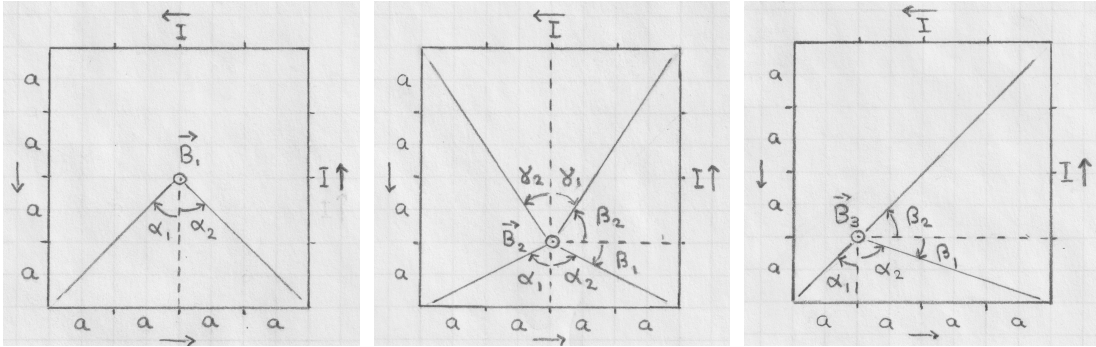


[lex60] Magnetic field of current in square-shaped wire

Consider a steady current I flowing counterclockwise in a square-shaped wire of side $4a$ as shown. It produces magnetic fields \mathbf{B}_1 , \mathbf{B}_2 , and \mathbf{B}_3 directed out of the plane at the three points identified graphically. Use the expression derived in [lex51] and apply it to all four sides of the square to determine the magnitudes B_1 , B_2 , and B_3 in units of $B_0 \doteq \mu_0 I / 4\pi a$.



Solution: