

## WORKSHEET – Magnetic Fields 1

1. A 0.25 m long wire is carrying a 1.25 A current [W] while the wire is perpendicular to a 0.35 T magnetic field directed to the north. What is the size and direction of the force acting on the wire?  
(0.11 N [D])
2. A 3.0 cm long wire lies perpendicular to a magnetic field with a magnetic induction of 0.40 T directed down. Calculate the size of the force acting on the wire if the current in the wire is 5.0 A and flowing to the east.  
(0.060 N [N])
3. What is the size and direction of the force that acts on a 3.5 m long wire that is carrying 12 A of current east if the wire is sitting perpendicular to the Earth's magnetic field knowing that the Earth's magnetic field is  $1.0 \times 10^{-4}$  T [N]?  
( $4.2 \times 10^{-3}$  N [U])
4. A wire, 0.50 m long, is put into a uniform magnetic field. The force exerted upon the wire when the current in the wire is 20 A is 3.0 N. What is the magnetic induction of the field acting upon the wire knowing that the current is flowing at right angles to the field?  
(0.30 T)
5. What is the size of the current running through a 35 cm long wire that is sitting perpendicular to a magnetic field of 0.085 T if the force acting on the wire is 125 mN?  
(4.2 A)
6. A wire 75 cm long carrying a current of 6.0 A is sitting at an angle of  $15^\circ$  with respect to a uniform magnetic field. The magnitude of the force acting on the wire is 0.60 N. What is the strength of the magnetic field?  
(0.51 T)
7. A copper wire 40 cm long carries a current of 6.0 A and weighs 0.35 N. A certain magnetic is strong enough to balance the force of gravity that acts on the wire. What is the strength of the magnetic field?  
(0.15 T)
8. A straight wire 0.10 m long carrying a current of 2.0 A is sitting at an angle of  $45^\circ$  to a magnetic field. The force acting on the wire is 0.04 N. What is the strength and direction of the magnetic field?  
(0.28 T)
9. A wire 0.50 m long carrying a current of 8.0 A is sitting at a  $30^\circ$  angle to a 0.40 T magnetic field. What is the magnitude of the force acting on this wire?  
(0.8 N)