4B 5-5-14 MAIN

73 scantron

5

$$Q = Q_{MAX} \cdot \left(1 - e^{-t/RC}\right)$$

IF $t/RC << 1$

$$e^{-t/RC} \approx 1 - \frac{t}{RC}$$

$$Q = Q_{MAX} \cdot \frac{t}{RC}$$

FINAL EXAM PROBLEM!

BUT ONLY IF $t/RC << 1$.

T3 Score: MAINSCORE + 28 + 12

MAINSCORE = 204

28 ↑ T3 FOLLOW

12 ↑ T3 Scantron

244 = MAXIMUM + E.C.

T4 = MAY 16th : CH 28, 29, 30 (E.C.)

Test 9 LINKS

M

CH 28

LINKS:

DATES:

3-24
3-28
4-21
4-25
4-9

} 2014

Ch. 29

LINKS:

3-24, 4-23, 4-28 — 2014.

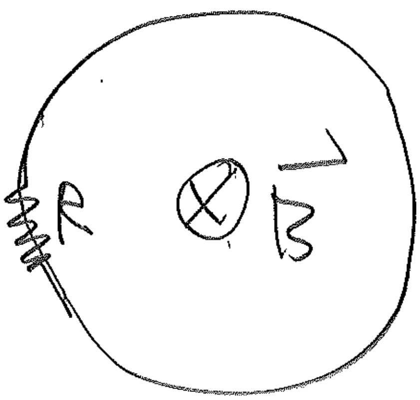
Work on problems

Sec 29.2, 29.3

6, 8, 52

CH 29

(6.)



$R = 600\,\Omega$

Assume $\vec{B}$ points in and $|\vec{B}| = \alpha \cdot t + \beta t^4$.

(pertinent questions)

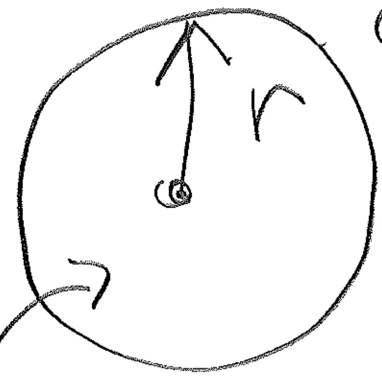
Question 1:

Is $|\vec{B}|$ increasing or decreasing?

Question 2: $|\mathcal{E}| = N \cdot \left| \frac{d\Phi_B}{dt} \right|$

$\Phi_B = B \cdot A$ and $N = 1$.

Question 3:



circle of radius r.

A = ?

HINT: a circle.

Note: $|\varepsilon| = A \cdot \left|\frac{dB}{dt}\right|$

A = CONSTANT.

