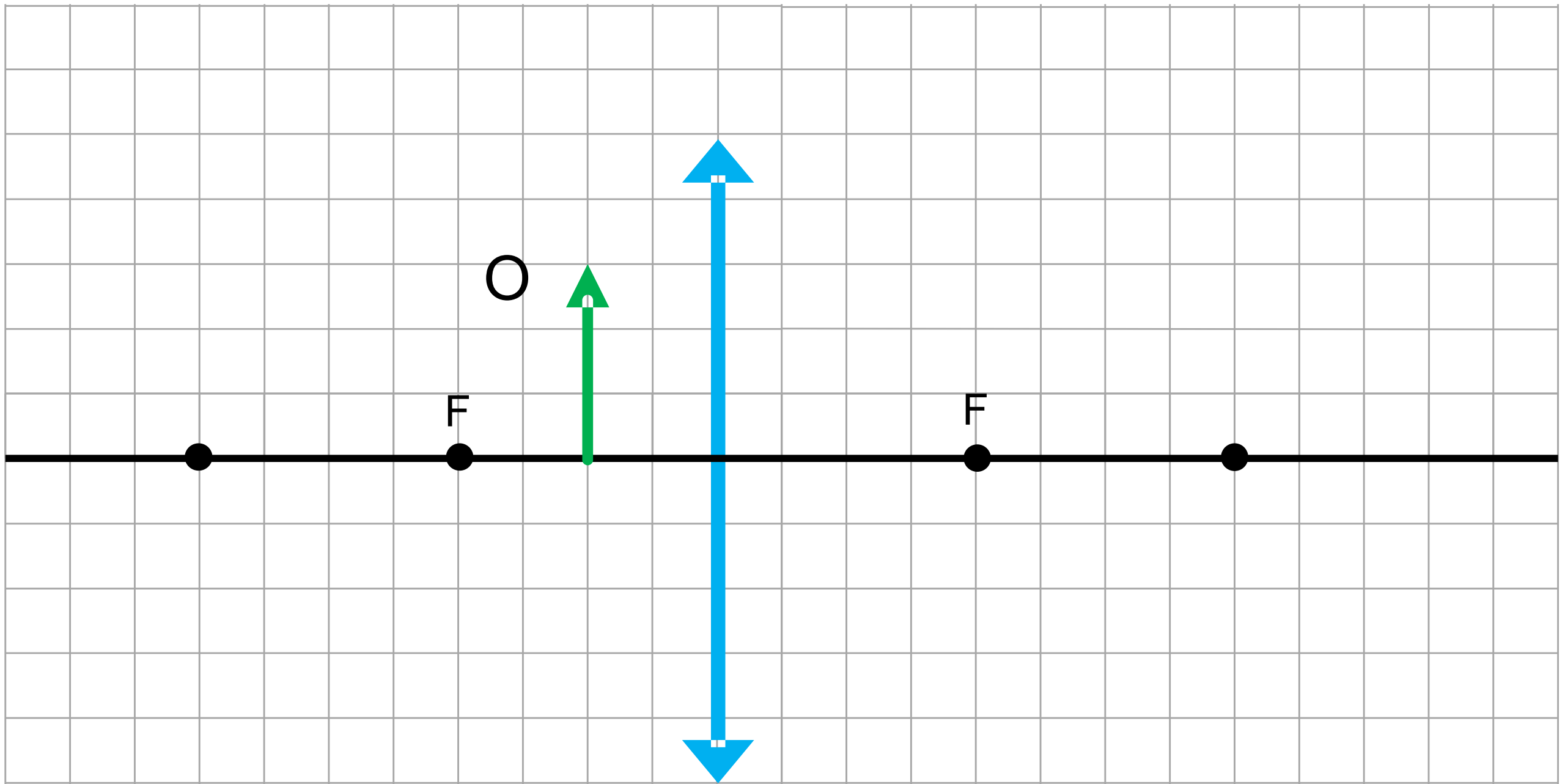


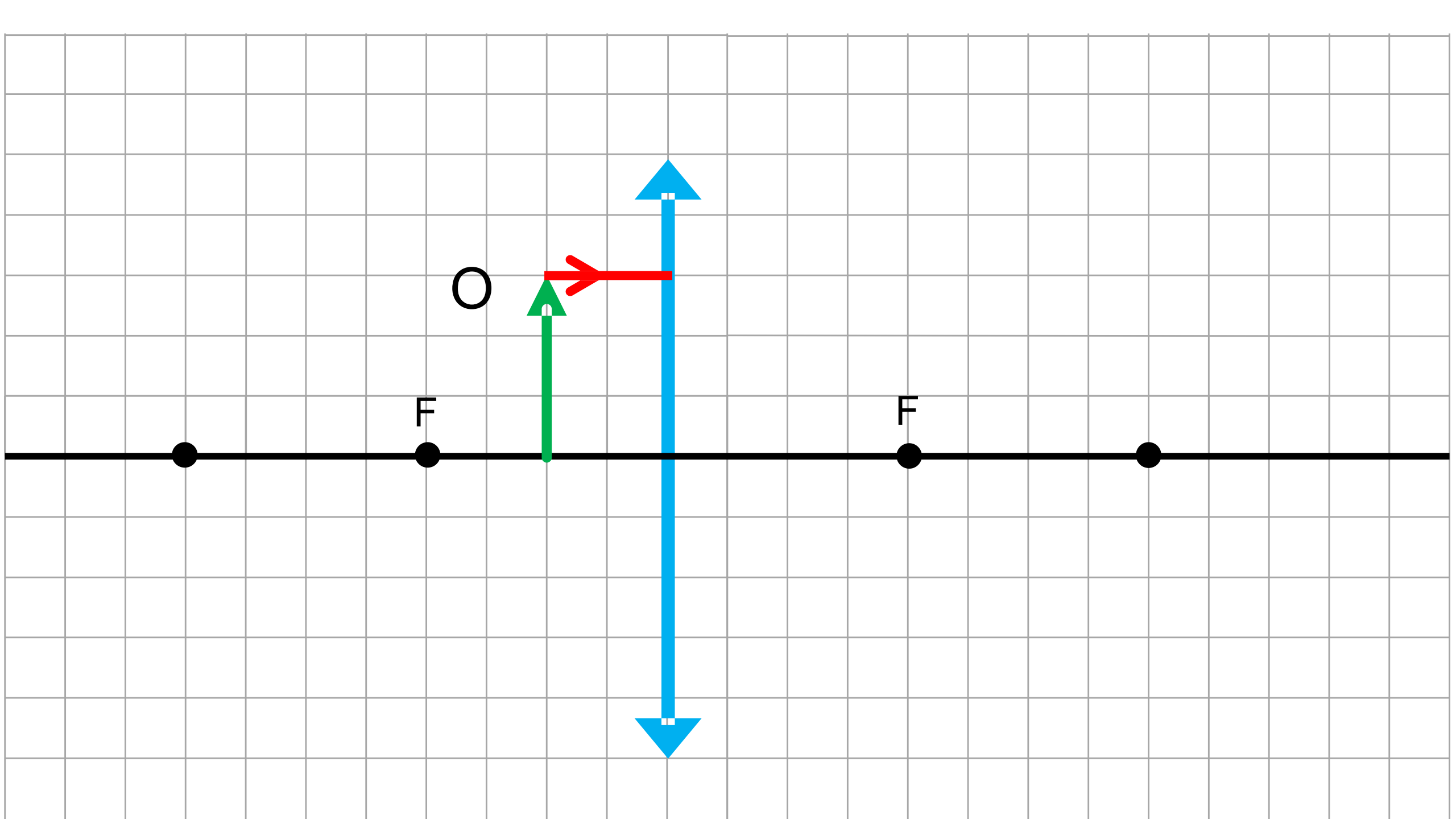
INSTRUMENTOS ÓTICOS

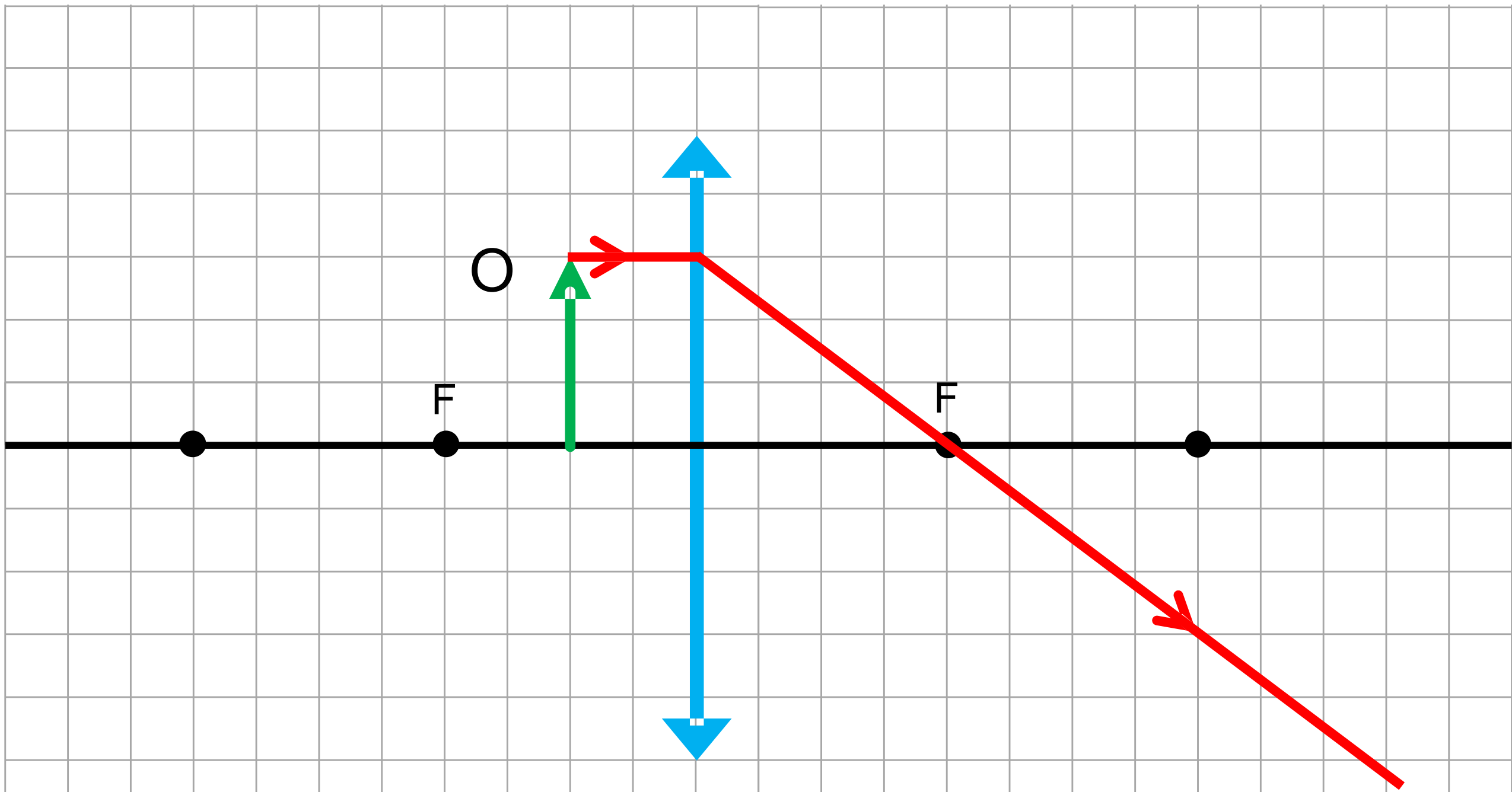
FÍSICA

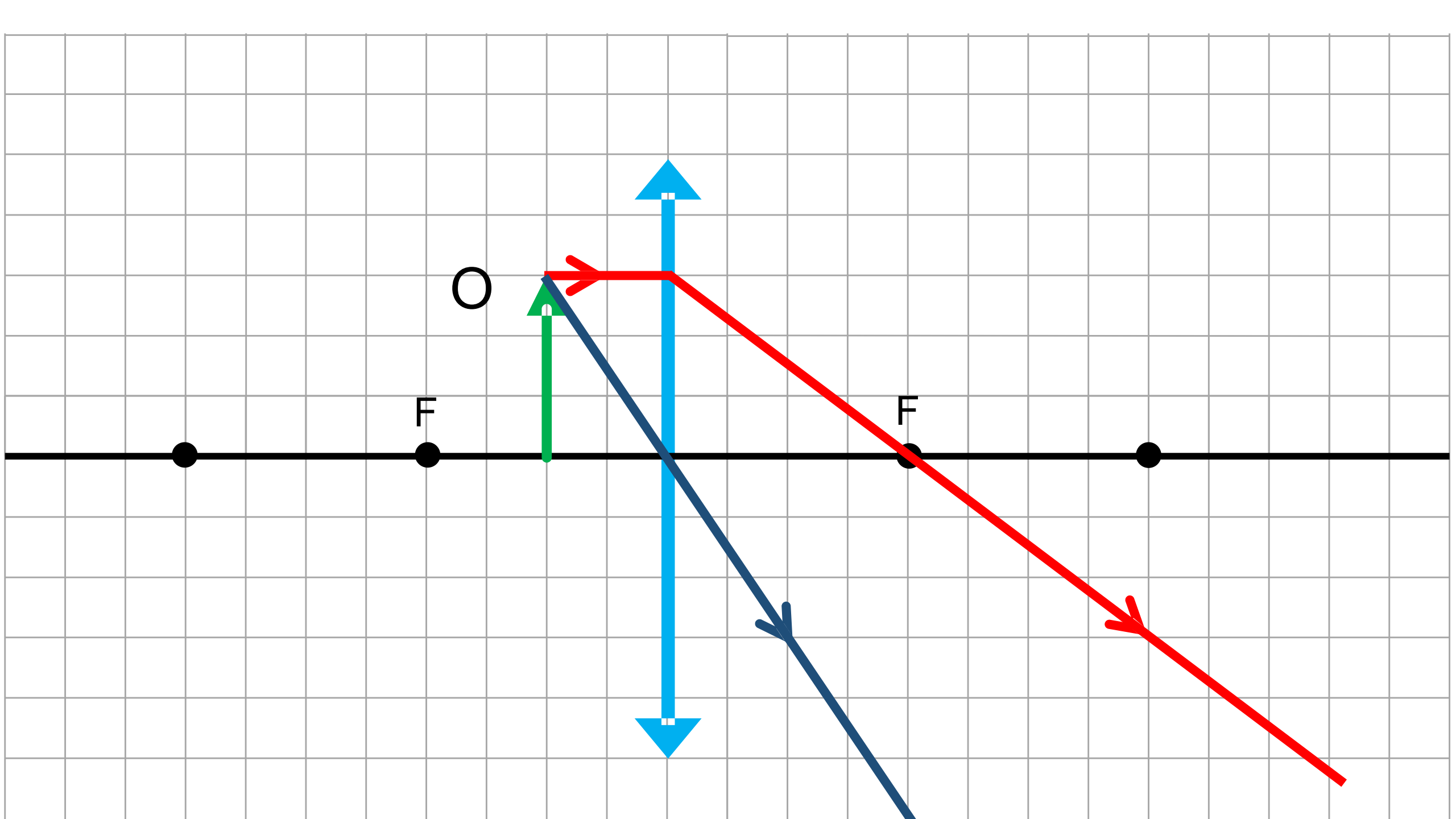
Professor Danilo

