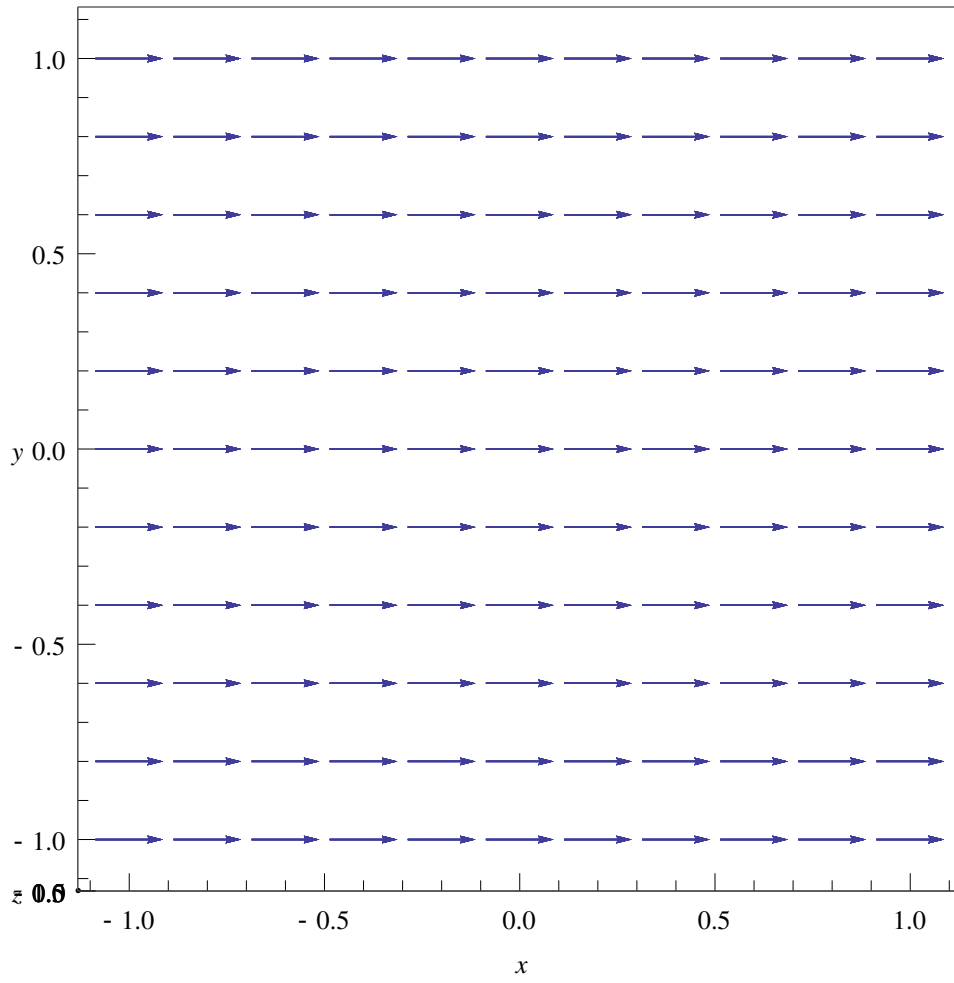
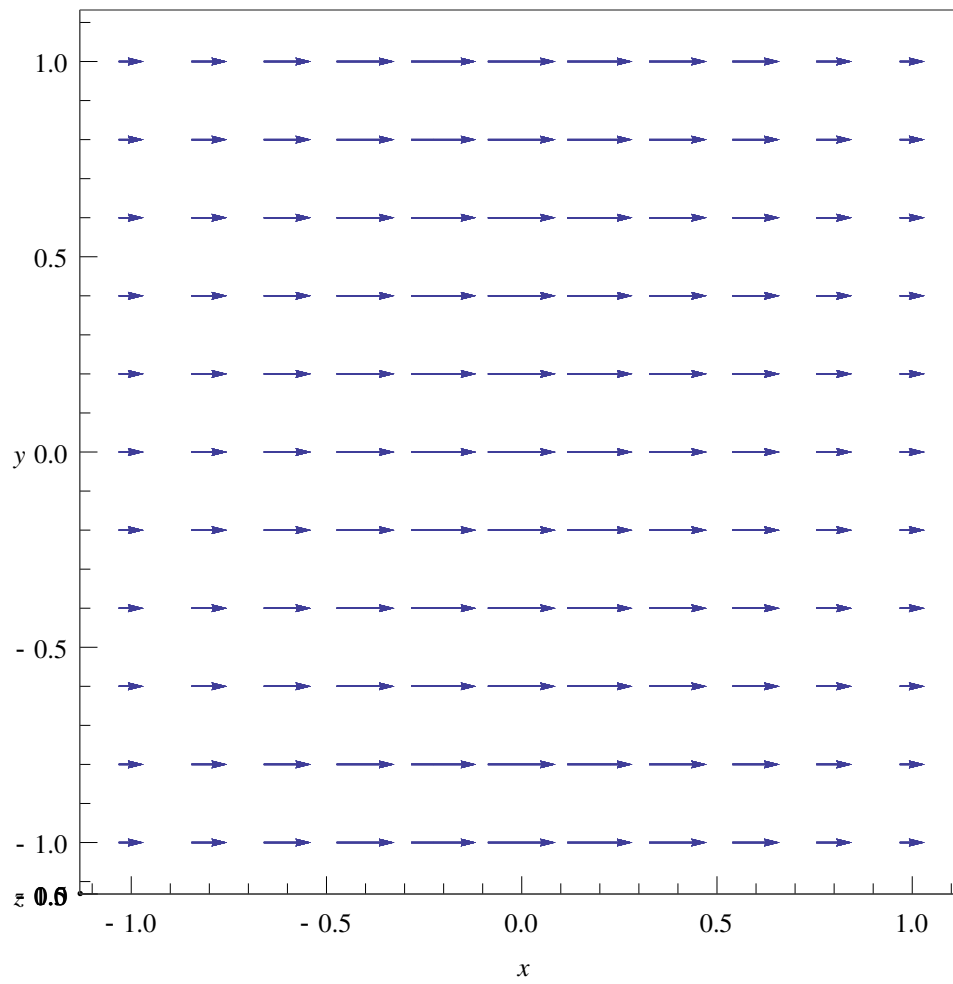