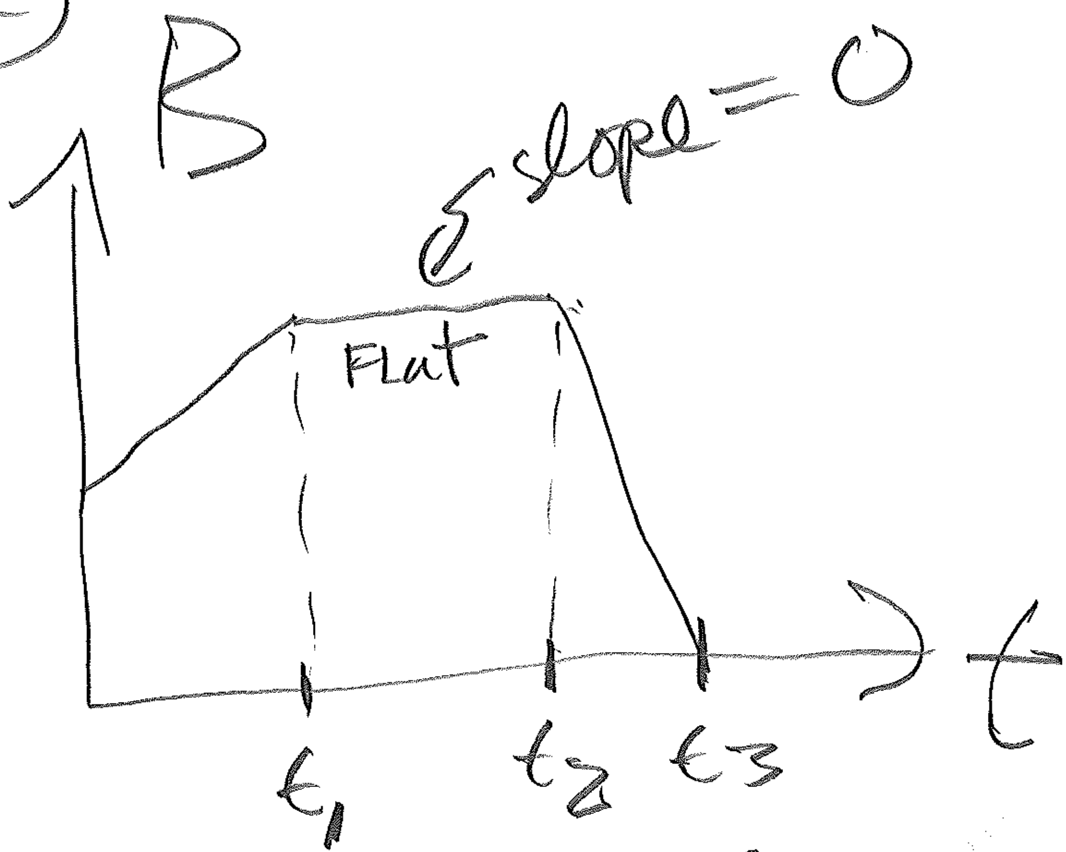
CH 25, 26: $I = \frac{|\varepsilon|}{R}$

TO DO: FIND direction of I and $\vec{B}_{IND}$. ← in OR OUT

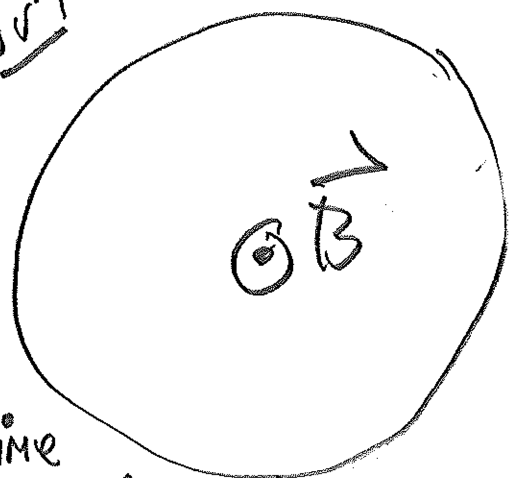
↑ CW OR CCW (see FARADAY'S LAW notes)

CH 29 review for test

(52)



