







love you











$$P_{\text{diss}} = I^2 R = \frac{V^2}{R}$$

Rea

Rep

→

R1

+

R2

+

R3

+

...

$$\frac{1}{R_{eq}} = \frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3} + \dots$$

R1

R2

R3





R_1 V

 $R_1 + R_2$



R_2 V

 $R_1 + R_2$



R_2

1

R_1

+

R_2



$$R_1$$

$$1$$

$$R_1$$

$$+$$

$$R_2$$



Pr1













Σ v_i $=$ 0

loop



Σ

$$I_i = 0$$

junction























$$X_C = - \frac{j}{\omega C}$$







$$\operatorname{Re}(v e^{j(wt + \phi_v)}) = v \cos(wt + \phi_v)$$



$$\operatorname{Re}(e^{j\omega t + \phi_i}) = \cos(\omega t + \phi_i)$$









vejo





Revised 1st

Realized
growth

I

=

V

—

Z

PLEASE VISIT www.dodgson.com

$$\langle P \rangle = \frac{N}{2} \cos(\phi_v - \phi_i) = \frac{\sqrt{2}}{2} \cos(\phi_v - \phi_i)$$

cos²(wt)









winning 1200



$$v_{out} = \frac{Z_2}{Z_1 + Z_2} v_{in}$$

v

out

$$V_{out} = \sqrt{V_{out} * V_{out}}$$



$$\tan \phi = \frac{\operatorname{Im} \left(\frac{Z_2}{Z_1 + Z_2} \right)}{\operatorname{Re} \left(\frac{Z_2}{Z_1 + Z_2} \right)}$$



$$A_v = \frac{V_{out}}{V_{in}} = \frac{|V_{out}|}{|V_{in}|} = \left| \frac{Z_2}{Z_1 + Z_2} \right| = \sqrt{\left(\frac{Z_2}{Z_1 + Z_2} \right)^* \left(\frac{Z_2}{Z_1 + Z_2} \right)}$$



A_v

$=$

$\frac{1}{\sqrt{2}}$



$$Z_1 = j \left(\omega L - \frac{1}{\omega C} \right)$$

$$\frac{V_{out}}{V_{in}} = \sqrt{\frac{R^2}{R^2 + (\omega L - 1/\omega C)^2}}$$



$$\frac{Z_2}{Z_1 + Z_2} = \frac{R}{R + j\left(\omega L - \frac{1}{\omega C}\right)} = \frac{R^2 - jR\left(\omega L - \frac{1}{\omega C}\right)}{R^2 + \left(\omega L - \frac{1}{\omega C}\right)^2}$$

