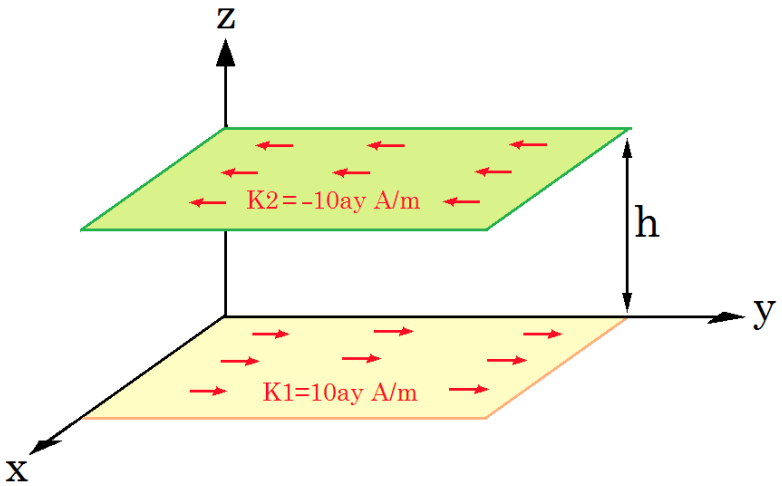
(Examples on the magnetic field of sheet of current)

Example1: A two sheets of current , the first of K1=10 ay (A/m) at Z=0, and the second of K2=-10ay (A/m) at Z=h, find the magnetic field intensity at all points?

Solution: as shown in the figure:



1) For P1(apoint at a region of Z > h)

H1=(1/2) K1 × aN =0.5(10ay)× (az)= 5ax (A/m)

H2=(1/2) K2 × aN =0.5(-10ay)× (az)= -5ax (A/m)

H(p1)=H1+H2= 5ax – 5ax

H(p1) = 0 (A/m)

2) For P2(apoint at a region of 0 < z < h)

H1=(1/2) K1 × aN =0.5(10ay)× (az)= 5ax (A/m)

H2=(1/2) K2 × aN =0.5(-10ay)× (-az)= 5ax (A/m)

H(p2)=H1+H2= 5ax + 5ax

H(p2) = 10 ax (A/m)

3) For P3 (apoint at a region of Z < h)

H1=(1/2) K1 × aN =0.5(10ay)× (-az)= -5ax (A/m)

H2=(1/2) K2 × aN =0.5(-10ay)× (-az)= 5ax (A/m)

H(p3)=H1+H2= -5ax + 5ax

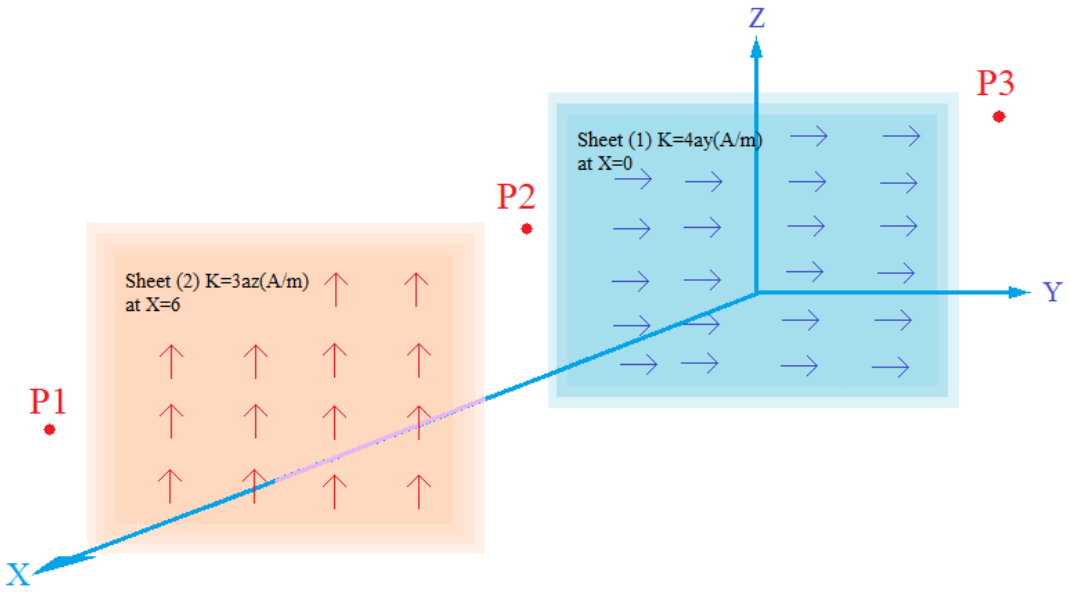
H(p3) = 0 (A/m)

❖ طالما ان لوحي التيار متوازيان ويحملان نفس كثافة التيارلكن متعاكسان فان المجال المغناطيسي بينهما يتضاعف , وخارجهما يكون صفرا.

(Examples on the magnetic field of sheet of current)

Example2: A two sheets of current , the first of K=4ay (A/m) at X=0, and the second of K=3az (A/m) at X=6, find the magnetic field intensity at all points?

Solution:



4) We select P1 at any point in region of X > 6 as shown in the figure:

H1=(1/2) K1 × aN =0.5(4ay)× (ax)= -2az (A/m)

H2=(1/2) K2 × aN =0.5(3az)× (ax)= 1.5ay (A/m)

H(p1)=H1+H2

H(p1) =1.5ay -2az (A/m)

5) We select P2 at any point in region of 6 > X > 0 as shown in the figure:

H1=(1/2) K1 × aN =0.5(4ay)× (ax)= -2az (A/m)

H2=(1/2) K2 × aN =0.5(3az)× (-ax)= -1.5ay (A/m)

H(p2)=H1+H2

H(p2) =-1.5ay -2az (A/m)

3) We select P3 at any point in region of 0 > X as shown in the figure:

H1=(1/2) K1 × aN =0.5(4ay)× (-ax)= 2az (A/m)

H2=(1/2) K2 × aN =0.5(3az)× (-ax)= -1.5ay (A/m)

H(p3)=H1+H2

H(p3) =-1.5ay +2az (A/m)