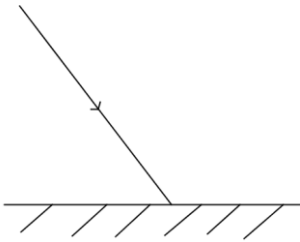


## Cahaya

### Pantulan cahaya



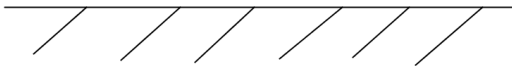
### Cermin satah

#### Pembentukan imej

objek



mata



#### Kedudukan imej

→

→ jarak imej (dari cermin)

jarak objek

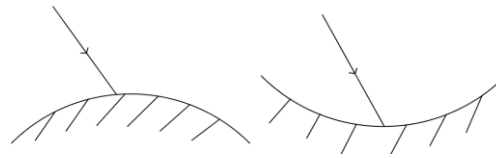
#### Ciri imej cermin satah

→

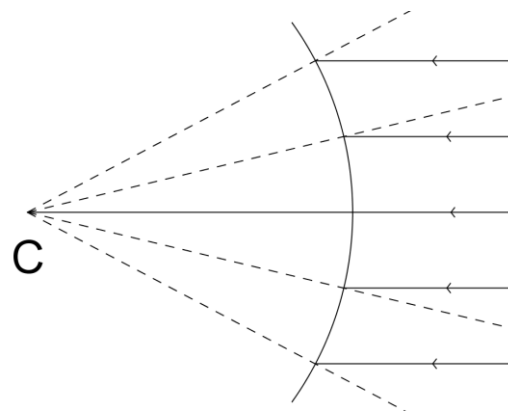
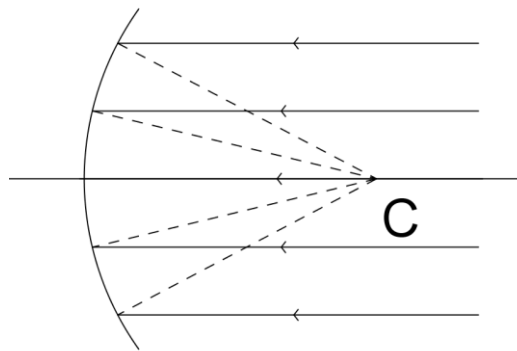
→

→

### Cermin Cembung / Cekung



C ialah pusat kelengkungan (pusat bulatan)



### Titik fokus dan Panjang fokus



### Gambarajah Sinar

\* Jika arah disongsangkan, masih ikut lintasan yang sama

#### Sebelum

Garis selari →

Melalui →

Melalui C →

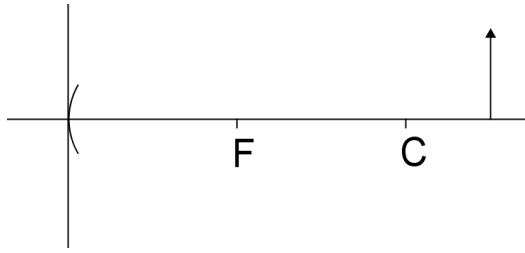
#### Selepas

→ Lukis cahaya keluar dari

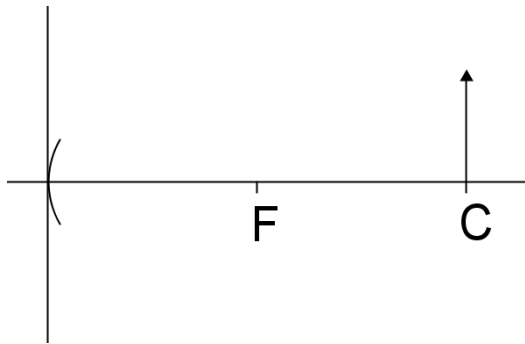
→ Bila

→ membentuk imej

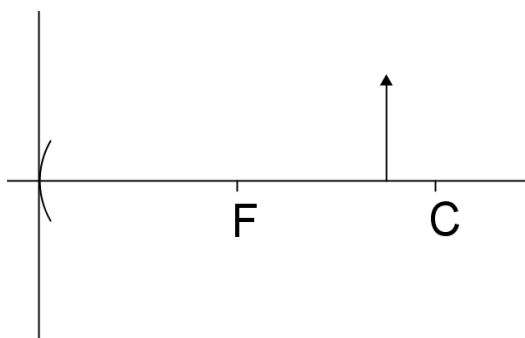
Cermin Cekung



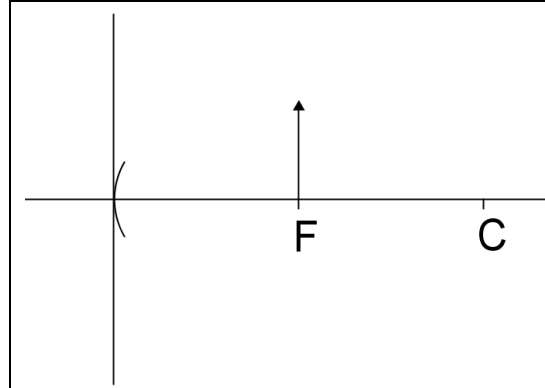
Ciri imej :



