

Topic: Dot product of two vectors**Question:** Find the dot product.

$$x = \langle 5, -1 \rangle$$

$$y = \langle 3, 2 \rangle$$

Answer choices:

A 11

B 13

C 9

D 17



Solution: B

To find the dot product of two vectors, we simply multiply like coordinates together and then add them to each other. So the dot product of $x = \langle 5, -1 \rangle$ and $y = \langle 3, 2 \rangle$ can be given by

$$x \cdot y = (5)(3) + (-1)(2)$$

$$x \cdot y = 15 - 2$$

$$x \cdot y = 13$$



Topic: Dot product of two vectors**Question:** Find the dot product.

$$x = \langle -4, 0, 12 \rangle$$

$$y = \langle 9, -12, 8 \rangle$$

Answer choices:

- A 48
- B 132
- C 72
- D 60



Solution: D

To find the dot product of two vectors, we simply multiply like coordinates together and then add them to each other. So the dot product of $x = \langle -4, 0, 12 \rangle$ and $y = \langle 9, -12, 8 \rangle$ can be given by

$$x \cdot y = (-4)(9) + (0)(-12) + (12)(8)$$

$$x \cdot y = -36 + 0 + 96$$

$$x \cdot y = 60$$



Topic: Dot product of two vectors**Question:** Find the dot product.

$$x = -4\mathbf{i} - 2\mathbf{j} + 7\mathbf{k}$$

$$y = 6\mathbf{i} - \mathbf{j} - 10\mathbf{k}$$

Answer choices:

A -96

B -44

C -92

D -48



Solution: C

To find the dot product of two vectors, we simply multiply like coordinates together and then add them to each other.

Taking the direction numbers from the given vectors lets us rewrite them as

$$x = -4\mathbf{i} - 2\mathbf{j} + 7\mathbf{k}$$

$$x = \langle -4, -2, 7 \rangle$$

and

$$y = 6\mathbf{i} - \mathbf{j} - 10\mathbf{k}$$

$$y = \langle 6, -1, -10 \rangle$$

So the dot product of $x = -4\mathbf{i} - 2\mathbf{j} + 7\mathbf{k}$ and $y = 6\mathbf{i} - \mathbf{j} - 10\mathbf{k}$ can be given by

$$x \cdot y = (-4)(6) + (-2)(-1) + (7)(-10)$$

$$x \cdot y = -24 + 2 - 70$$

$$x \cdot y = -92$$

