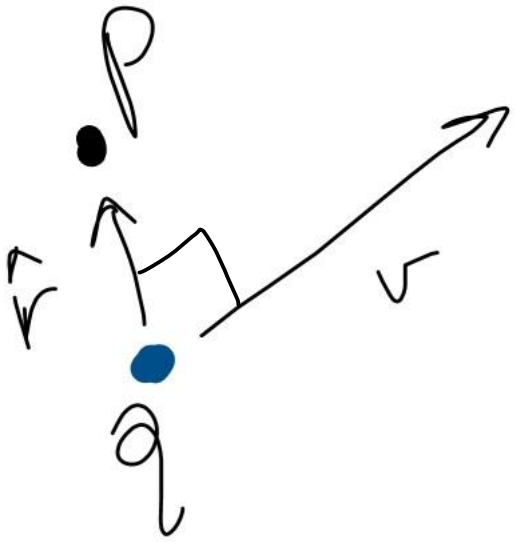
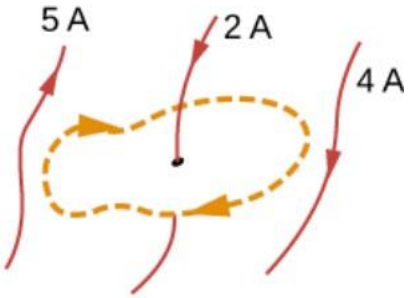
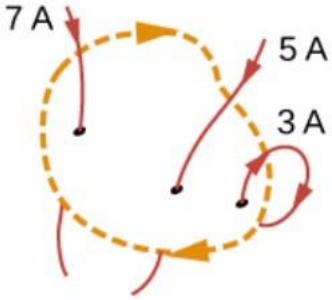
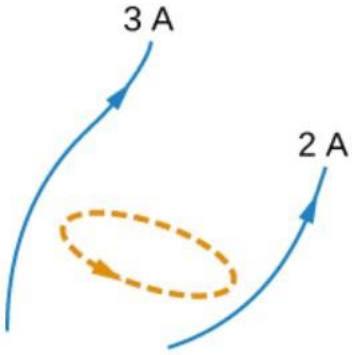
1) Draw the direction of the magnetic field at point P caused by the particle shown below. How far away is point P from the particle q if the magnitude of the B-field at this point is $B = 1\ mT$? Here the velocity is $v = 0.5\ m/s$ and the charge is $q = 1.7\ \mu C$. (Hint: Use the Biot-Savart Law)



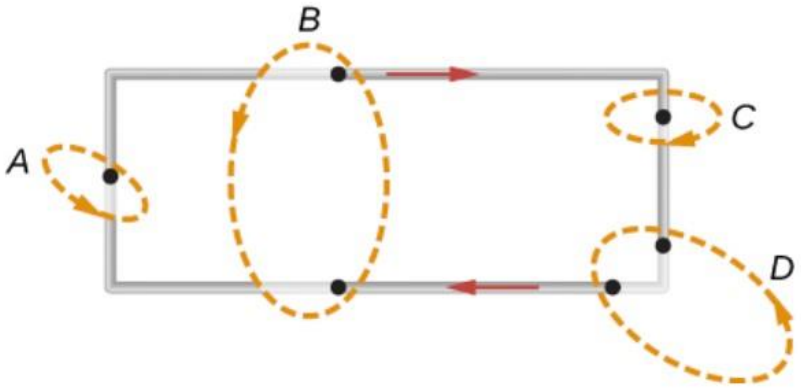
2) What is the total enclosed current in each of the following Amperian Loops?



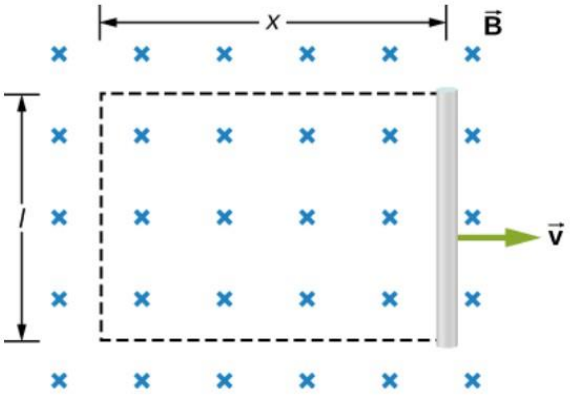


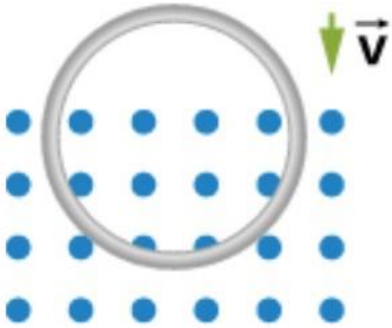


3) Calculate $\oint B \cdot dl$ for the loops A, B, C, and D. This wire that has current I is flowing through it. (Hint: Loop D is in the same plane as the wire.)

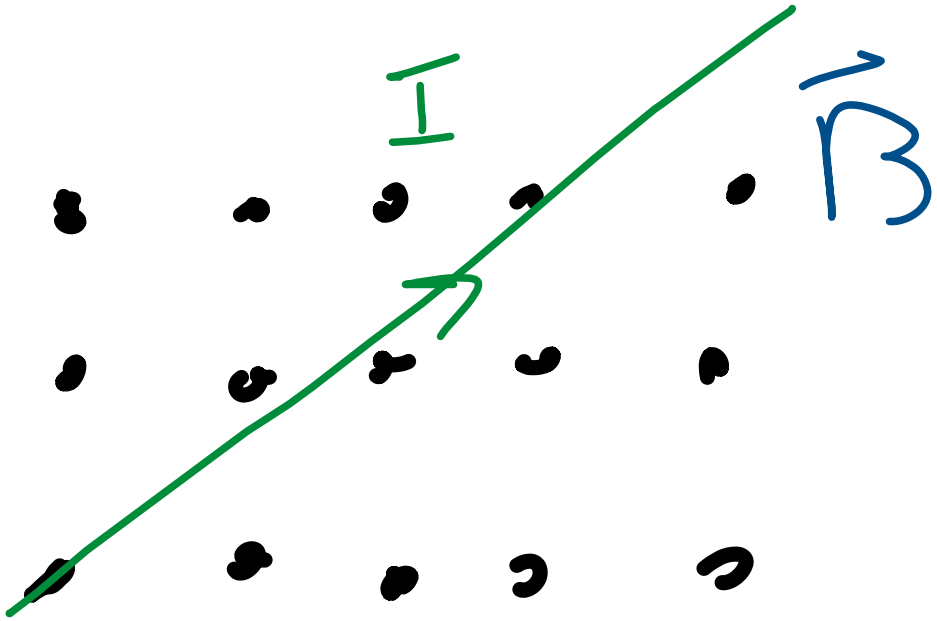


4) What is the direction of the induced current in the following loops of wire? Is the magnetic flux increasing or decreasing?





5) Suppose we have a wire in a uniform magnetic field with magnitude $B = 6\ \mu T$. What is the force on this wire per unit length? What is the direction of the force? The current is $I = 2.9\ A$.



6) The rod shown below moves to the right on an essentially zero-resistance rails at a speed of $v = 3\ m/s$ and tilted to an angle of $\theta = 30°$. What is the current induced through this resistor shown below when $R = 8\ \Omega$? The magnetic field is constant everywhere and equal to $B = 0.4\ T$ and the height of the rectangular loop is $l = 2\ cm$.