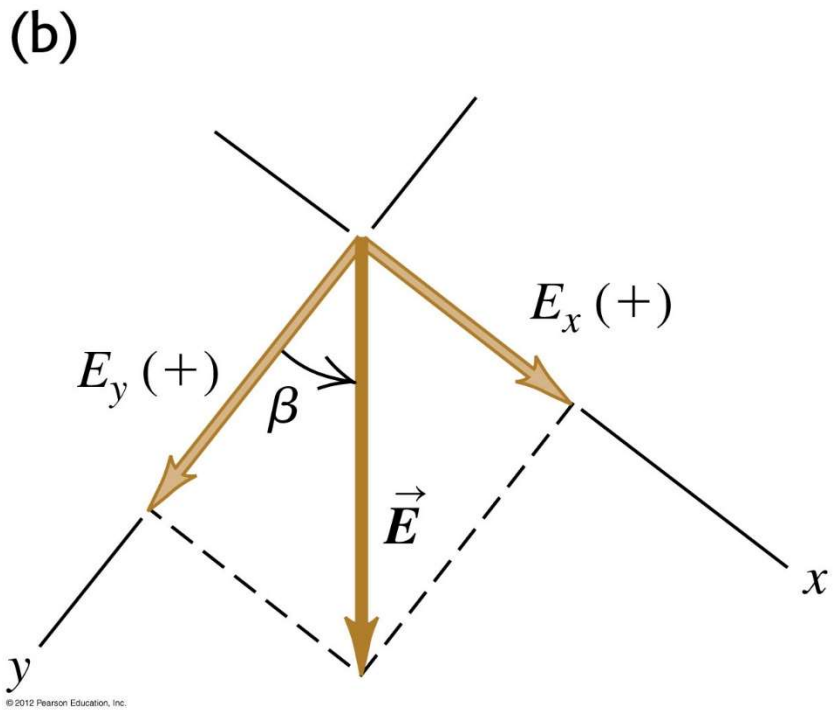
Q1.1

What are the x- and y-components of the vector $\vec{E}$?



A. $E_x = E\cos\beta$, $E_y = E\sin\beta$

B. $E_x = E\sin\beta$, $E_y = E\cos\beta$

C. $E_x = -E\cos\beta$, $E_y = -E\sin\beta$

D. $E_x = -E\sin\beta$, $E_y = -E\cos\beta$

E. $E_x = -E\cos\beta$, $E_y = E\sin\beta$

A1.1

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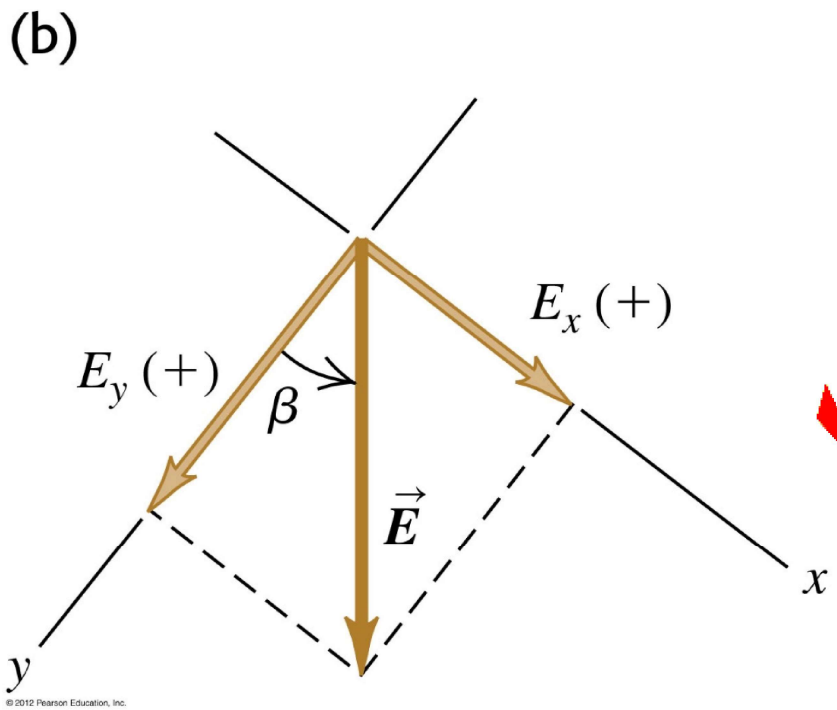