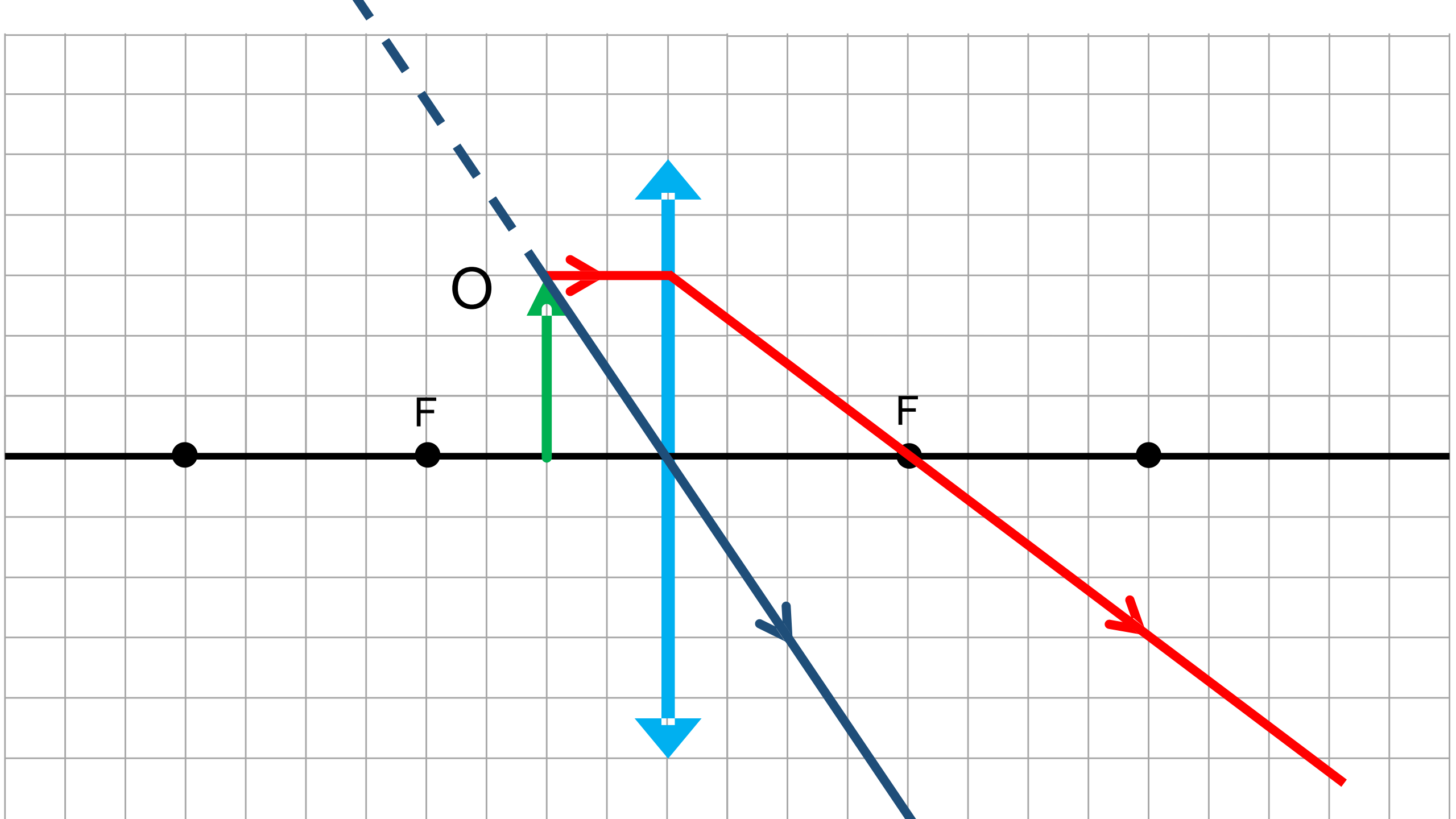
Lupa

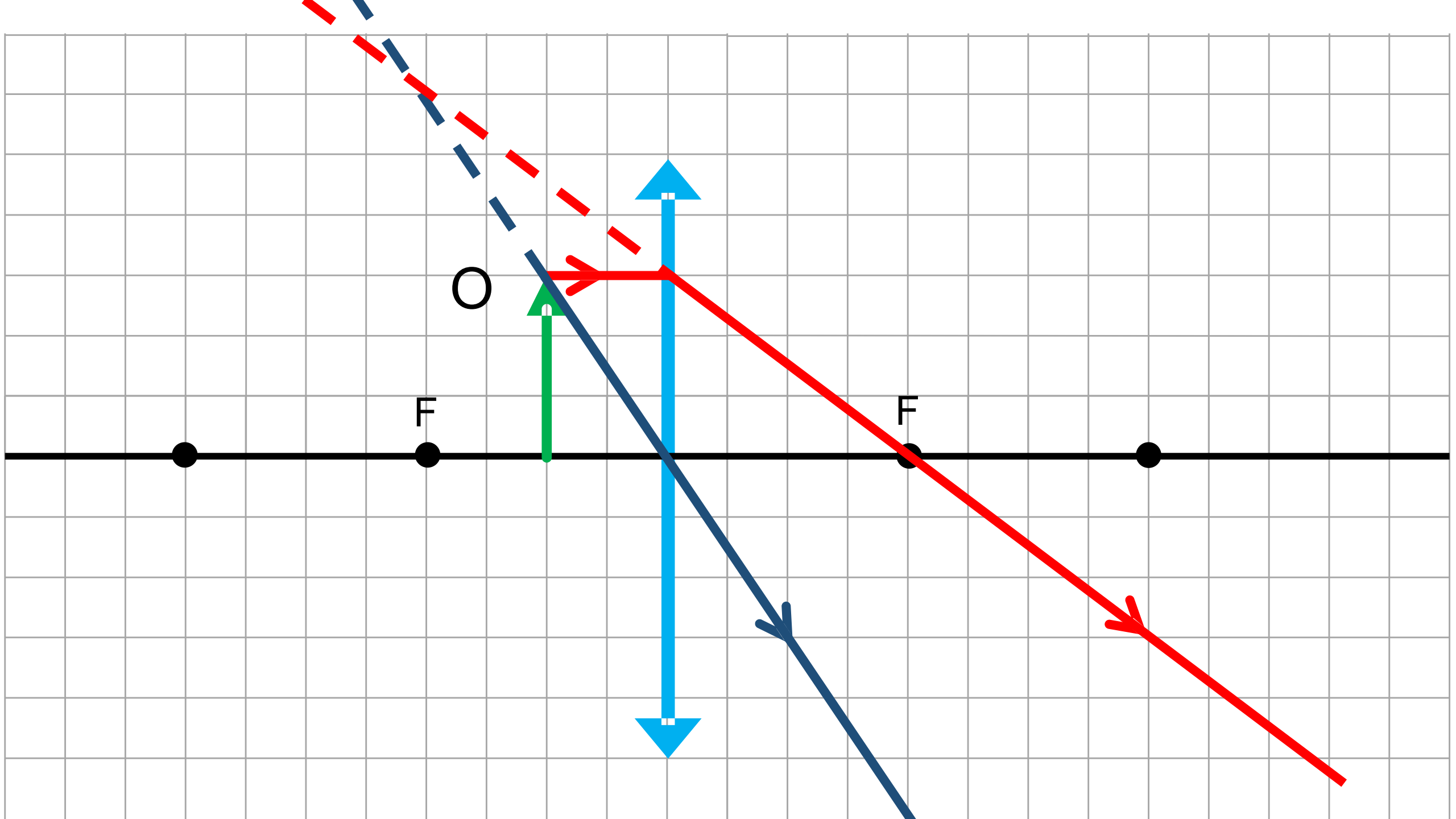