ASSUME $\vec{B}$ is OUT



CIRCULAR area in plane

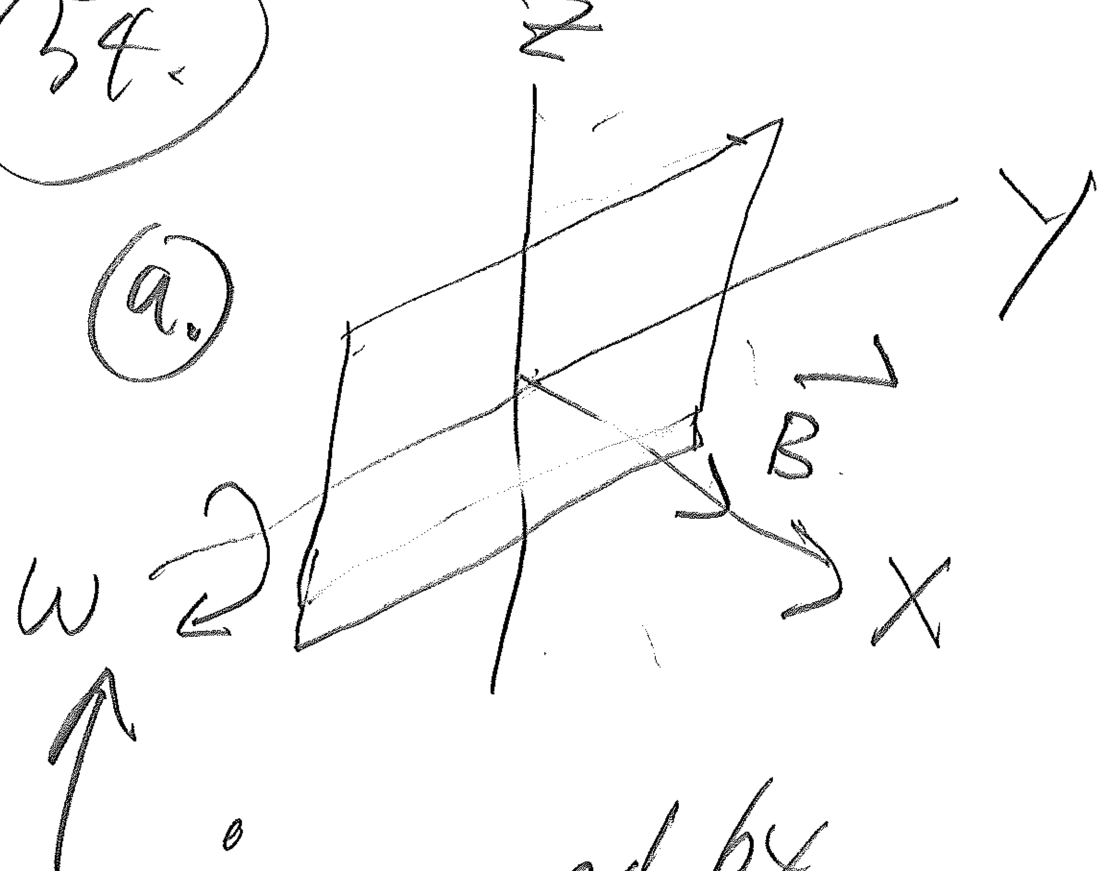
time intervals	$\lvert\vec{B}\rvert$ INC. OR DEC.	I [CW OR CCW]	$\vec{B}_{IND}$ OUT OR IN
$0 - t_1$	DEC. OR INC	↺ OR ↻	⊙ OR IN
$t_1 - t_2$	" " "	" " "	
$t_2 - t_3$	" " "	" " "	

Fill in table

GENERATOR (6

(54.)

(a.)

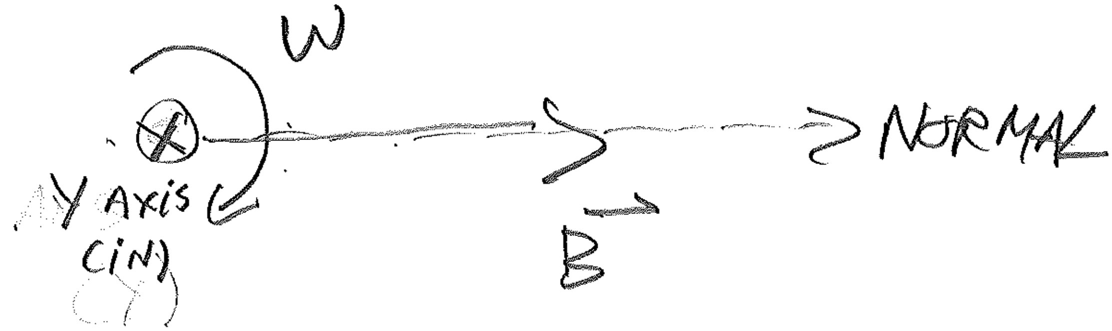


ROTATION caused by mechanical action like water turning a turbine or steam turning blades to rotate; or wind power.