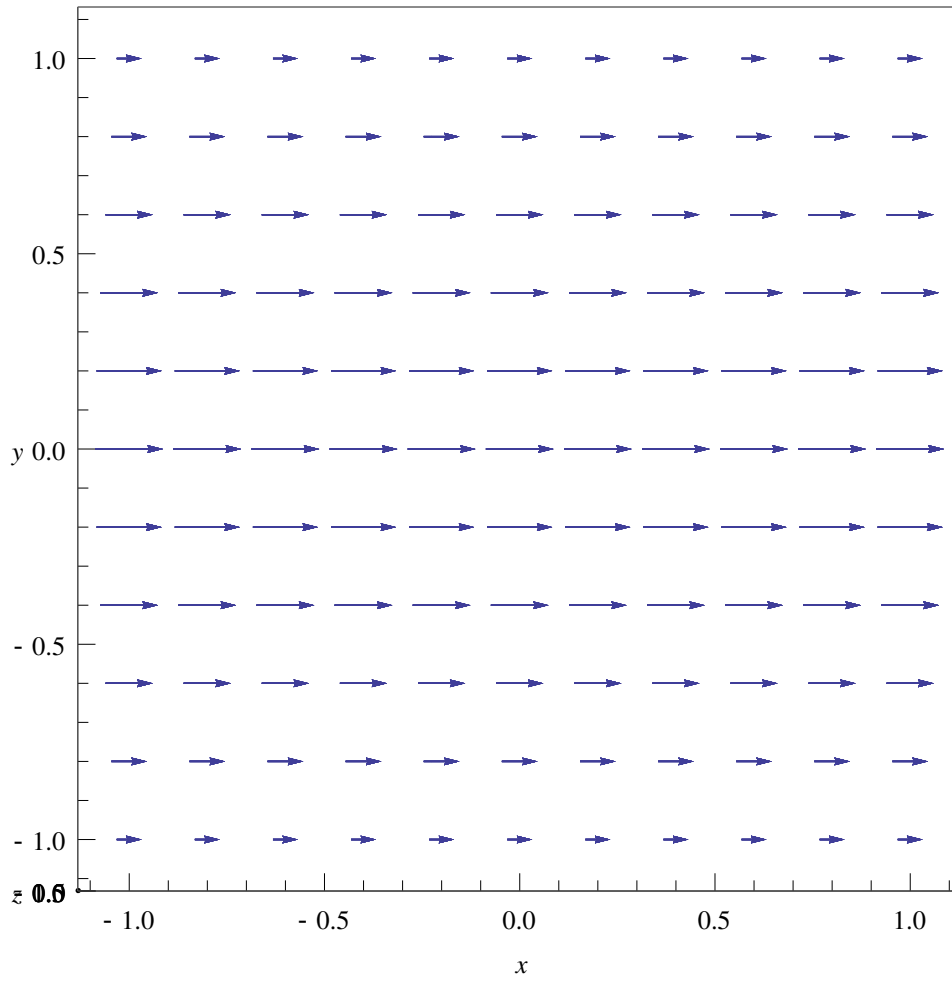