A. $E_x = E \cos \beta$, $E_y = E \sin \beta$

B. $E_x = E \sin \beta$, $E_y = E \cos \beta$ ✓

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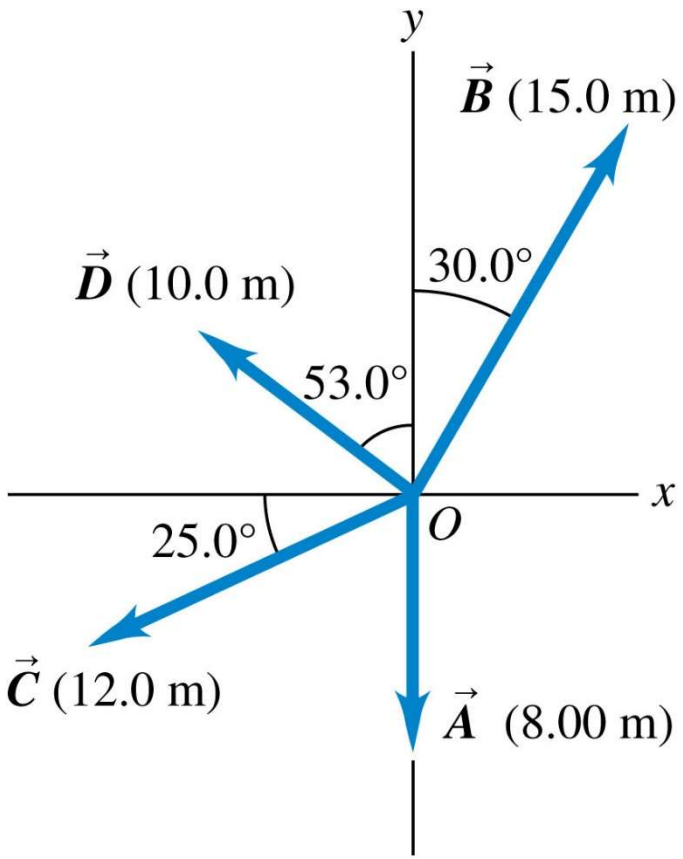
Q1.2



Consider the vectors shown. Which is a correct statement about $\vec{A} + \vec{B}$?

A. x-component > 0, y-component > 0

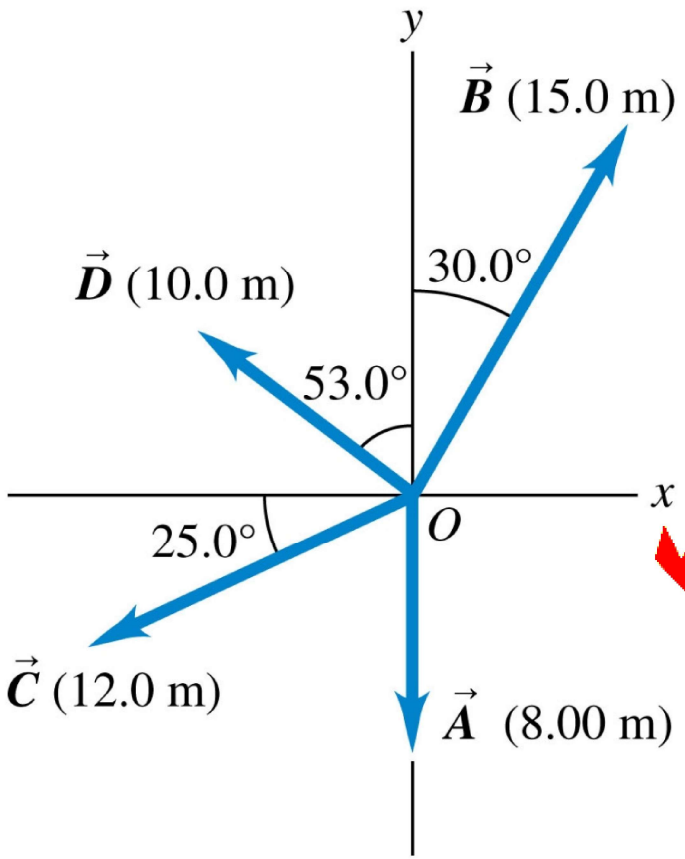
B. x-component > 0, y-component < 0

C. x-component < 0, y-component > 0

D. x-component < 0, y-component < 0

E. x-component = 0, y-component > 0

A1.2



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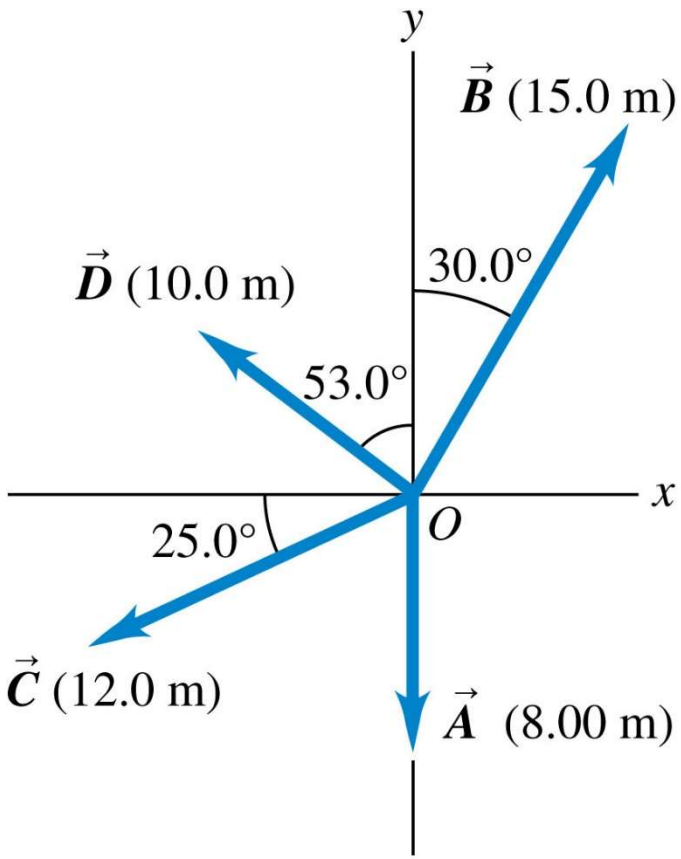
E. x-component = 0, y-component > 0

Q1.3



Consider the vectors shown. Which is a correct statement about $\vec{A} - \vec{B}$?

A. x-component > 0, y-component > 0

B. x-component > 0, y-component < 0

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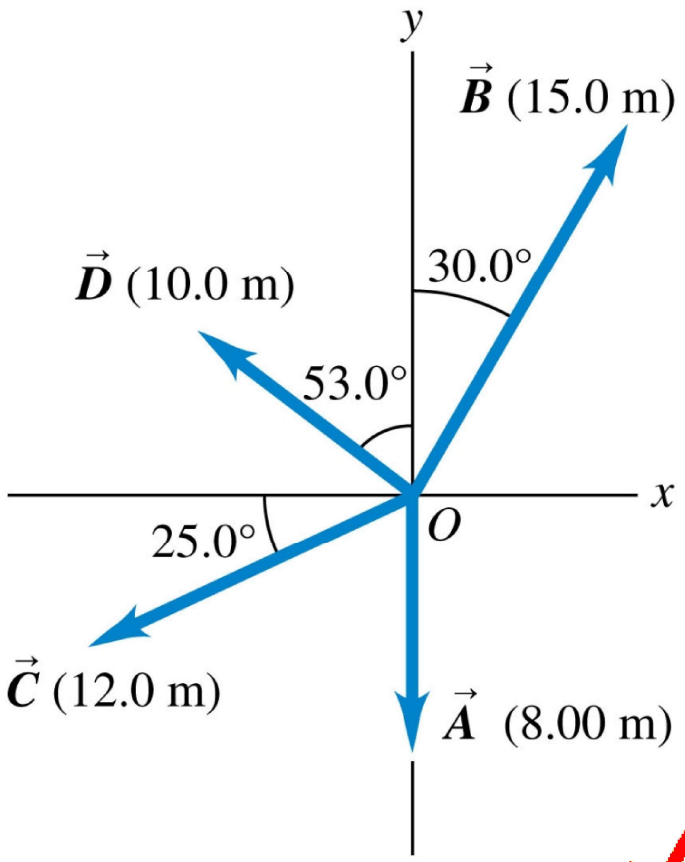
E. x-component = 0, y-component > 0

A1.3



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D. x-component < 0, y-component < 0

E. x-component = 0, y-component > 0

Q1.4

Which of the following statements is correct for *any* two vectors $\vec{A}$ and $\vec{B}$?