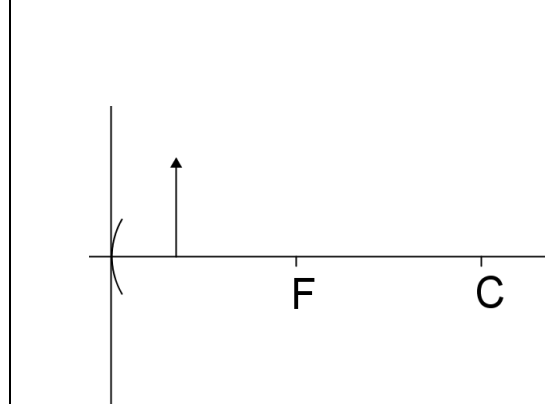
Ciri imej :



Ciri imej :

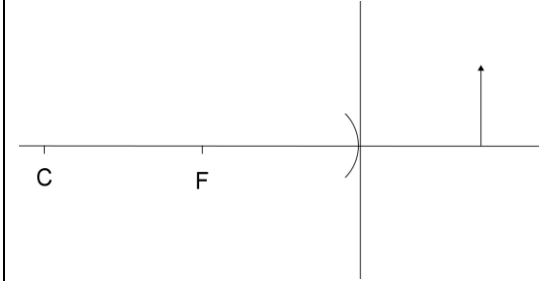


Ciri imej :

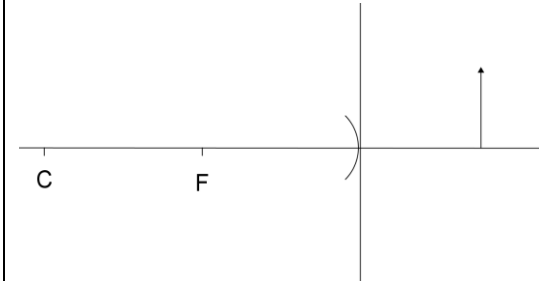


Ciri imej :

Cermin Cembung



atau



Ciri imej :

Aplikasi

Cermin cembung

→ meluaskan medan penglihatan

Cermin cembung

→ membesarkan imej

Pembiasan cahaya

Dari medium kurang tumpat ke lebih tumpat

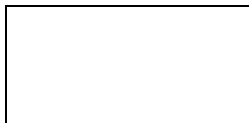
→ normal

Dari medium lebih tumpat ke kurang tumpat

→ normal



Jika sudut tuju = 90°



Indeks pembiasan

$n =$

$i \leftarrow$  sudut

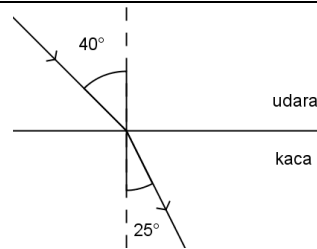
$r \leftarrow$  sudut

Untuk medium, nilai

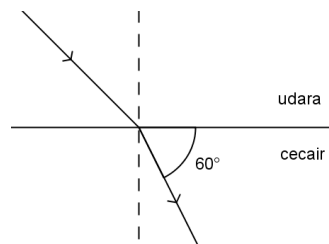
Pembiasan berlaku disebabkan perubahan halaju cahaya dalam medium

→  $v_{\text{medium}}$   $v_{\text{vakum}}$

$n =$

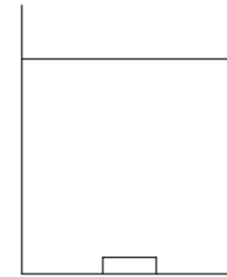


a) Hitung indeks biasan kaca



b) Indeks biasan cecair = 1.2. Hitung sudut tuju

Dalam nyata/ Dalam ketara

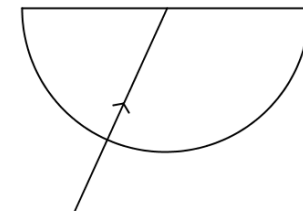


Pantulan dalam penuh

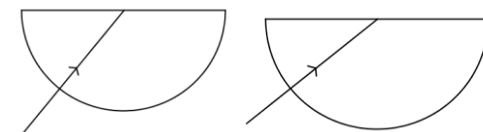
Bila cahaya merambat dari medium lebih tumpat ke kurang tumpat,

→ sebahagian cahaya

→ selain daripada yang terbias



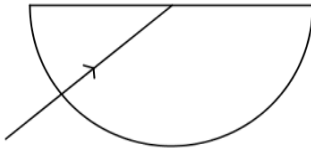
Bila sinar tuju bertambah,



### Sudut genting

→ sudut tuju di mana sinar terbias di

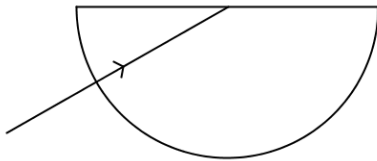
(sudut biasan = )



