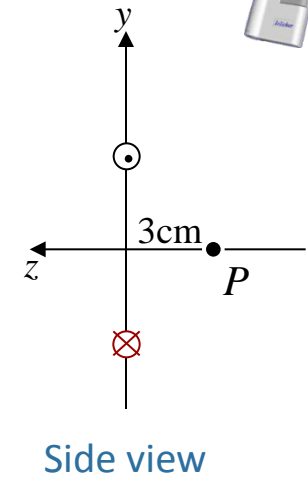
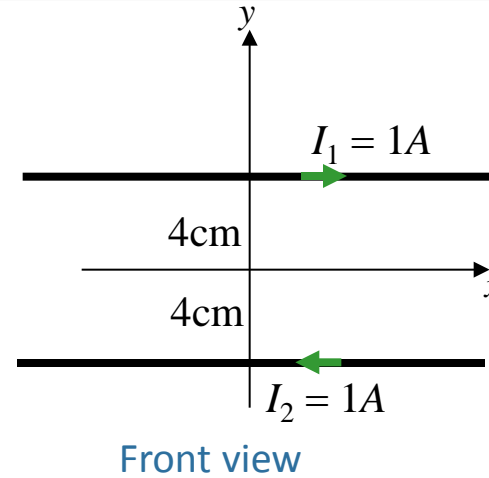


# Calculation



Two parallel horizontal wires are located in the vertical  $(x,y)$  plane as shown. Each wire carries a current of  $I = 1A$  flowing in the directions shown.



What is the  $B$  field at point  $P$ ?

$$B = \frac{\mu_0 I}{2\pi r}$$

What is the magnitude of  $B$  at  $P$  produced by the top current  $I_1$ ?

$$(\mu_0 = 4\pi \times 10^{-7} \text{ T}\cdot\text{m/A})$$

**A)  $4.0 \times 10^{-6} \text{ T}$**

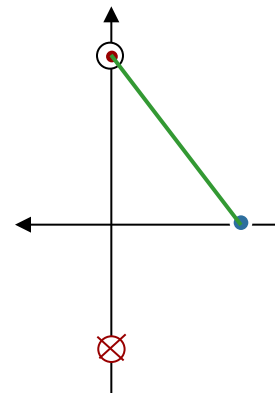
B)  $5.0 \times 10^{-6} \text{ T}$

C)  $6.7 \times 10^{-6} \text{ T}$

What is  $r$ ?

$r$  = distance from wire axis to  $P$

$$B = \frac{\mu_0 I}{2\pi r} = \frac{(4\pi \times 10^{-7}) \times 1}{2\pi r} = 40 \times 10^{-7}$$



$$r = \sqrt{3^2 + 4^2} = 5 \text{ cm}$$