(a) <u>side view</u>

O top (T)

(a.)



O bottom (bot)

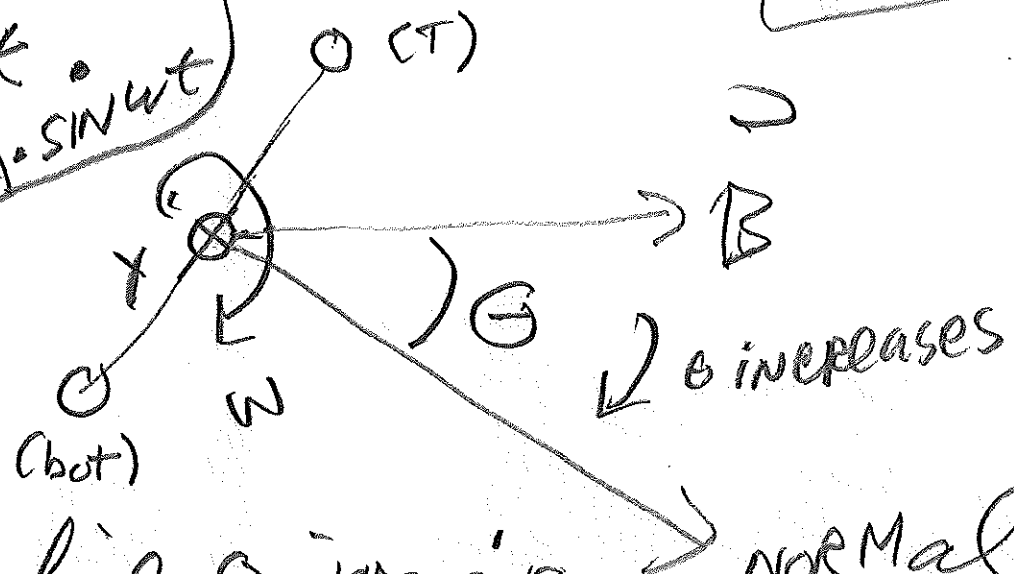
$\Phi_B = B \cdot A \cos\theta$

$\Phi_B = BA\cos \omega t$

* $\mathcal{E} = \omega BA \sin \omega t$

* $\mathcal{E} = -\dfrac{d\Phi_B}{dt}$

$\mathcal{E} = \omega BA \cdot \sin \omega t$



