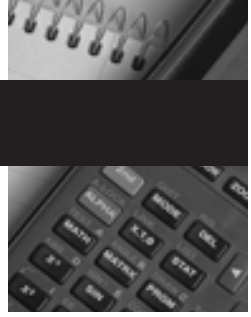

Magnetism

Magnets and Magnetic Fields, p. 109

1. a. No

b. No

c. Magnet: A; Iron: B and C.

2. Arrows should point away from S, toward N, building a composite picture of the magnetic field.

3. Arrows should point away from S, toward N, mostly in the area between the ends of the magnet and around it.

Magnetism from Electricity, p. 110

1. a. the field at A, B, C is pointing out (dot symbol); the field at D, E, F is pointing in (× symbol).

b. all reversed: the field at A, B, C is pointing in (× symbol); the field at D, E, F is pointing out (dot symbol)

2. the strength at point A is weaker than B, C, D or E, and about equal to that at F.

3. All directions of field are opposite to the answers in questions 1. The relative strengths remain the same.

Magnetic Force, p. 111

1. a. **v**-arrow to the right, **B**-arrow upward

b. •; $\mathbf{F} = 4.8 \times 10^{-14}$ N, upward, out of the page

c. 0

2. a. **v**-arrow to the left, **B**-arrow upward

b. ×; $\mathbf{F} = 4.8 \times 10^{-14}$ N, downward, into the page

c. 0

3. a. **v**-arrow to the right, **B**-arrow upward

b. •; $\mathbf{F} = 9.6 \times 10^{-14}$ N, upward, out of the page

c. 0

4. No. When the force is not zero, it acts perpendicular to velocity. They move in a circle perpendicular to the magnetic field.

III

Mixed Review, pp. 113–114

1. a. The magnetic field from the leftmost segment is • and stronger. The magnetic field from the rightmost segment is × and weaker.

b. At A, both horizontal segments contribute a × magnetic field of equal strength

c. B; ×; × weaker; ×; × same

C; ×; × same; ×; × same

D; ×; × stronger; ×; × same

E; ×; • stronger; ×; × same

d. No. They reinforce each other in the same direction.

e. inside

2. a. **F** = 4.3 N into the page

b. **F** = 0

3. a. Diagrams should show clockwise current.

b. Starting from the left side: **F** = 1.1 N into the page; **F** = 0; **F** = 1.1 N out of the page; **F** = 0

c. Forces are equal and opposite, so no translational motion will occur, but it could rotate around a vertical axis.