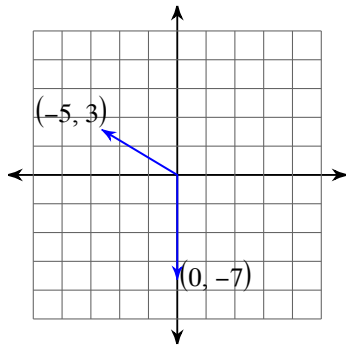
- A) 111.16° B) 117.6°
 C) 105.84° *D) 105.71°

136)



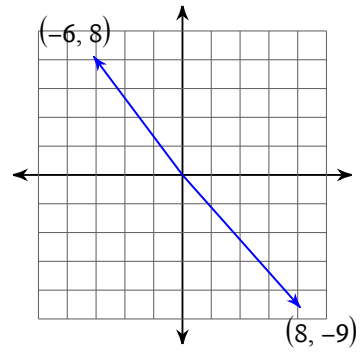
- A) 141.91° B) 159.44°
 *C) 120.5° D) 147.32°

137)



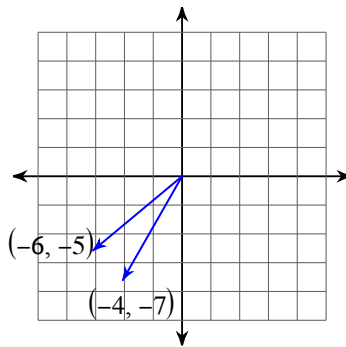
- A) 180° B) 149.47°
 *C) 120.96° D) 157.54°

138)



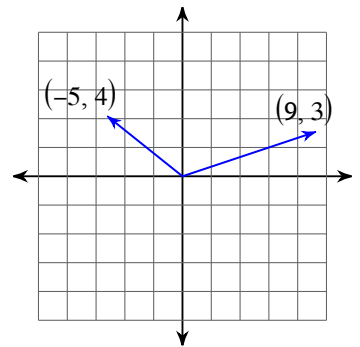
- A) 97.7° B) 29.74°
 *C) 175.24° D) 95.44°

139)



- *A) 20.45° B) 116.57°
 C) 53.13° D) 157.83°

140)



- A) 112.62° *B) 122.91°
 C) 158.84° D) 79.7°