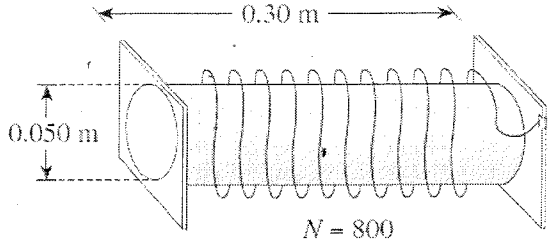
Physics 12 Review Section 20.8

1.

Consider the 800-turn solenoid shown in the diagram below.

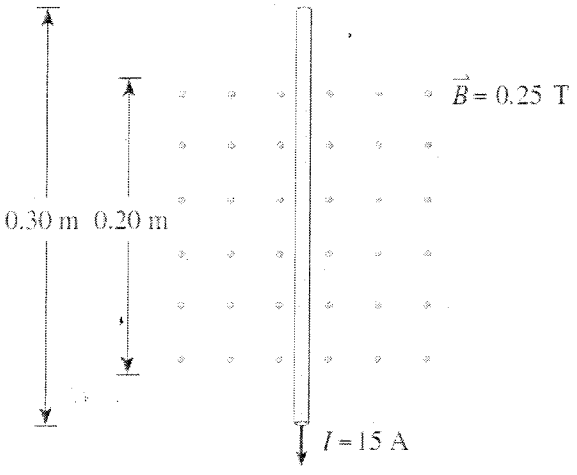


What is the current in the windings that would produce a magnetic field of 0.060 T at the centre of this solenoid?

A. 3.0 A
B. 8.0 A
C. 18 A
D. 290 A

2.

A conductor is placed in a magnetic field as shown.



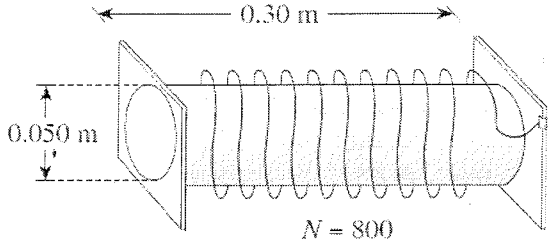
What are the magnitude and direction of the magnetic force acting on this conductor when it carries a 15 A current?

	Magnitude of Magnetic Force	Direction of Magnetic Force
A.	0.75 N	To the left
B.	0.75 N	To the right
C.	1.1 N	To the left
D.	1.1 N	To the right

Physics 12 Review Section 20.8

1.

Consider the 800-turn solenoid shown in the diagram below.



What is the current in the windings that would produce a magnetic field of 0.060 T at the centre of this solenoid?

$B = \mu_0 n I$

$= \mu_0 \frac{N}{\ell} I$

$\frac{0.060\,T \times 0.30\,m}{4\pi \times 10^{-7}\,\frac{T\,m}{A} \times 800} = I$

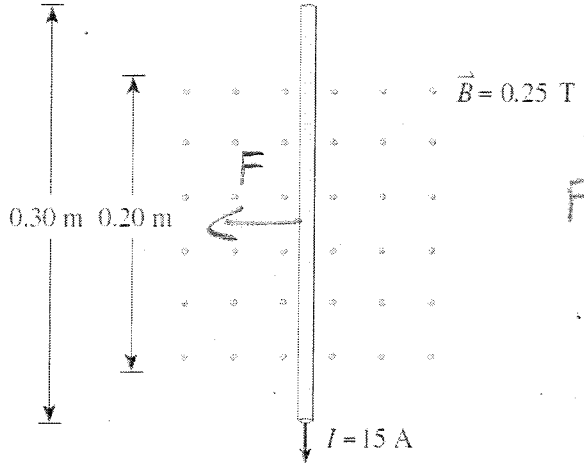
$17.90\,A$

A. 3.0 A
B. 8.0 A
C. 18 A
D. 290 A

$\frac{B\ell}{\mu_0 N} = I$

2.

A conductor is placed in a magnetic field as shown.



$F = BI\ell$

$= 0.25\,T \times 15\,A \times 0.20\,m$

$= 0.75\,N$

What are the magnitude and direction of the magnetic force acting on this conductor when it carries a 15 A current?

	Magnitude of Magnetic Force	Direction of Magnetic Force
A.	0.75 N	To the left
B.	0.75 N	To the right
C.	1.1 N	To the left
D.	1.1 N	To the right