Use this example for the following two problems on page 2:

l) Projection of the *f*x(x2–3y2) orbital. Assume the lobes of the orbital are coplanar and the z axis is perpendicular to the page.



1. Consider an atom having the *f*x(x2–3y2) orbital projection presented above. What *d* and *p* orbitals of a second atom would have the appropriate symmetry to form bonding and antibonding orbitals with this *f* orbital? Consider all *d* and *p* orbitals and defend your answer, including drawings. **Assume the internuclear axis is the z axis and the incoming atom has the same axis system as the atom with the *f*x(x2–3y2) orbital projection.**

2. Consider an atom having the *f*x(x2–3y2) orbital projection presented above. What *d* and *p* orbitals of a second atom would have the appropriate symmetry to form bonding and antibonding orbitals with this *f* orbital? Consider all *d* and *p* orbitals and defend your answer, including drawings. **Assume the internuclear axis is the y axis and the incoming atom has the same axis system as the atom with the *f*x(x2–3y2) orbital projection.**