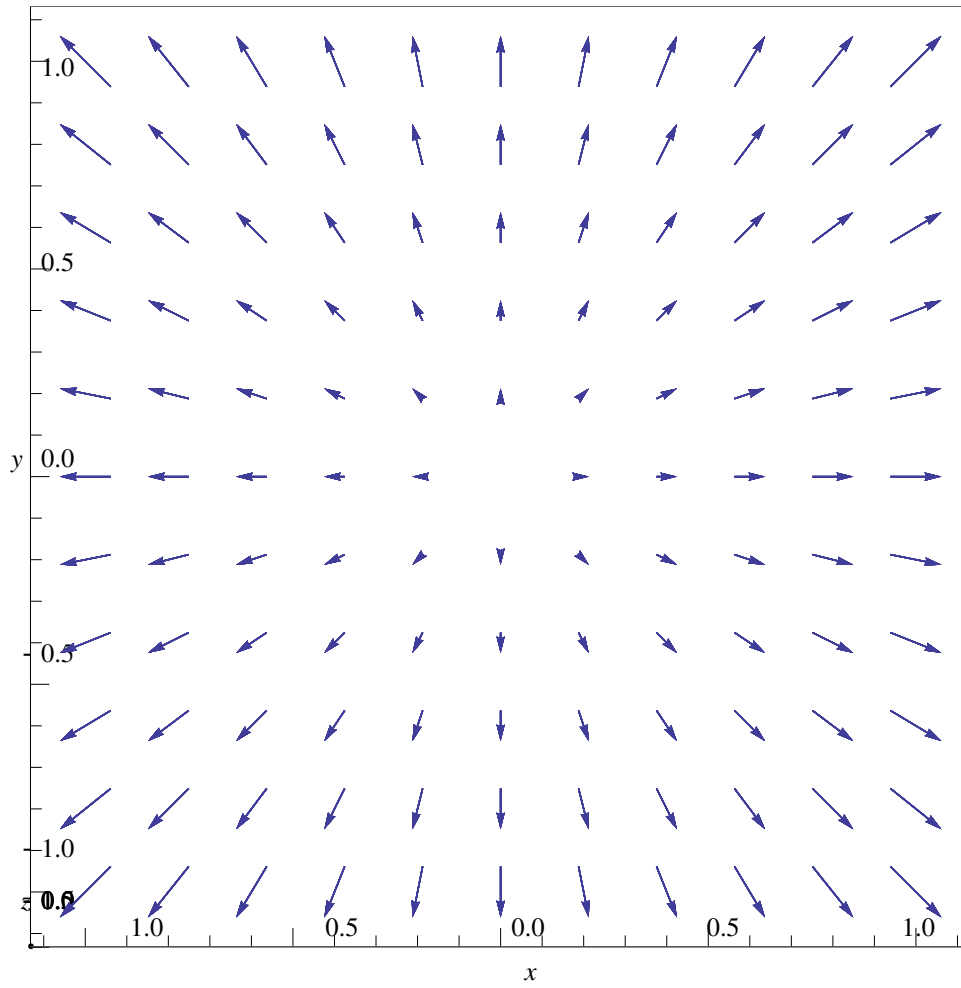
For each of the vector fields below, decide whether the divergence is positive, negative, or zero in each quadrant. Be prepared to defend your answers.