A. The magnitude of $\vec{A}+\vec{B}$ is $A + B$.

B. The magnitude of $\vec{A}+\vec{B}$ is $A - B$.

C. The magnitude of $\vec{A}+\vec{B}$ is greater than or equal to $|A - B|$.

D. The magnitude of $\vec{A}+\vec{B}$ is greater than the magnitude of $\vec{A}-\vec{B}$.

E. The magnitude of $\vec{A}+\vec{B}$ is $\sqrt{A^2 + B^2}$.

A1.4

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E. The magnitude of $\vec{A}+\vec{B}$ is $\sqrt{A^2 + B^2}$.

Q1.5

Which of the following statements is correct for *any* two vectors $\vec{A}$ and $\vec{B}$?

A. The magnitude of $\vec{A} - \vec{B}$ is $A - B$.

B. The magnitude of $\vec{A} - \vec{B}$ is $A + B$.

C. The magnitude of $\vec{A} - \vec{B}$ is greater than or equal to $|A - B|$.

D. The magnitude of $\vec{A} - \vec{B}$ is less than the magnitude of $\vec{A} + \vec{B}$.

E. The magnitude of $\vec{A} - \vec{B}$ is $\sqrt{A^2 + B^2}$.

A1.5

Which of the following statements is correct for *any* two vectors $\vec{A}$ and $\vec{B}$?

A. The magnitude of $\vec{A} - \vec{B}$ is $A - B$.

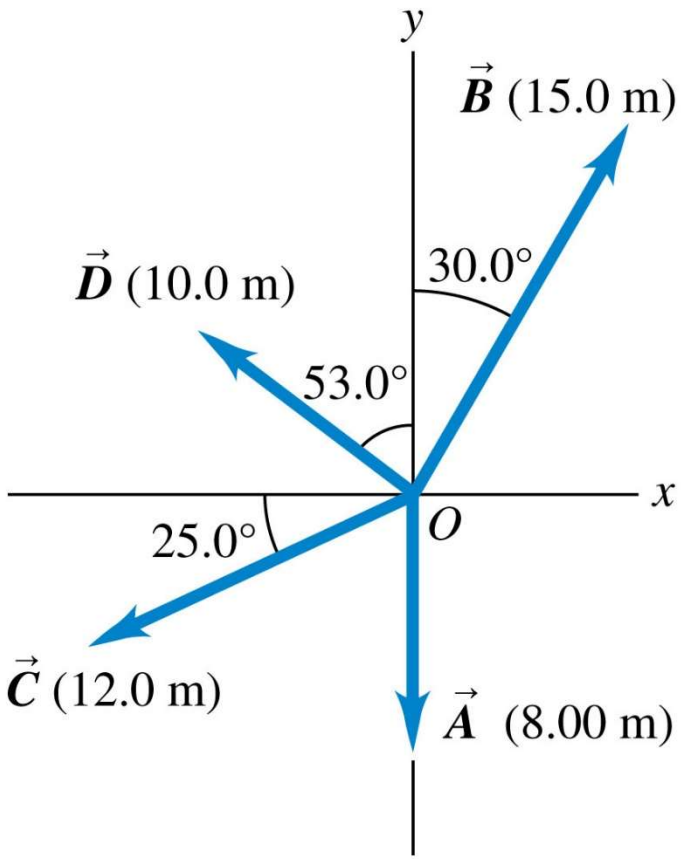
B. The magnitude of $\vec{A} - \vec{B}$ is $A + B$.

C. The magnitude of $\vec{A} - \vec{B}$ is greater than or equal to $|A - B|$.

D. The magnitude of $\vec{A} - \vec{B}$ is less than the magnitude of $\vec{A} + \vec{B}$.

E. The magnitude of $\vec{A} - \vec{B}$ is $\sqrt{A^2 + B^2}$.

Q1.6



Consider the vectors shown.

What are the components of the vector $\vec{E} = \vec{A} + \vec{D}$?

