Section V.4: Cross Product

Exercises

1. Vector **A** is in the *y*-direction, while vector **B** is in the negative *x*-direction. What is the direction of **A×B? B×A?**

2. Vector **A** is in the *z*-direction, while vector **B** is in the *y*-direction. What is the direction of **A×B? B×A?**

Calculate the cross product **A×B** for the following vectors.

3. **A** = **i** , **B** = **j**

4. **A** = **j** , **B** = **i**

5. **A** = **i** , **B** = **k**

6. **A** = **k**, **B** = **i**

7. **A** = **k**, **B** = **j**

8. **A** = **j**, **B** = **j**

9. **A** = 2**i** – 9**j** – **k**, **B** = 3**i** + **j** – 4**k**

10. **A** = 12**i** – 5**k**, **B** = 3**i** + **j** – 4**k**

11. **A** = **k**, **B** = 3**i** + 2**j** – 7**k**

12. **A** = 2**i** – **j**, **B** = 2**i** – **k**

13. **A** = 5**i** +6**j** – 7**k**, **B** = **i** + 12**j** – 2**k**

14. Consider your answer to #13. What's the magnitude of the vector in your answer?

15. [tricksy] Consider the following pair of vectors: **A** = – 9**j** – 4**k**, **B** = 3**i** + 5**j**

    Calculate the angle between these vectors using

    a) the dot product
    b) the cross product

    Are your answers for a) and b) the same? If not, what happened? And why is the dot product the preferred method here?