Bila sudut tuju > sudut genting

→ sinar terbias

→ pantulan dalam



Sudut tuju < Sudut genting

→

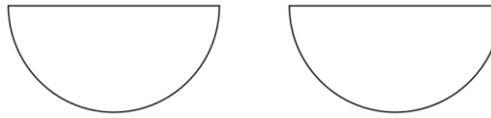
Sudut tuju = Sudut genting

→

Sudut tuju > Sudut genting

→

### Sudut genting dengan n



$n \uparrow, c$

→ pantulan dalam penuh lebih

berlaku

### Aplikasi Pantulan dalam penuh

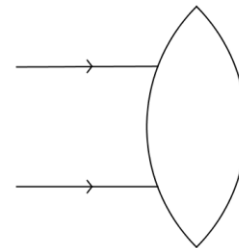
→ prisma menggantikan cermin

→ bentuk berlian

→ gentian optik

### Kanta

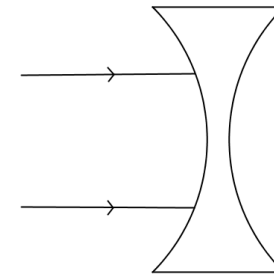
Kanta cembung



→

→ nilai  $f$

### Kanta cekung



→

→ nilai  $f$

### Gambarajah Sinar

Cahaya akan terbias, bukan terpantul

Sebelum

Garis selari →

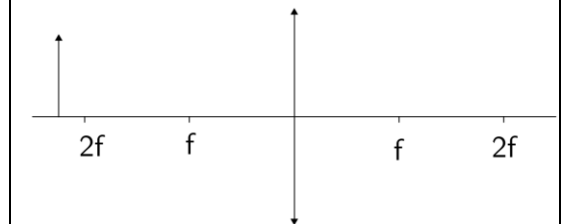
Melalui →

Melalui pusat →

Selepas

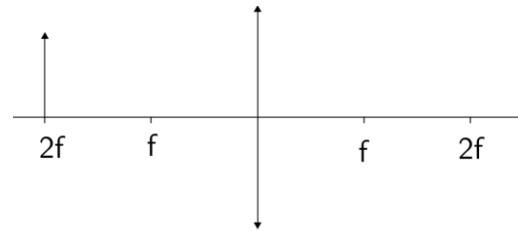
Kanta Cembung

a)  $u > 2f$



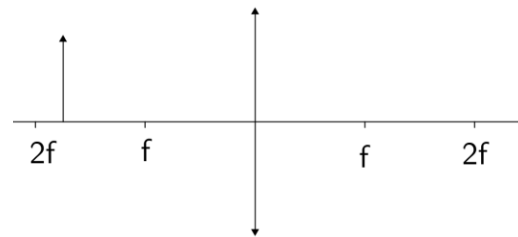
Ciri imej :

b)  $u = 2f$



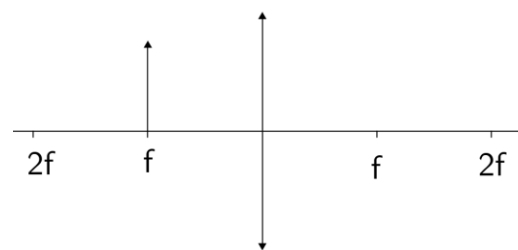
Ciri imej :

c)  $f < u < 2f$



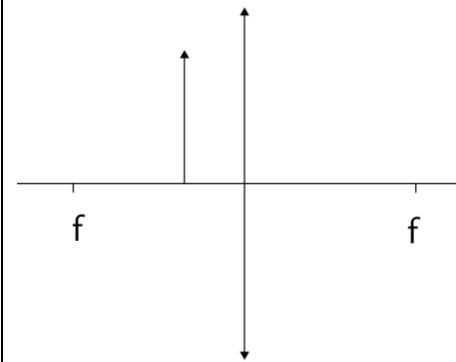
Ciri imej :

d)  $u = f$



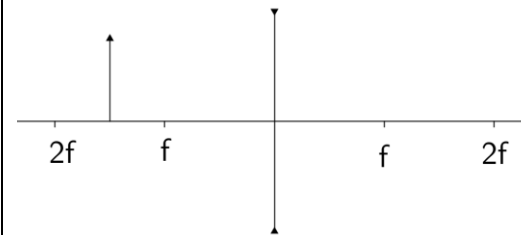
Ciri imej :

e)  $u < f$



Ciri imej :

Kanta Cekung



Ciri imej :

Kanta Cembung / Cermin

$u > 2f$  :

$u = 2f$  :

$f < u < 2f$  :

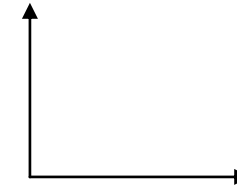
$u = f$  :

$u < f$  :

Kanta Cekung / Cermin

Persamaan Kanta

$$\frac{1}{u} + \frac{1}{v} = \frac{1}{f}$$



Pembesaran,  $m =$

Kuasa,

Aplikasi

→ kanta pembesar

→ kanta

→ cermin mata

→ rabun jauh →

→ Mikroskop

Diag

Sifat

→Teleskop

Diag

Sifat