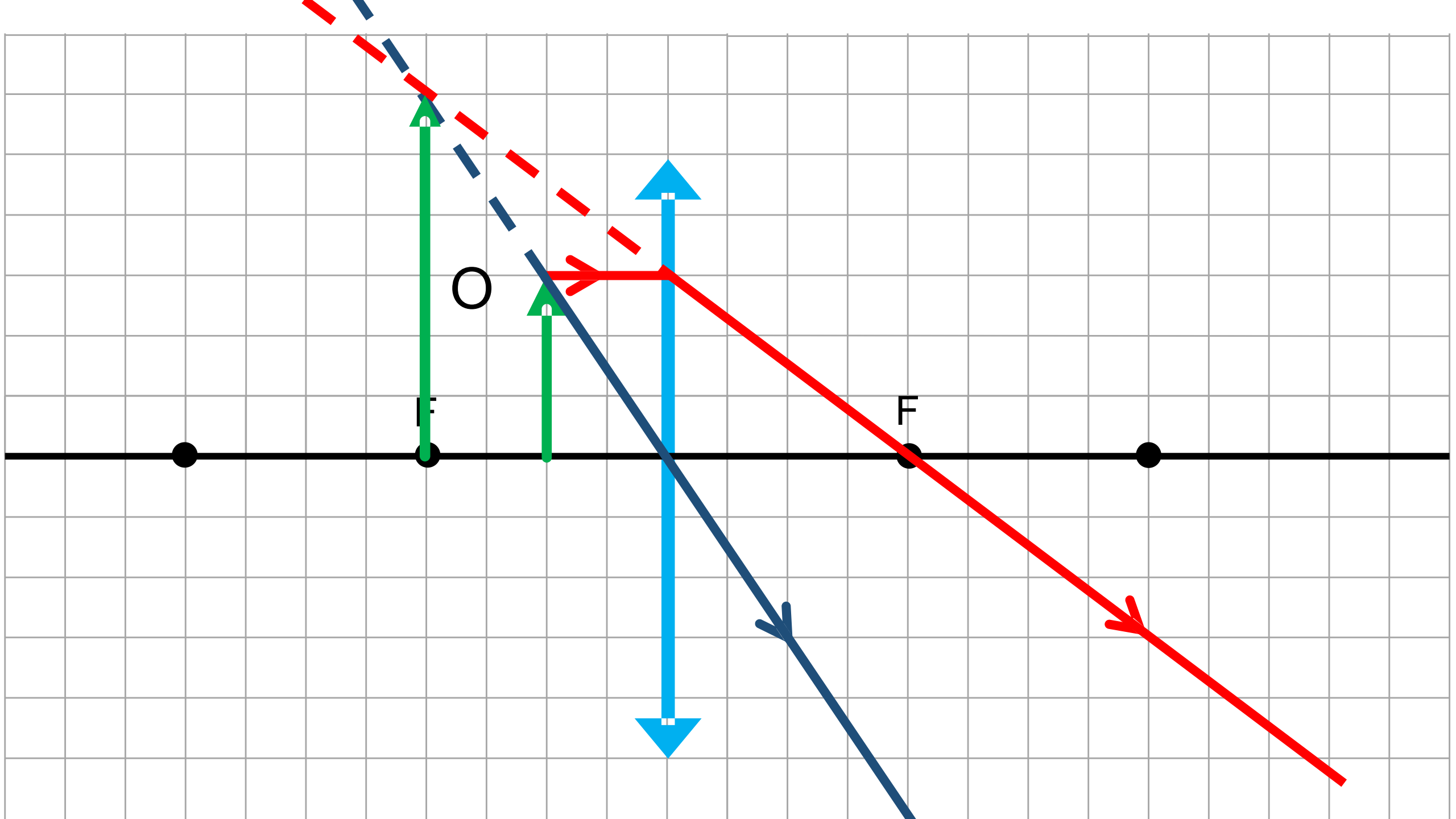












LUPA

LUPA

- IMAGEM:

LUPA

- IMAGEM:
 - VIRTUAL

LUPA

- IMAGEM:
 - VIRTUAL
 - DIREITA

LUPA

- IMAGEM:
 - VIRTUAL
 - DIREITA
 - MAIOR

LUPA

- IMAGEM:
 - VIRTUAL
 - DIREITA
 - MAIOR
 - Mais distante da lente que o objeto

LUPA

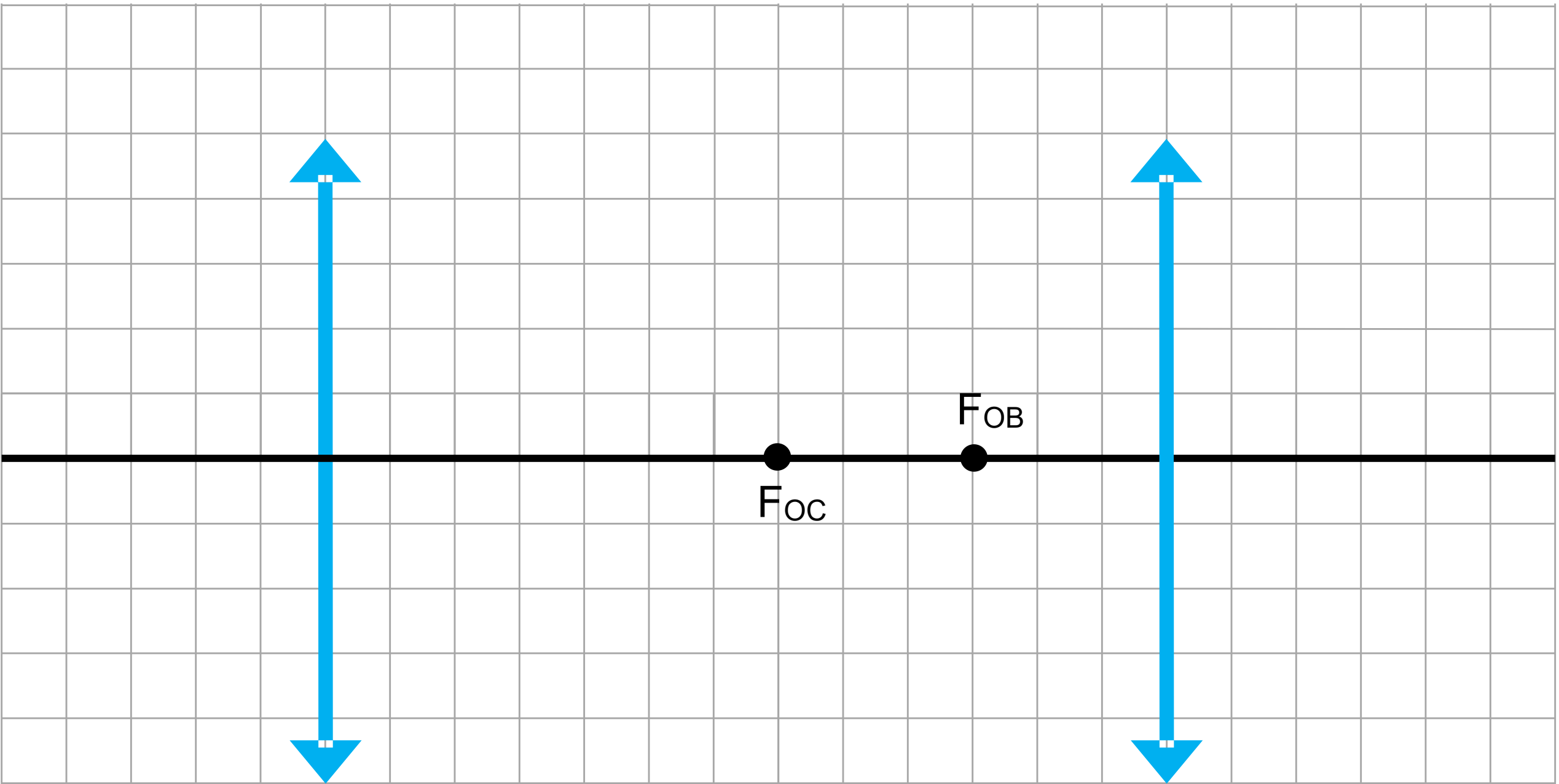
- IMAGEM:
 - VIRTUAL
 - DIREITA
 - MAIOR
 - Mais distante da lente que o objeto
- Qualquer lente convergente pode servir como lupa

LUPA

- IMAGEM:
 - VIRTUAL
 - DIREITA
 - MAIOR
 - Mais distante da lente que o objeto
- Qualquer lente convergente pode servir como lupa