$$\tan \phi = \frac{\frac{1}{\omega C} - \omega L}{R}$$

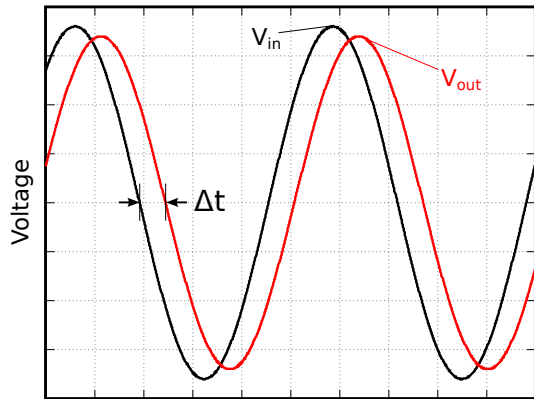
Vote for
the

Went to

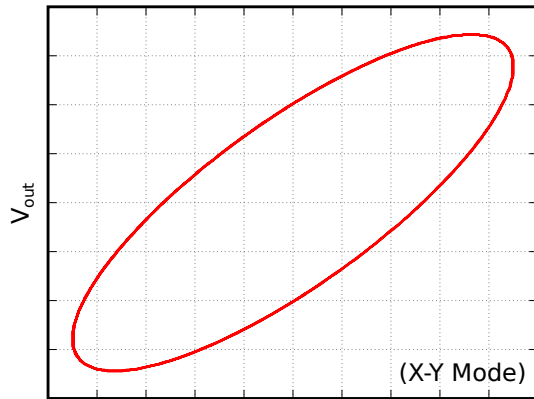


$$\Delta t = \frac{\phi}{\omega} = \frac{\phi}{2\pi f} = \frac{\phi}{2\pi} T$$

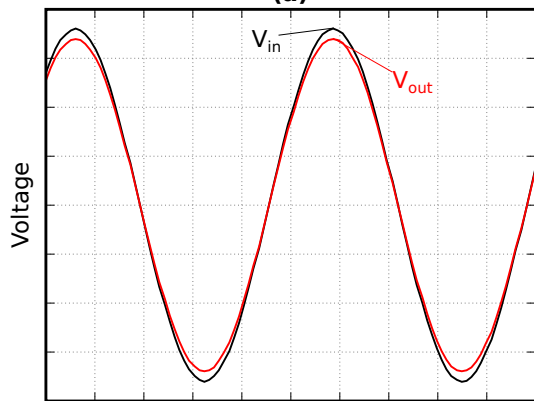




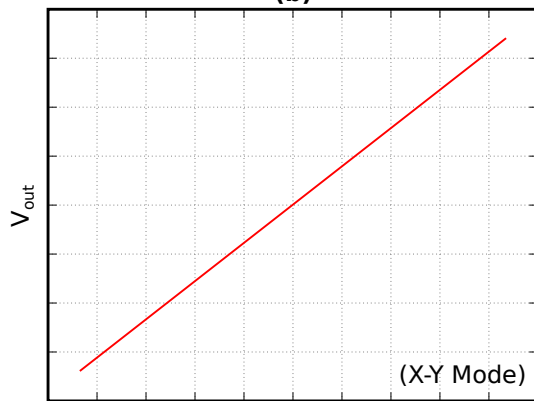
Time
(a)



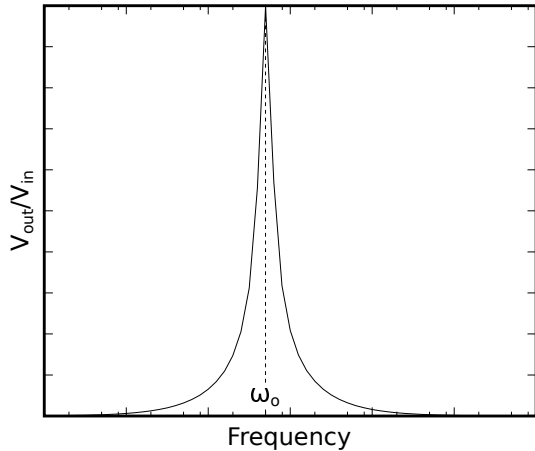
V_{in}
(b)



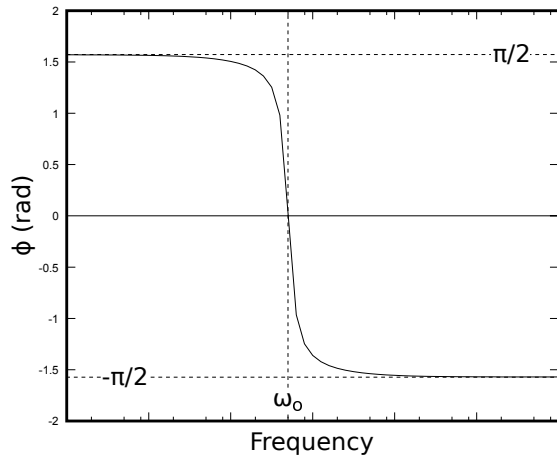
Time
(c)



V_{in}
(d)



(a)



(b)

love

—

win





$$\omega_0 = \frac{1}{\sqrt{LC}}$$

love



A

v

=

v

o

v

t

/

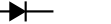
v

n











WBE

$$I_C = I_0 \left(e^{\frac{V_{BE}}{kT/e}} - 1 \right)$$





130x10-22





$$r_e = \frac{dV_{BE}}{dI_C} = \frac{kT/e}{I_C}$$

2522/2021

VE

WE

SE

0.

25





10

11

12

13





VERSES

10

11

12

13

h

FE

se

100

VERGE OF



re=2522/2522











A pixelated, black and white graphic of the text "100% for 2". The characters are rendered in a thick, blocky, and slightly irregular font, reminiscent of early digital art or video game text. The "1" is a simple vertical bar with a horizontal top. The "0" is a circle with a thick border. The "00" is followed by a percentage sign "%". The word "for" is in a similar blocky style, with the "o" being a circle. The "2" is also blocky, with a horizontal base and a curved top. The entire text is set against a white background.







AR 12

VB

es

VE

+

0

.

0

W

APPAREL

Q1



$$A_v = -\frac{R_C}{R_E}$$













AR1|AR2|AR3|AR4|AR5|AR6|AR7|AR8|AR9|AR10

R1

||

R2

REPAIR + REPAIR



A pixelated, black and white graphic of the letters 'VSE' in a stylized, blocky font. The letters are composed of a grid of black and gray pixels on a white background, giving them a digital or retro aesthetic. The 'V' is on the left, the 'S' is in the middle, and the 'E' is on the right. The overall style is reminiscent of early computer graphics or video game sprites.

A pixelated, black and white graphic of the letters 'V' and 'S'. The 'V' is on the left, and the 'S' is on the right. The letters are composed of a grid of black and white pixels, giving them a jagged, digital appearance. The 'V' is formed by a vertical stroke on the left and a diagonal stroke on the right. The 'S' is formed by a horizontal stroke at the top, a curved stroke in the middle, and a horizontal stroke at the bottom. The overall style is reminiscent of early computer graphics or video game sprites.



A pixelated, black and white graphic of the letters 'SE' in a stylized, blocky font. The letters are composed of a grid of black and white pixels, giving them a digital or retro aesthetic. The 'S' is on the left and the 'E' is on the right. The background is white.