A. $E_x = -8.00$ m, $E_y = -2.00$ m

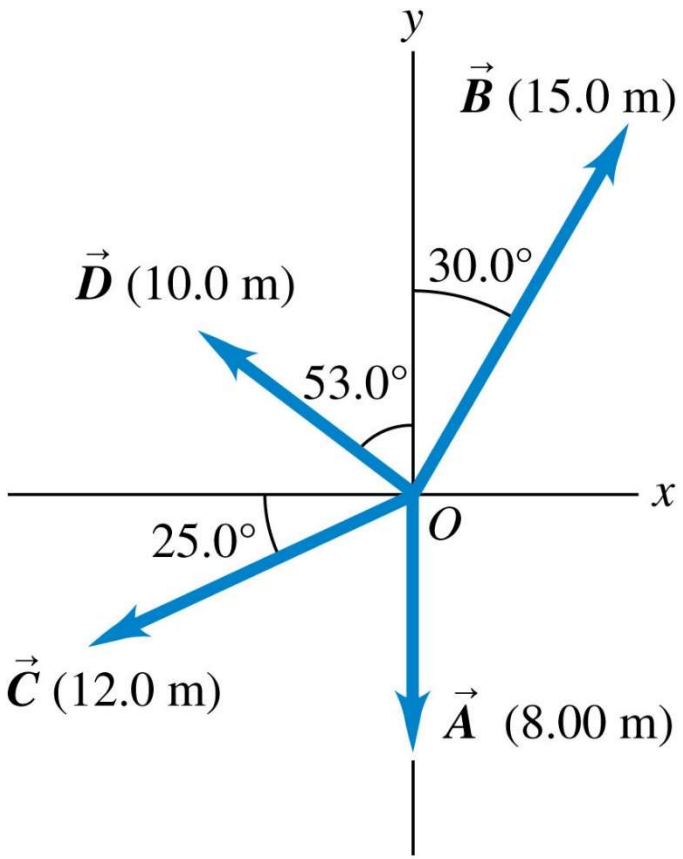
B. $E_x = -8.00$ m, $E_y = +2.00$ m

C. $E_x = -6.00$ m, $E_y = 0$

D. $E_x = -6.00$ m, $E_y = +2.00$ m

E. $E_x = -10.0$ m, $E_y = 0$

A1.6



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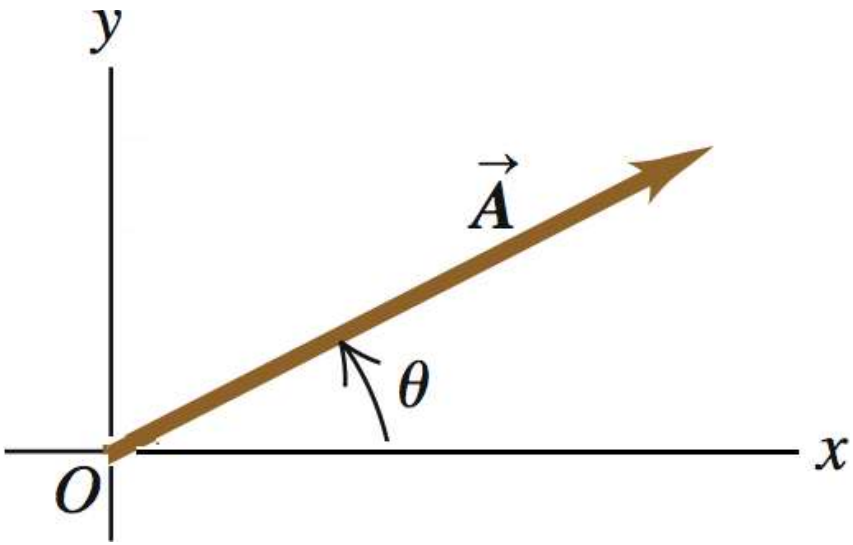
B. $E_x = -8.00$ m, $E_y = +2.00$ m

C. $E_x = -6.00$ m, $E_y = 0$

D. $E_x = -6.00$ m, $E_y = +2.00$ m

E. $E_x = -10.0$ m, $E_y = 0$

Q1.7



The angle θ is measured counterclockwise from the positive x-axis as shown. For which of these vectors is θ greatest?