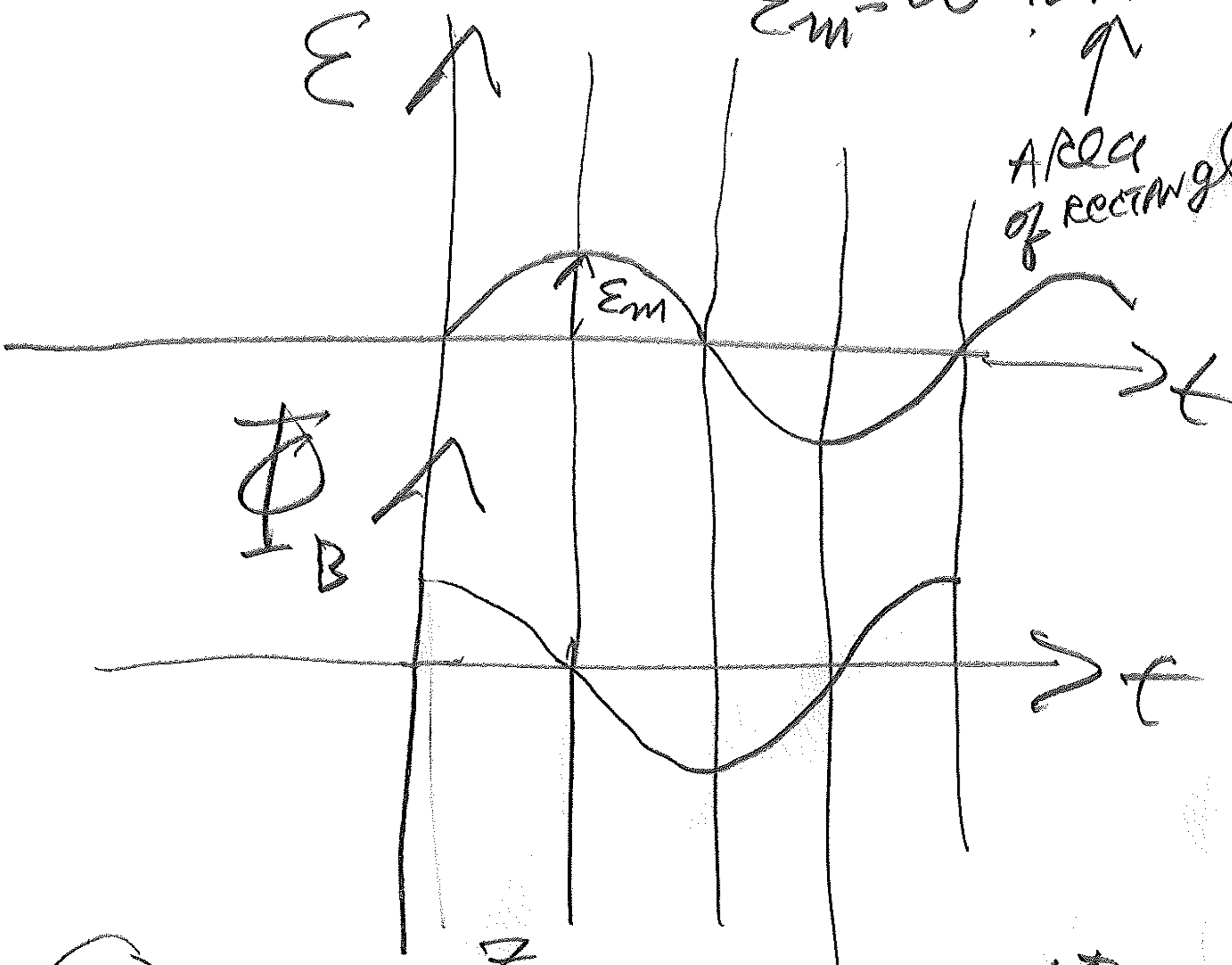
define θ increasing clockwise to get SAME picture as 4-28-14.

(a.) $|\mathcal{E}| = \omega B A \sin \omega t$

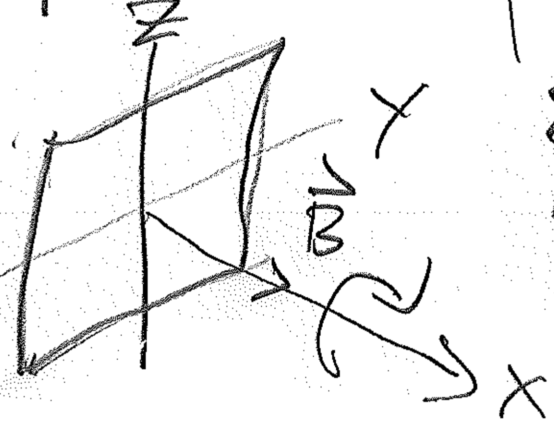
$= \mathcal{E}_m \cdot \sin \omega t$

$\mathcal{E}_m = \omega \cdot B \cdot A$

Area of rectangle



(b.)