Power

—

0



103

105



Run = 0, A = 0, R = 0

vs + = vs = vs

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

1

0

1

2

2



$$1 = \frac{V_{in}}{R_1} = \frac{-V_{out}}{R_f}$$

$$A_v = -\frac{R_f}{R_1}$$

ROZ

||

RF

Rece



$$V_{in} = \frac{R_1}{R_1 + R_f} V_{out}$$

$$A_v = 1 + \frac{R_f}{R_1}$$

Real + Real







V1

R1

V2

R2



V3

R3



V_{out}



R_f



$$V_{out} = - \left(\frac{R_1}{R_f} V_1 + \frac{R_2}{R_f} V_2 + \frac{R_3}{R_f} V_3 \right)$$

Pr

Pr



V_1

—

V_2

R_1

V_2

$-$

V_+

R_1

$$V_L - V_{out}$$

$$R_2$$



V

+

—

R₂

$$V_+ = \frac{R_2}{R_1 + R_2} V_2$$



$$v_{out} = -\frac{R_2}{R_1} (v_1 - v_2)$$









W

out

—

—

R

$$V_{in} = \frac{Q}{C}$$

1

=

$\frac{dQ}{dt}$

$$V_{out} = -RC \frac{dV_{in}}{dt}$$



I

$=$

$$\frac{V_{in}}{R}$$

$$V_{out} = -\frac{Q}{C}$$

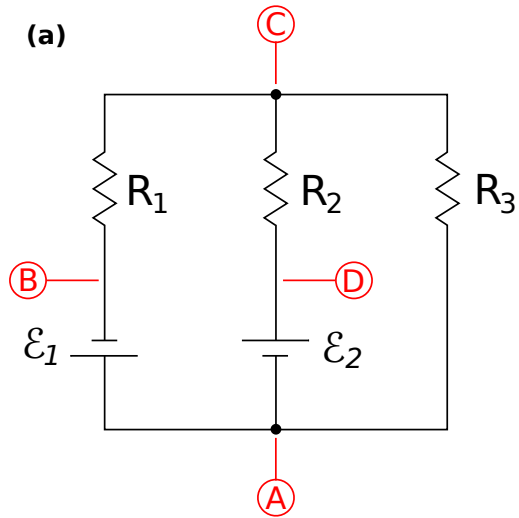


$$Q = \int dq = \frac{1}{R} \int v_{in} dt$$

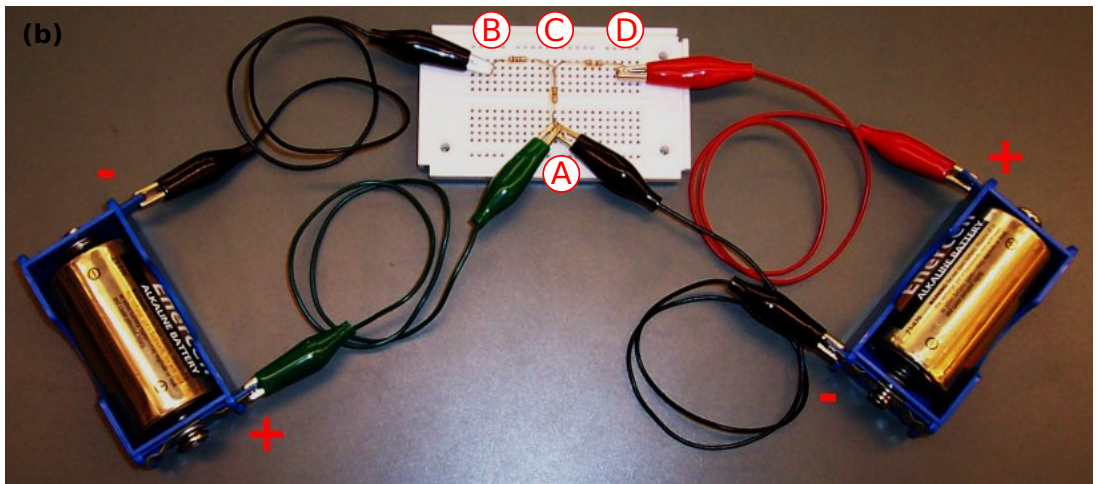
$$V_{out} = -\frac{1}{RC} \int V_{in} dt$$



(a)



(b)



color	black	brown	red	orange	yellow	green	blue	violet	gray	white
digit	0	1	2	3	4	5	6	7	8	9
multiplier	1	10	100	1k	10k	100k	1M	10M	100M	1000M

$$R = [\text{band1}][\text{band2}] \times 10^{[\text{band3}]} \quad \begin{array}{l} \pm 5\% \text{ (gold)} \\ \pm 10\% \text{ (silver)} \end{array}$$

$$A \equiv 64 \times 10^2 \quad 2 \equiv 64 \times 100 \quad 2 \equiv 6400 \quad 2$$

13202

T n n n n e 1

T H N E S

$$dB = 10 \log \left(\frac{\text{Thing}_2}{\text{Thing}_1} \right)$$

Thinner

100

Thinning 1

1

0

—

1

2



$$10 \log \left(\frac{P_{out}}{P_{in}} \right) = 10 \log \left(\frac{1}{2} \right) = 10(-0.3010) = -3.01$$



100%



100%



1

2

3

4