$$F_1$$

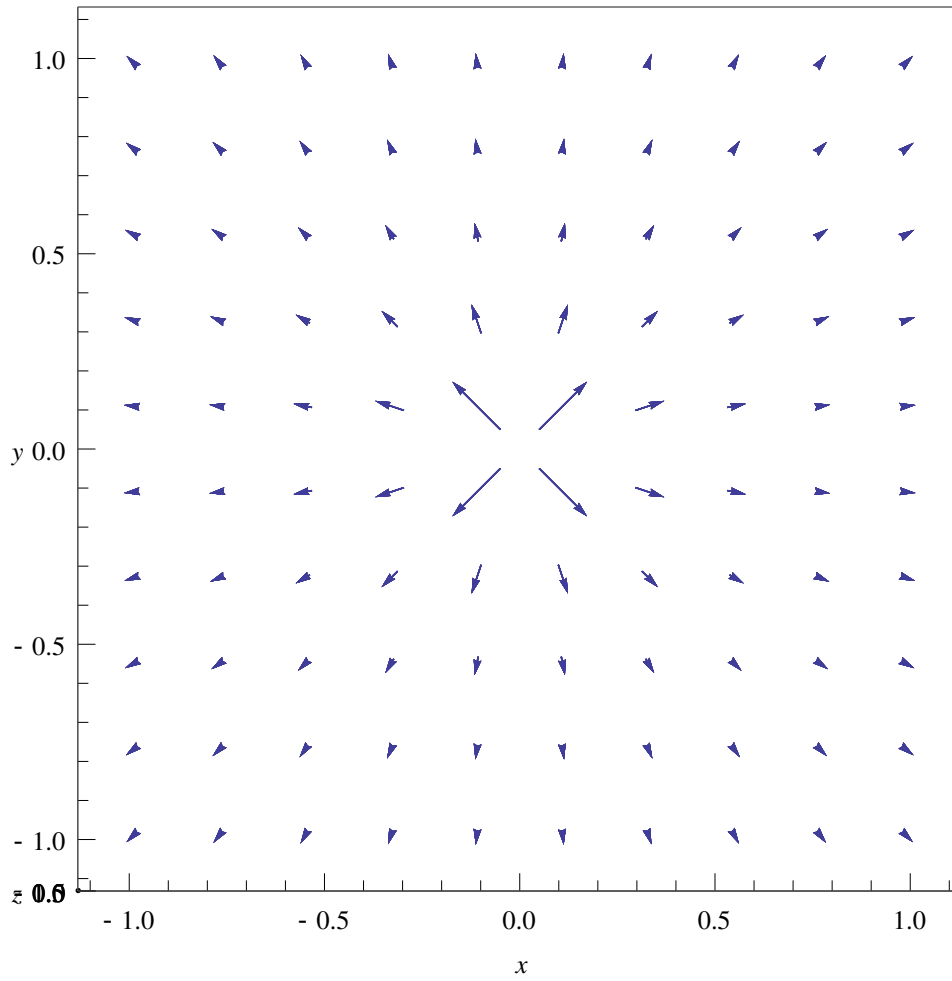

$$F_2$$



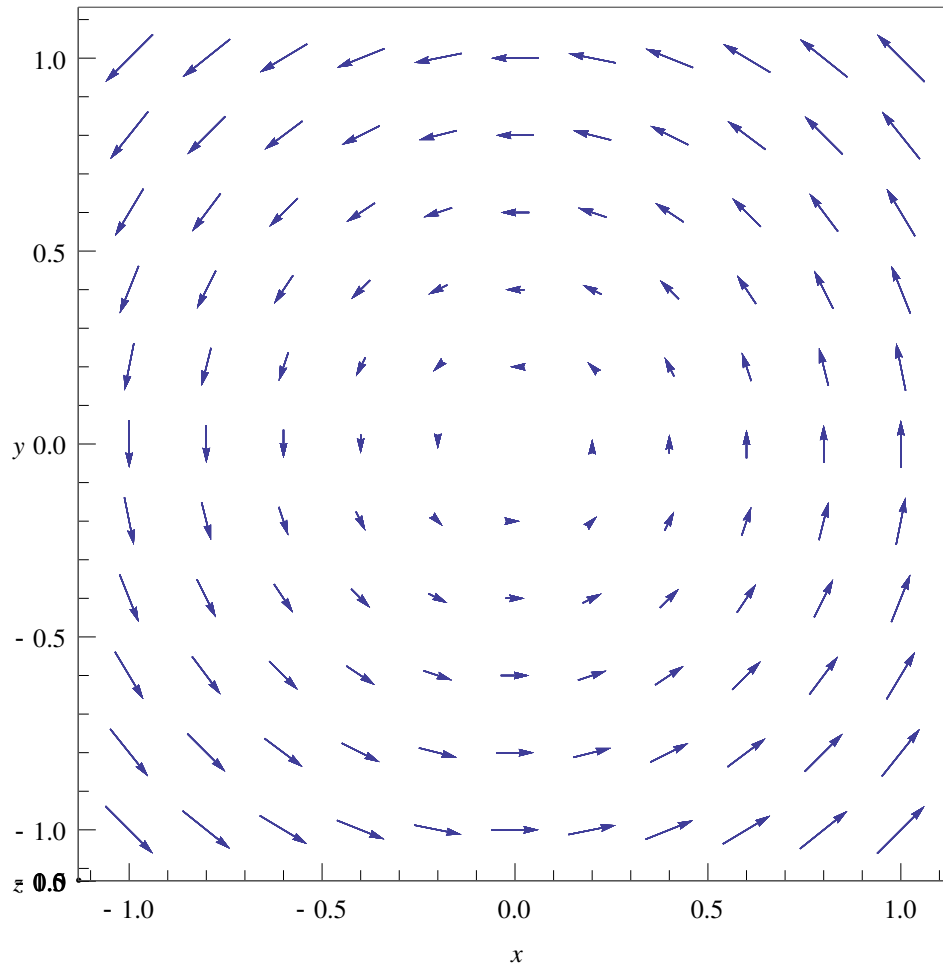
$$F_3$$



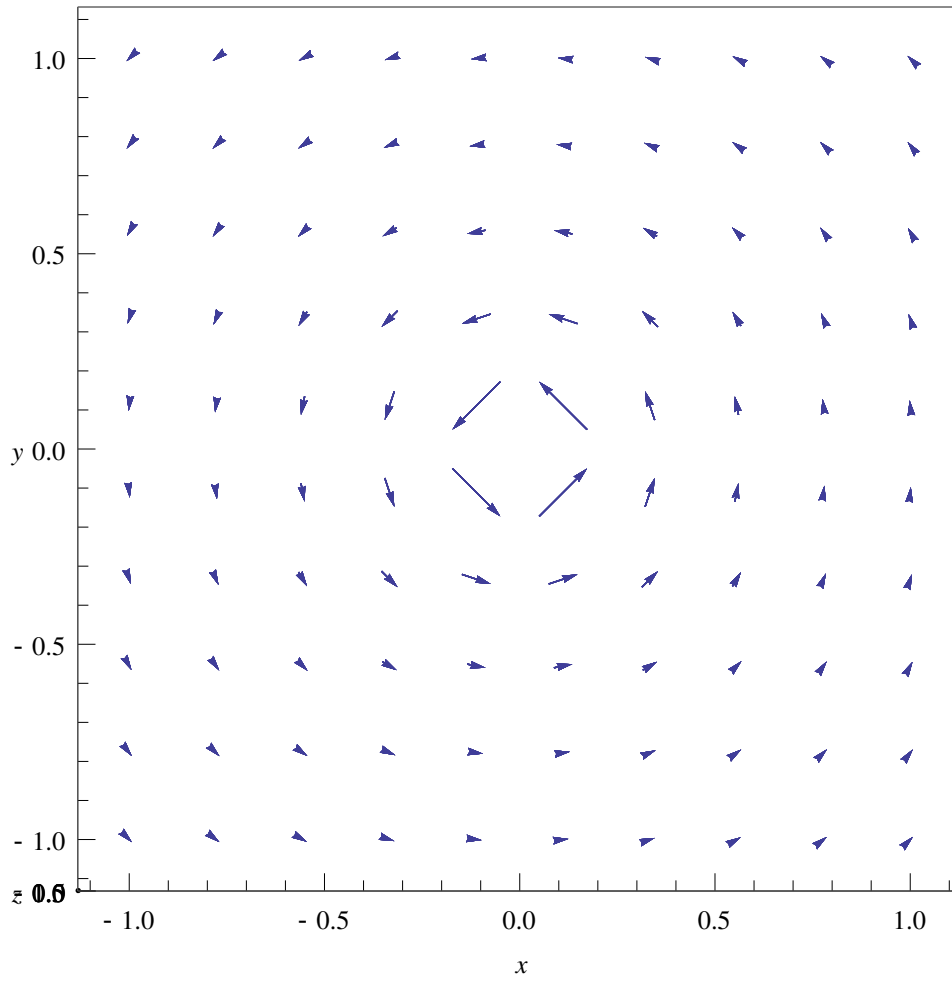
$$F_4$$



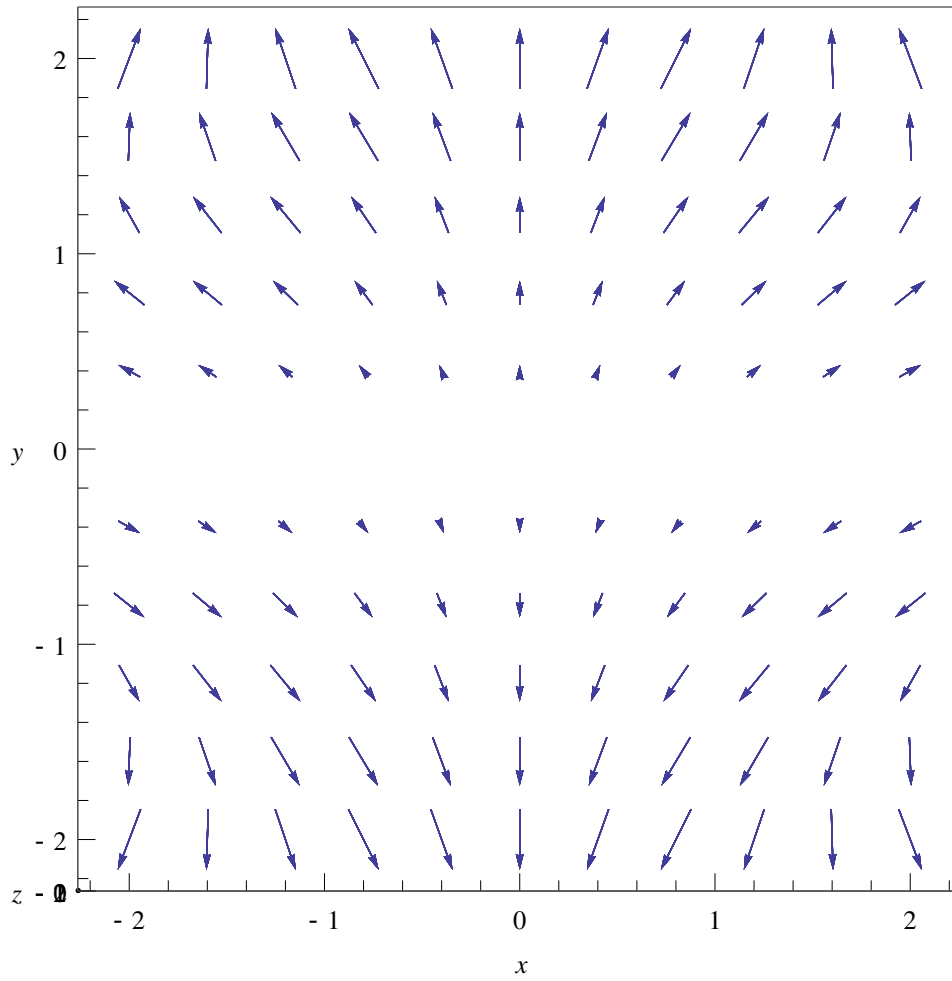
F_5



F_6



F_7



$$F_8$$

Solution For each vector field, draw a small box in each quadrant. Think about the flux of the vector field through the box. If the net flux is positive (more long arrows coming out of longer edges of the box), then the divergence is positive. Use boxes that are adapted to the symmetry of the vector fields, i.e. pineapple chunks for the radial and angular vector fields. Some of the boxes have long arrows on short edges and short arrows on long edges, so it is difficult to see what the net flux is. In fact, these graphs were chosen so that the divergence is zero.