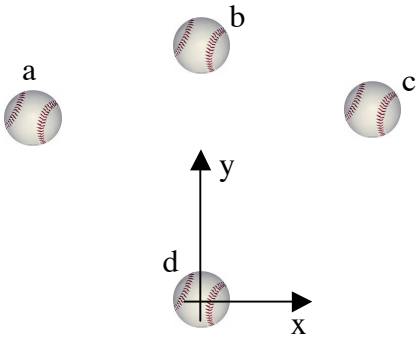
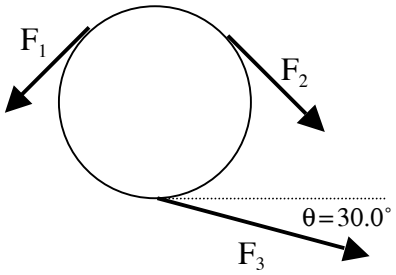
1. For the two vectors $\vec{A} = -3.00\hat{i} + 2.00\hat{j}$ and $\vec{B} = 1.00\hat{i} + 3.00\hat{j}$, find (a)their magnitudes, (b)their cross product, and (c)the angle between them.

2. For each of the situations at the right gravity acts along the negative y-axis. Find the direction of the torque on the baseball due to gravity about the origin in each case.



3. A pawl is a toothed gear used to allow something to only turn in one direction as shown in the photo at the right. The sketch below shows a 3.00cm diameter pawl with three forces acting on it. $F_1 = 5.00N$, $F_2 = 7.00N$, and $F_3 = 10.0N$. Find the total torque (magnitude and direction) acting on the pawl about its center.



4. A lazy fly ball is hit toward an outfielder 100m due north from home plate. Using a coordinate system with an origin at home, the x-axis toward the fielder, and the y-axis vertical, the position of the ball is given by $\vec{r} = 70.0\hat{i} + 8.00\hat{j}$ in meters. Find the torque exerted by gravity on the ball about (a)home plate and (b)the outfielder. The mass of a baseball is 150g.