LUNETAS ASTRONÔMICAS



Objetiva



Ocular

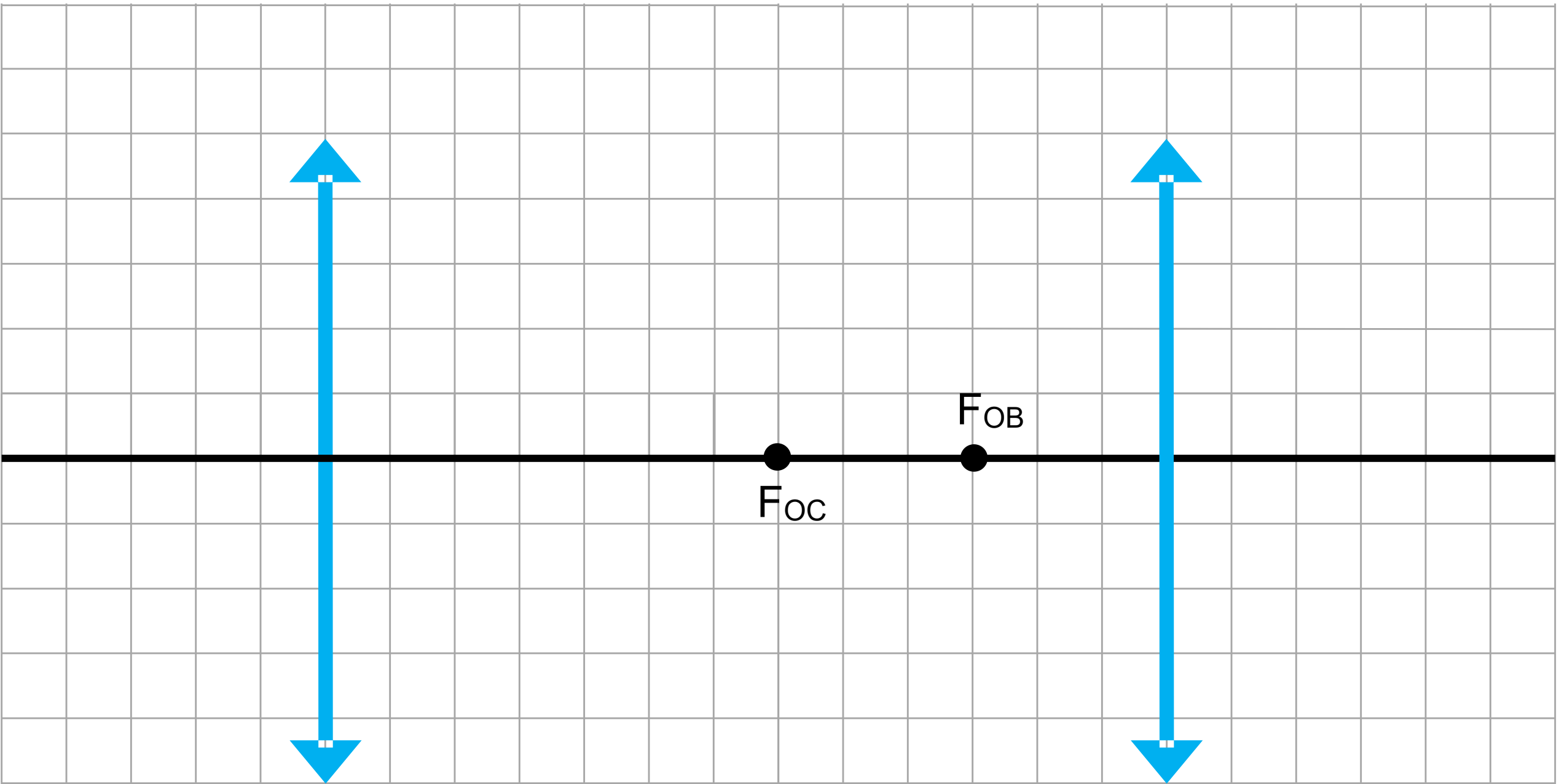