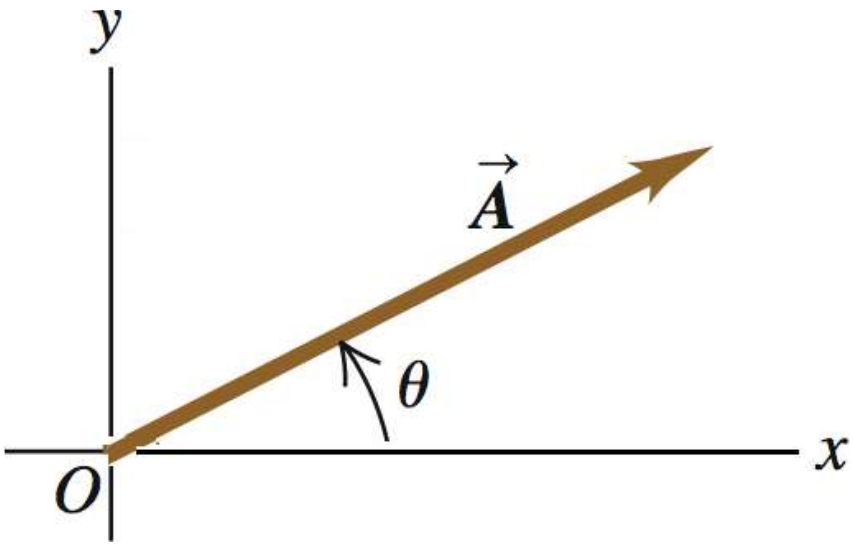
A. $24\hat{i} + 18\hat{j}$

B. $-24\hat{i} - 18\hat{j}$

C. $-18\hat{i} + 24\hat{j}$

D. $-18\hat{i} - 24\hat{j}$

A1.7



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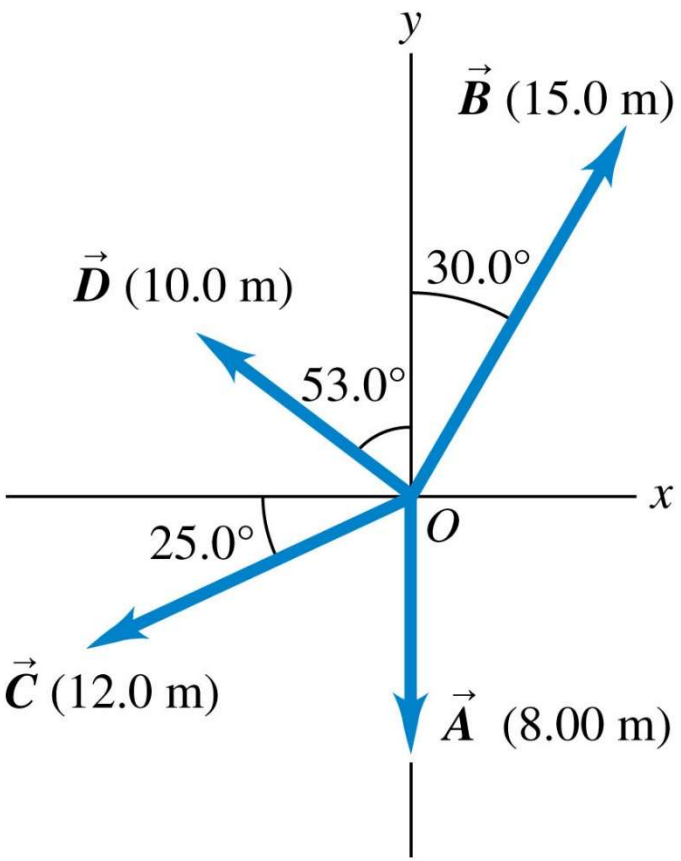
C. $-18\hat{i} + 24\hat{j}$

✓ D. $-18\hat{i} - 24\hat{j}$

Q1.8



Consider the vectors shown.

What is the dot product $\vec{C} \bullet \vec{D}$?

