# Elektriske kredsløb

Af Jesper Bertelsen, AU-ID: au689481@uni.au.dk

Indholdsfortegnelse

[Formler brugt 3](#_Toc123140645)

[Kapitel 1 - Introduktion 4](#_Toc123140646)

[Opgave 1.1 - Express using prefixs, no more than three digits. 4](#_Toc123140647)

[1. 1,000,000 Hz 4](#_Toc123140648)

[2. 4](#_Toc123140649)

[3. 4](#_Toc123140650)

[4. 4](#_Toc123140651)

[Opgave 1.7 - The net positive charge is . Find the current. 4](#_Toc123140652)

[Opgave 1.21 - Two eletrical devices are connected. Find the power transferred and state whether the power is transferred from A to B or B to A. 4](#_Toc123140653)

[1. 4](#_Toc123140654)

[2. 4](#_Toc123140655)

[3. 5](#_Toc123140656)

[4. 5](#_Toc123140657)

[Kapitel 2 - Basic circuit analysis 5](#_Toc123140658)

[Opgave 2.1 - The current through a resistor is 2,2 mA. Find the voltage across the resistor. 5](#_Toc123140659)

[Opgave 2.5 - Find 5](#_Toc123140660)

[Opgave 2.11 - i / v relationship is given as % 6](#_Toc123140661)

[1. Use this to find p & i for 6](#_Toc123140662)

[2. Is the diode linear or nonlinear, bilateral or nonbilateral. 6](#_Toc123140663)

[Opgave 2.15 - For the circuit 6](#_Toc123140664)

[1. Identify the nodes at least and at least two loops 6](#_Toc123140665)

[2. Identify any elements connected in series or in parallel 6](#_Toc123140666)

[3. Write KCL and KVL connection equations for the circuit 6](#_Toc123140667)

[Opgave 2.21 - 7](#_Toc123140668)

[Opgave 2.22 - . Find . 7](#_Toc123140669)

[Opgave 2.23 - Assign voltage variables. 8](#_Toc123140670)

[1. Use the passive sign convention, assign voltage variables. Write three KVL connection equations using these voltage variables. 8](#_Toc123140671)

[2. If , what can be said about the voltage across all the other elements. 8](#_Toc123140672)

[Opgave 2.25 - Find . 8](#_Toc123140673)

[8](#_Toc123140674)

[Opgave 2.26 - Find 8](#_Toc123140675)

[Opgave 2.29 - Find 9](#_Toc123140676)

[Opgave 2.30 9](#_Toc123140677)

## Formler brugt

Strøm

Spænding

Effekt

**K**irchhoffs **C**urrent **L**aw

Summen af alle strømme ind og fra et punkt er 0.

**K**irchhoffs **V**oltage **L**aw

Summen af alle spændinger i en maske er lige med 0.

Erstatningsmodstande:

Findes på side 43:

## Kapitel 1 - Introduktion

### Opgave 1.1 - Express using prefixs, no more than three digits.

#### 1,000,000 Hz

#### 

103GW

#### 

3,33

#### 

### Opgave 1.7 - The net positive charge is . Find the current.

Hvis *t* er i sekunder så medføre det.

### Opgave 1.21 - Two eletrical devices are connected. Find the power transferred and state whether the power is transferred from A to B or B to A.



#### 

*A til B*

Fra A til B afgiver A effekt.

*B til A*

Her går strømmen mod dens retning. Fortegnet ændres på strømmen.

Fra B til A modtager B effekt.

#### 

*A til B*

*B til A*

#### 

*A til B*

*B til A*

#### 

*A til B*

*B til A*

## Kapitel 2 - Basic circuit analysis

### Opgave 2.1 - The current through a resistor is 2,2 mA. Find the voltage across the resistor.

Omhs lov:

=================

=================

### Opgave 2.5 - Find



*Ligningen løses for R\_x vha. WordMat.*

### Opgave 2.11 - i / v relationship is given as %

#### Use this to find p & i for

Et billede, der indeholder bord

Automatisk genereret beskrivelse

#### Is the diode linear or nonlinear, bilateral or nonbilateral.

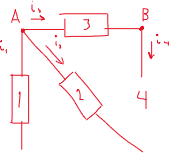
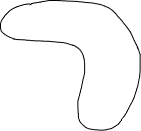
### Opgave 2.15 - For the circuit

#### Identify the nodes at least and at least two loops

#### Identify any elements connected in series or in parallel

#### Write KCL and KVL connection equations for the circuit

KCL:



Node A:



Node B:



KVL:

Maske A:

Maske B:

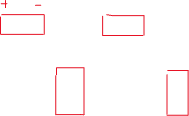
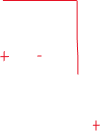
Det var noget lignende, som jeg løste i Maple. VPN til skolen virker ikke nu så jeg kan ikke bruge Maple.

### Opgave 2.21 -

KVL:



Maske A:



Maske B:

Maske C:



====================



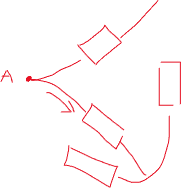
====================

### Opgave 2.22 - . Find .

KCL:

Node A: Node B:

Node C:



=========================



=========================



### Opgave 2.23 - Assign voltage variables.

#### Use the passive sign convention, assign voltage variables. Write three KVL connection equations using these voltage variables.

Maske A:

Maske B:

Maske C:

#### If , what can be said about the voltage across all the other elements.

Spænding i punkterne:

Maske B:

Maske A:



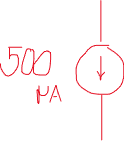
Maske A:

Maske C:



### Opgave 2.25 - Find .

### 



Strømmen i serie er den samme.

Her med modsat retning

Nu ohms lov

Wordmat virker ikke



### Opgave 2.26 - Find

Her kunne en spændingdeler bruges, men



erstatningsmodstanden findes i stedet for.



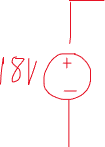
Strømmen vil da være den samme.



==================



==================



### Opgave 2.29 - Find



KCL



Node A =

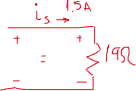


Strømmen der kommer ind må da

kunne beskrives som

Hvis vi laver erstatningsmodstand fra den parallelmodstande &

serieforbindelsen så fås kredsløbet.



Så kan beskrives som

======

======

### Opgave 2.30

### 