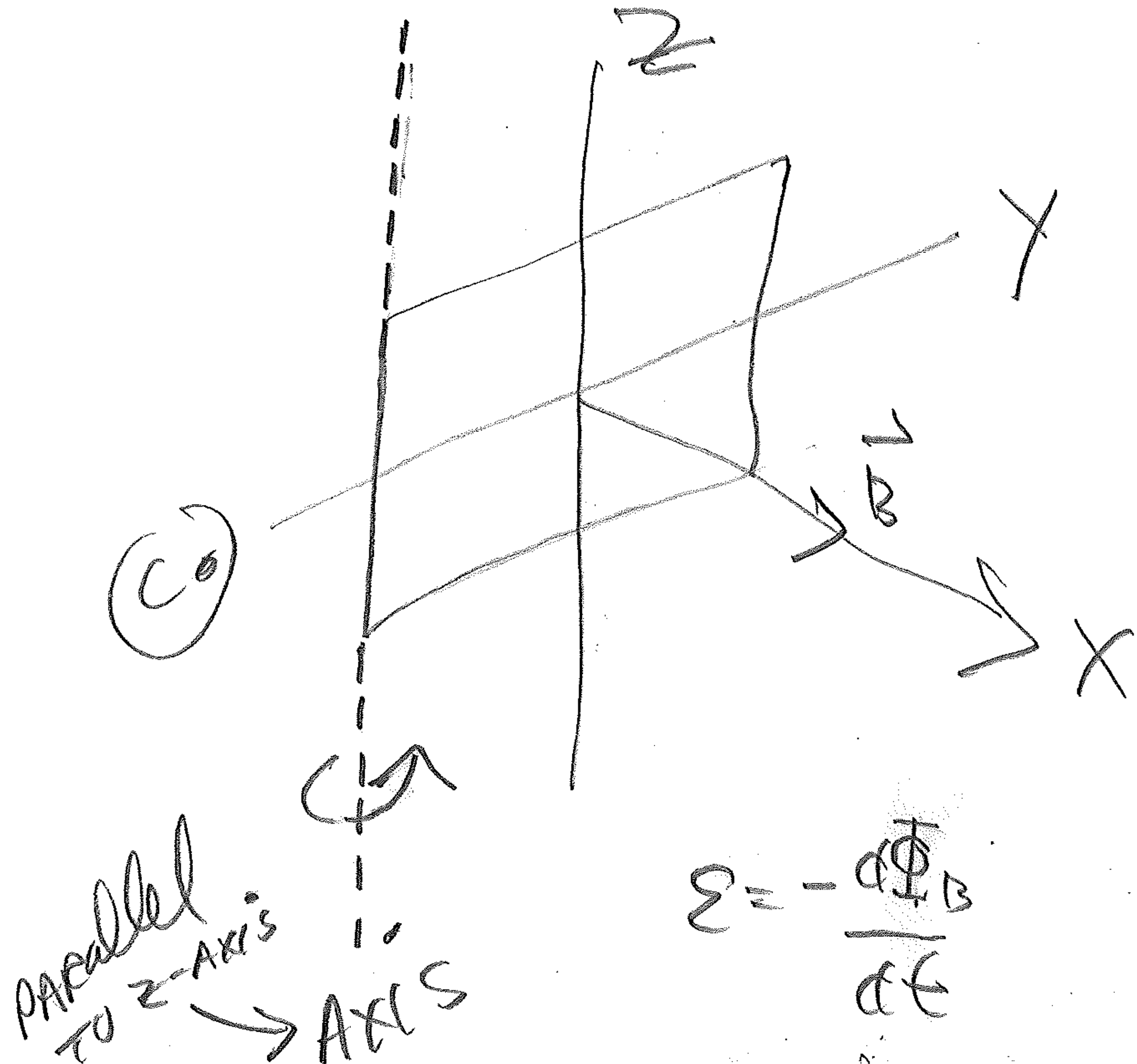
$\Phi_B = B \cdot A \cdot \cos\theta$

$\mathcal{E} = -\frac{d\Phi_B}{dt} = ?$

if $\theta = 0$

$= \text{constant}?$

(9

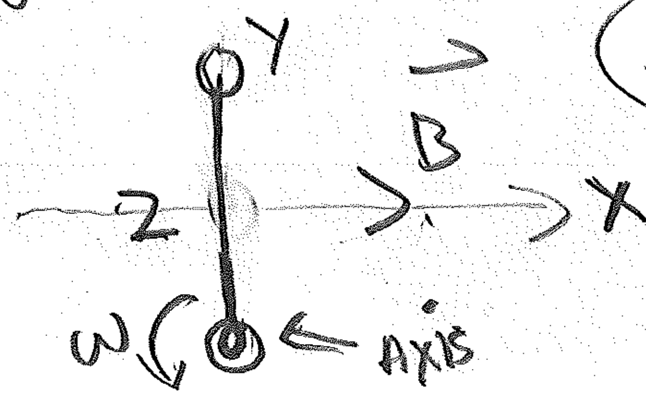


$$\mathcal{E} = -\frac{d\Phi_B}{dt}$$

$$\Phi_B = B \cdot A \cos\theta$$

view along Z Axis:

$\Phi_B = BA\cos\theta$



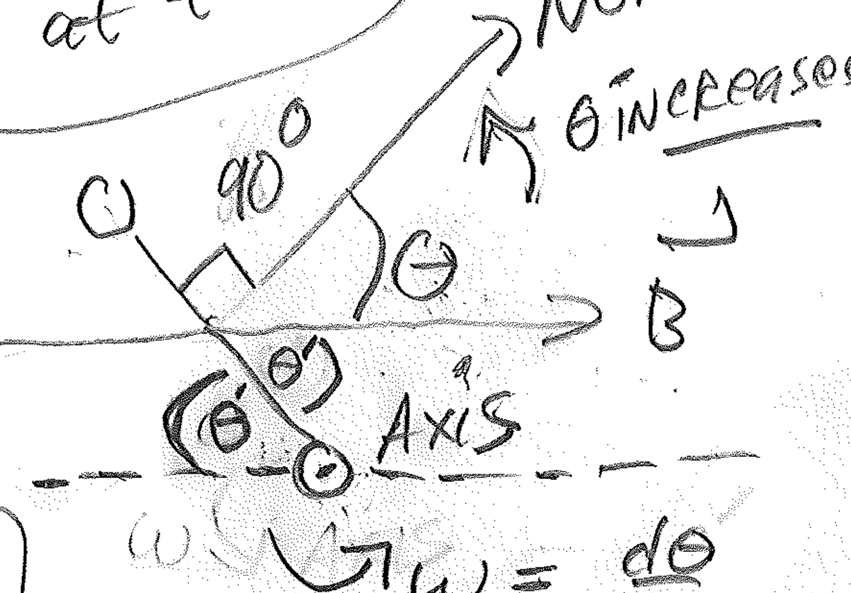
$\mathcal{E} = 0$, $\theta = 0$

$\Phi_B = B \cdot A$

$\cos 0 = 1$

(c.)

at $t=0$



$$\theta' = \frac{\pi}{2} - \theta$$

$$d\theta'/dt = -d\theta/dt$$

$$\mathcal{E} = \omega B A \sin \omega t$$

$$\Phi_B = B \cdot A \cdot \cos\theta$$

$$\mathcal{E}_m = \omega B A$$

$$\mathcal{E} = -\frac{d\Phi_B}{dt} = \omega B A \sin\theta$$

$$\theta = \omega t$$

$$\frac{d\theta}{dt} = \frac{d\omega}{dt} \text{ ? (yes) !}$$

$$\frac{d\theta'}{dt} = -\omega \implies \frac{d\theta}{dt} = +\omega$$

(c.) $\Phi_B = BA \cdot \cos \omega t$

just like part (a.)

$$\mathcal{E} = -\frac{d\Phi_B}{dt}$$

$$= \omega B \cdot A \sin \omega t$$

(same as (a.))

$$\mathcal{E}_m = \omega B \cdot A$$