A. $(120\ \text{m}^2)\cos 78.0°$

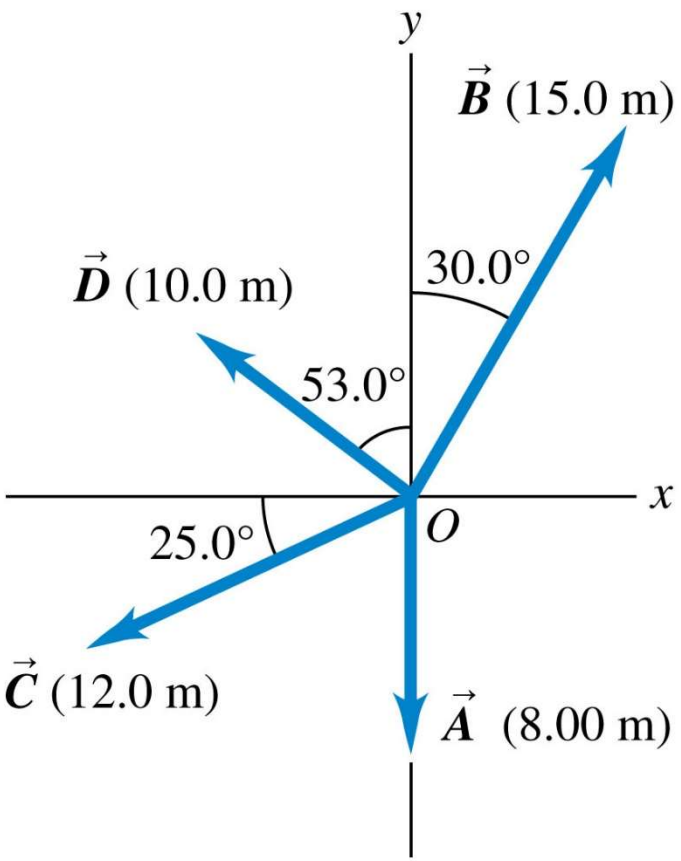
B. $(120\ \text{m}^2)\sin 78.0°$

C. $(120\ \text{m}^2)\cos 62.0°$

D. $(120\ \text{m}^2)\sin 62.0°$

E. none of these

A1.8



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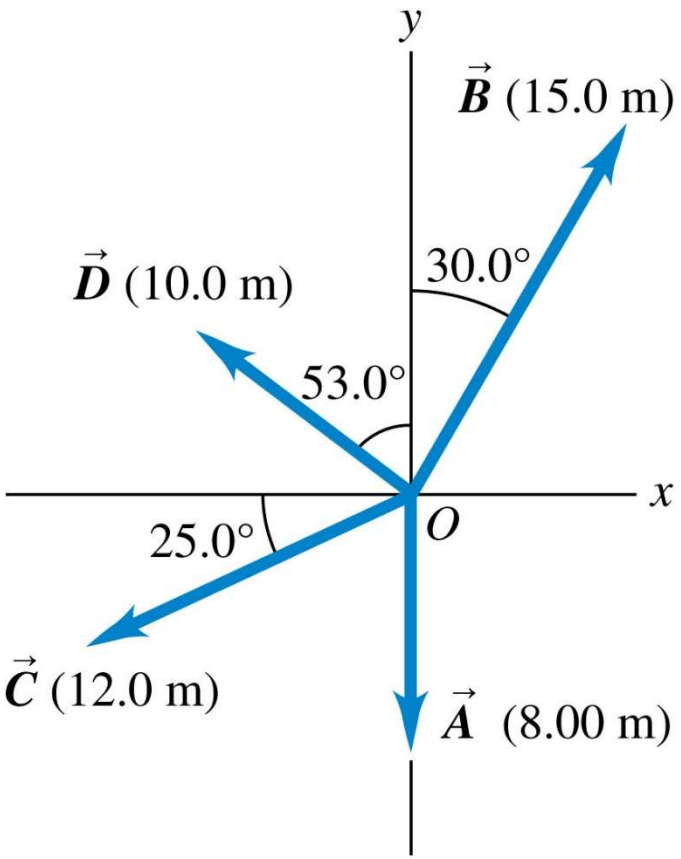
B. $(120\ \text{m}^2)\sin 78.0°$

C. $(120\ \text{m}^2)\cos 62.0°$ ✓

D. $(120\ \text{m}^2)\sin 62.0°$

E. none of these

Q1.9



Consider the vectors shown.

What is the cross product $\vec{A} \times \vec{C}$?

A. $(96.0\ \text{m}^2)\sin 25.0°\,\hat{k}$

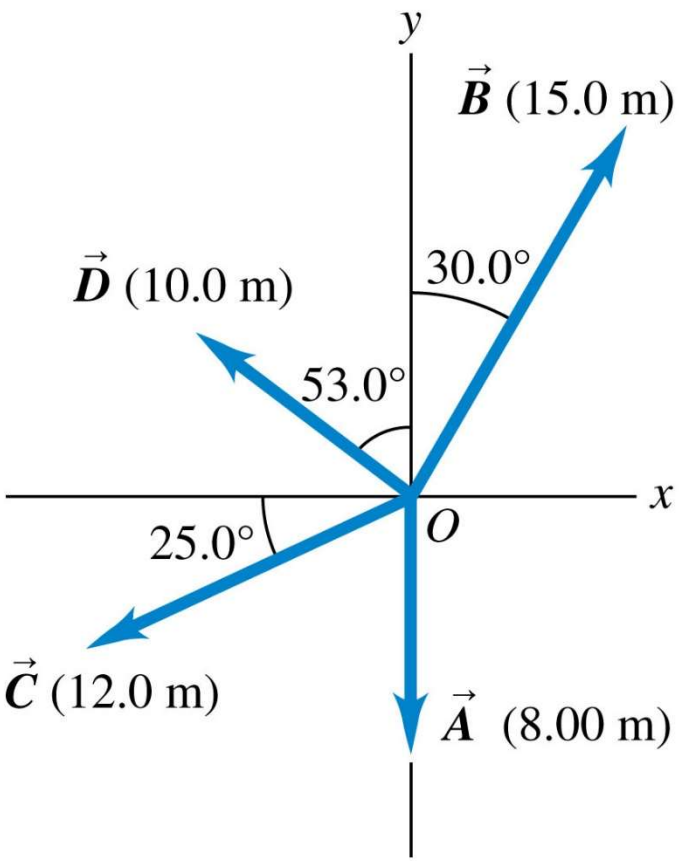
B. $(96.0\ \text{m}^2)\cos 25.0°\,\hat{k}$

