

**Math 122**  
**Quiz 11 Review**

1. For  $\vec{a} = \langle 2, 1, 1 \rangle$  and  $\vec{b} = \langle 1, -1, -1 \rangle$ , find  $\vec{a} \times \vec{b}$ .
2. For  $\vec{a} = \langle 1, -1, 0 \rangle$  and  $\vec{b} = \langle 1, 1, 0 \rangle$ , find  $\vec{a} \times \vec{b}$ .
3. For  $\vec{a} = \langle 3, -4, 1 \rangle$  and  $\vec{b} = \langle 2, -2, 3 \rangle$ , find  $\vec{a} \times \vec{b}$ .
4. If  $\langle -1, 3, 5 \rangle \times \langle 0, a, 1 \rangle = \langle -2, 1, -1 \rangle$ , what is  $a$ ?
5. Find two unit vectors perpendicular to both  $\vec{a} = \langle 1, 2, 1 \rangle$  and  $\vec{b} = \langle 3, -4, 2 \rangle$ .
6. Find two unit vectors perpendicular to both  $\vec{a} = \langle 1, 2, 3 \rangle$  and  $\vec{b} = \langle -1, 0, 1 \rangle$ .
7. Find the area of the parallelogram spanned by the vectors  $\vec{a} = \langle 3, -3, 1 \rangle$  and  $\vec{b} = \langle -4, 9, 2 \rangle$ .
8. Find the area of the parallelogram with vertices:  $(0, -1)$ ,  $(3, 4)$ ,  $(1, 6)$  and  $(-2, 1)$
9. Find the area of the triangle with vertices  $A(1, 2, 3)$ ,  $B(6, 4, 7)$ , and  $C(1, 5, 2)$ .
10. Compute  $\|\vec{u} \times \vec{v}\|$  if  $\|\vec{u}\| = 2$  and  $\|\vec{v}\| = 5$  and the angle between  $\vec{u}$  and  $\vec{v}$  is  $\theta = \frac{\pi}{6}$ .
11. Let  $\vec{a} = \langle 3, -4, 0 \rangle$ ,  $\vec{b} = \langle 1, -2, 2 \rangle$ , and  $\vec{c} = \langle 1, -1, 0 \rangle$ ; find  $\vec{c} \cdot (\vec{a} \times \vec{b})$ .
12. If  $\vec{A} \times \vec{B} = \vec{A} \times \vec{C}$  and  $\vec{A} \neq \vec{0}$  does  $\vec{B} = \vec{C}$

### Answers

1.  $\vec{a} \times \vec{b} = \langle 0, 3, -3 \rangle$
2.  $\vec{a} \times \vec{b} = \langle 0, 0, 2 \rangle$
3.  $\vec{a} \times \vec{b} = \langle -10, -7, 2 \rangle$
4.  $a = 1$
5.  $\pm \frac{1}{\sqrt{165}} \langle 8, 1, -10 \rangle$
6.  $\pm \frac{1}{\sqrt{6}} \langle 1, -2, 1 \rangle$
7.  $5\sqrt{22}$
8. 16
9.  $\frac{1}{2}\sqrt{446}$
10. 5
11. -2
12. NO