C. $-(96.0\ \text{m}^2)\sin 25.0°\,\hat{k}$

D. $-(96.0\ \text{m}^2)\cos 25.0°\,\hat{k}$

E. none of these

A1.9



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What is the cross product $\vec{A} \times \vec{C}$?

A. $(96.0\ \text{m}^2)\sin 25.0°\,\hat{k}$

B. $(96.0\ \text{m}^2)\cos 25.0°\,\hat{k}$

C. $-(96.0\ \text{m}^2)\sin 25.0°\,\hat{k}$

✓ D. $-(96.0\ \text{m}^2)\cos 25.0°\,\hat{k}$

E. none of these

Q1.10

Consider the two vectors

$$\vec{A} = 3\hat{i} + 4\hat{j}$$

$$\vec{B} = -8\hat{i} + 6\hat{j}$$

What is the dot product $\vec{A} \bullet \vec{B}$?

A. zero

B. 14

C. 48

D. 50

E. none of these

A1.10

Consider the two vectors

$$\vec{A} = 3\hat{i} + 4\hat{j}$$

$$\vec{B} = -8\hat{i} + 6\hat{j}$$

What is the dot product $\vec{A} \bullet \vec{B}$?

A. zero

B. 14

C. 48

D. 50

E. none of these

Q1.11

Consider the two vectors

$$\vec{A} = 3\hat{i} + 4\hat{j}$$

$$\vec{B} = -8\hat{i} + 6\hat{j}$$

What is the cross product $\vec{A} \times \vec{B}$?

A. $6\hat{k}$

B. $-6\hat{k}$

C. $50\hat{k}$

D. $-50\hat{k}$

E. none of these

A1.11

Consider the two vectors

$$\vec{A} = 3\hat{i} + 4\hat{j}$$

$$\vec{B} = -8\hat{i} + 6\hat{j}$$

What is the cross product $\vec{A} \times \vec{B}$?

A. $6\hat{k}$

B. $-6\hat{k}$

C. $50\hat{k}$

D. $-50\hat{k}$

E. none of these

Q1.12

Consider the two vectors

$$\vec{A} = 3\hat{i} - 4\hat{j}$$

$$\vec{B} = 6\hat{k}$$

What is the dot product $\vec{A} \bullet \vec{B}$?

A. zero

B. –6

C. +6

D. 42

E. –42

A1.12

Consider the two vectors

$$\vec{A} = 3\hat{i} - 4\hat{j}$$

$$\vec{B} = 6\hat{k}$$

What is the dot product $\vec{A} \bullet \vec{B}$?

A. zero

B. –6

C. +6

D. 42

E. –42

Q1.13

Consider the two vectors

$$\vec{A} = 3\hat{i} - 4\hat{j}$$

$$\vec{B} = 6\hat{k}$$

What is the cross product $\vec{A} \times \vec{B}$?

A. zero

B. $24\hat{i} + 18\hat{j}$

C. $-24\hat{i} - 18\hat{j}$

D. $-18\hat{i} + 24\hat{j}$

E. $-18\hat{i} - 24\hat{j}$

A1.13

Consider the two vectors

$$\vec{A} = 3\hat{i} - 4\hat{j}$$

$$\vec{B} = 6\hat{k}$$

What is the cross product $\vec{A} \times \vec{B}$?

A. zero

B. $24\hat{i} + 18\hat{j}$

C. $-24\hat{i} - 18\hat{j}$

D. $-18\hat{i} + 24\hat{j}$

E. $-18\hat{i} - 24\hat{j}$