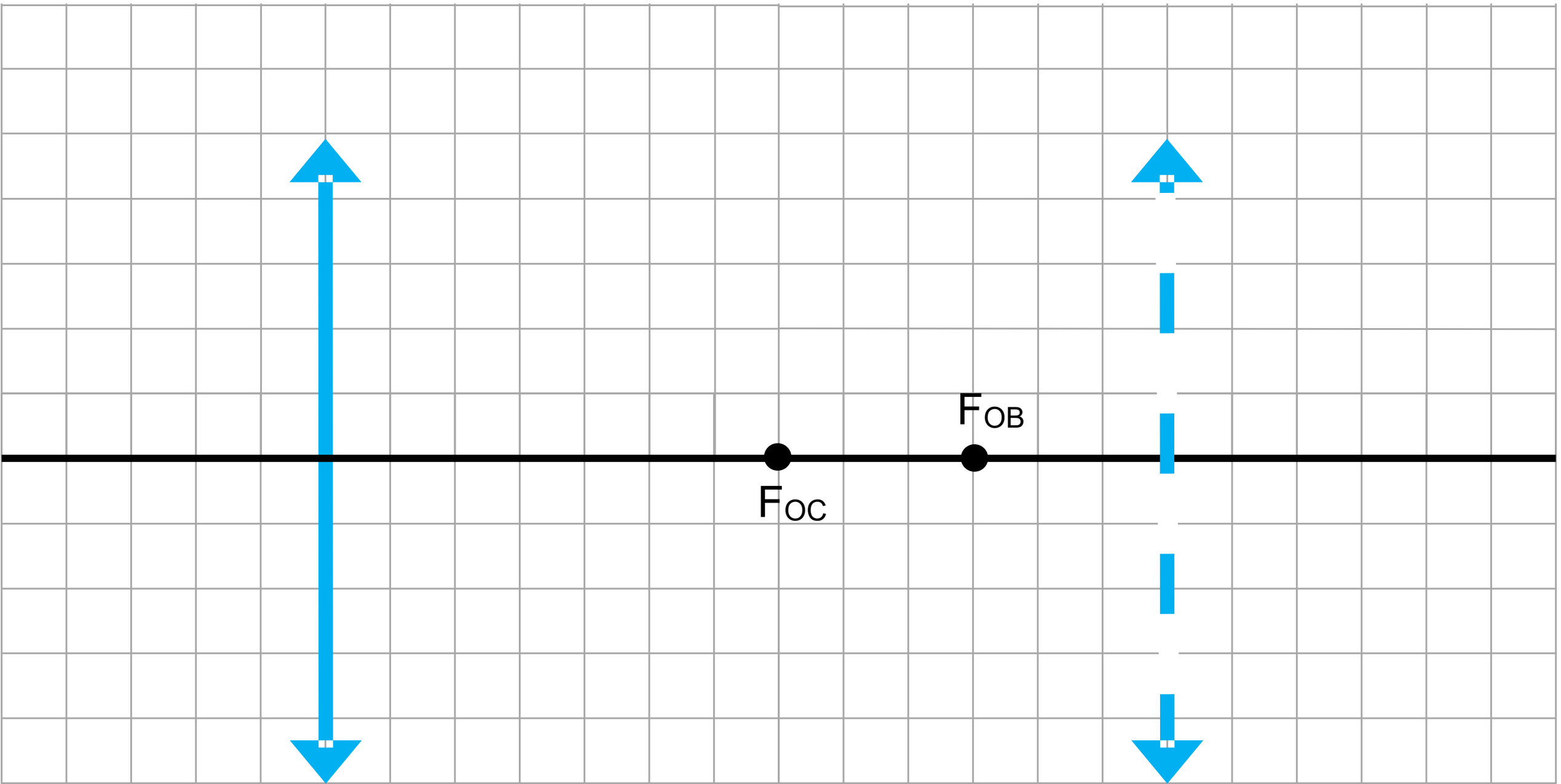
F_{oc}

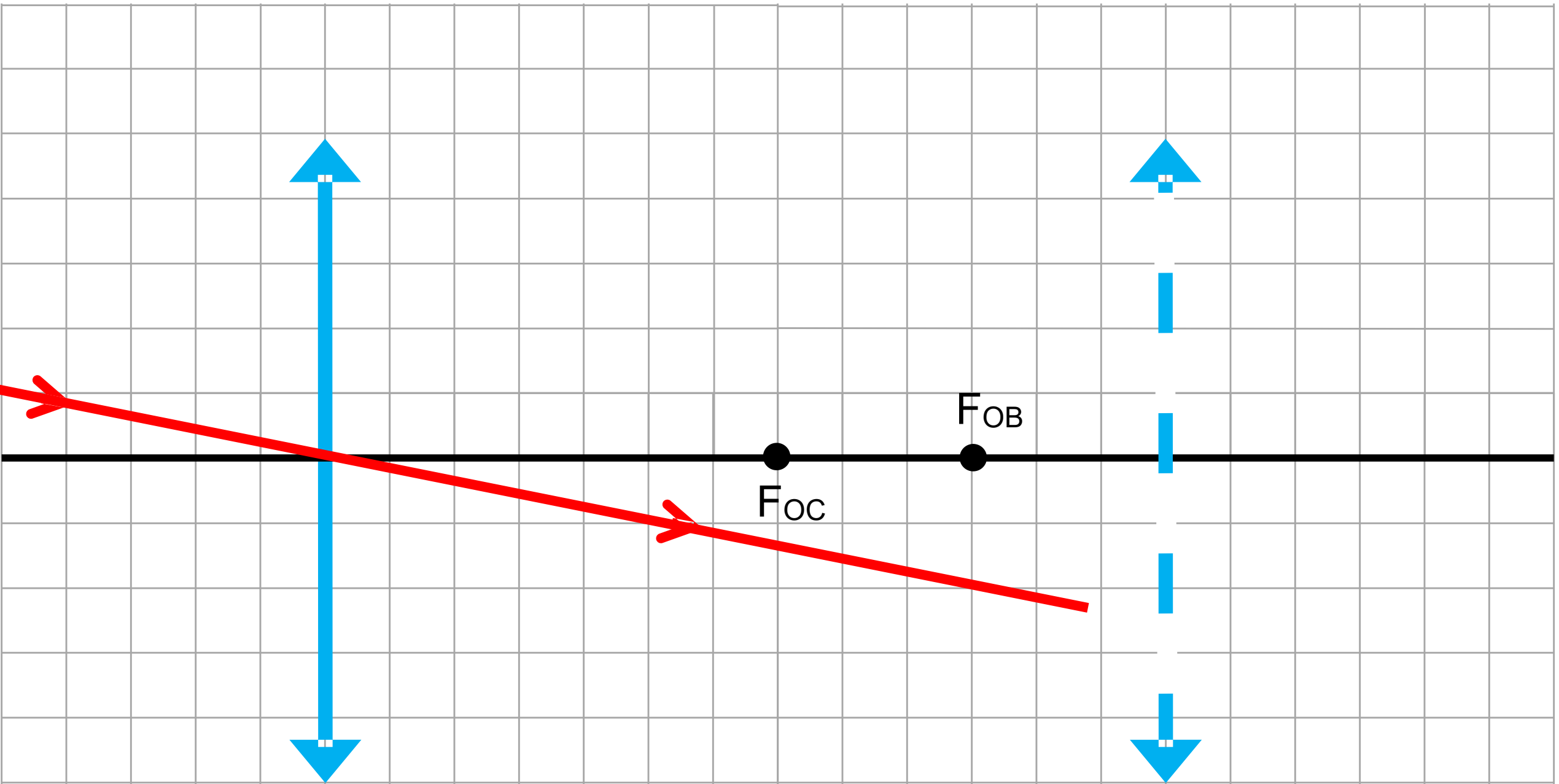


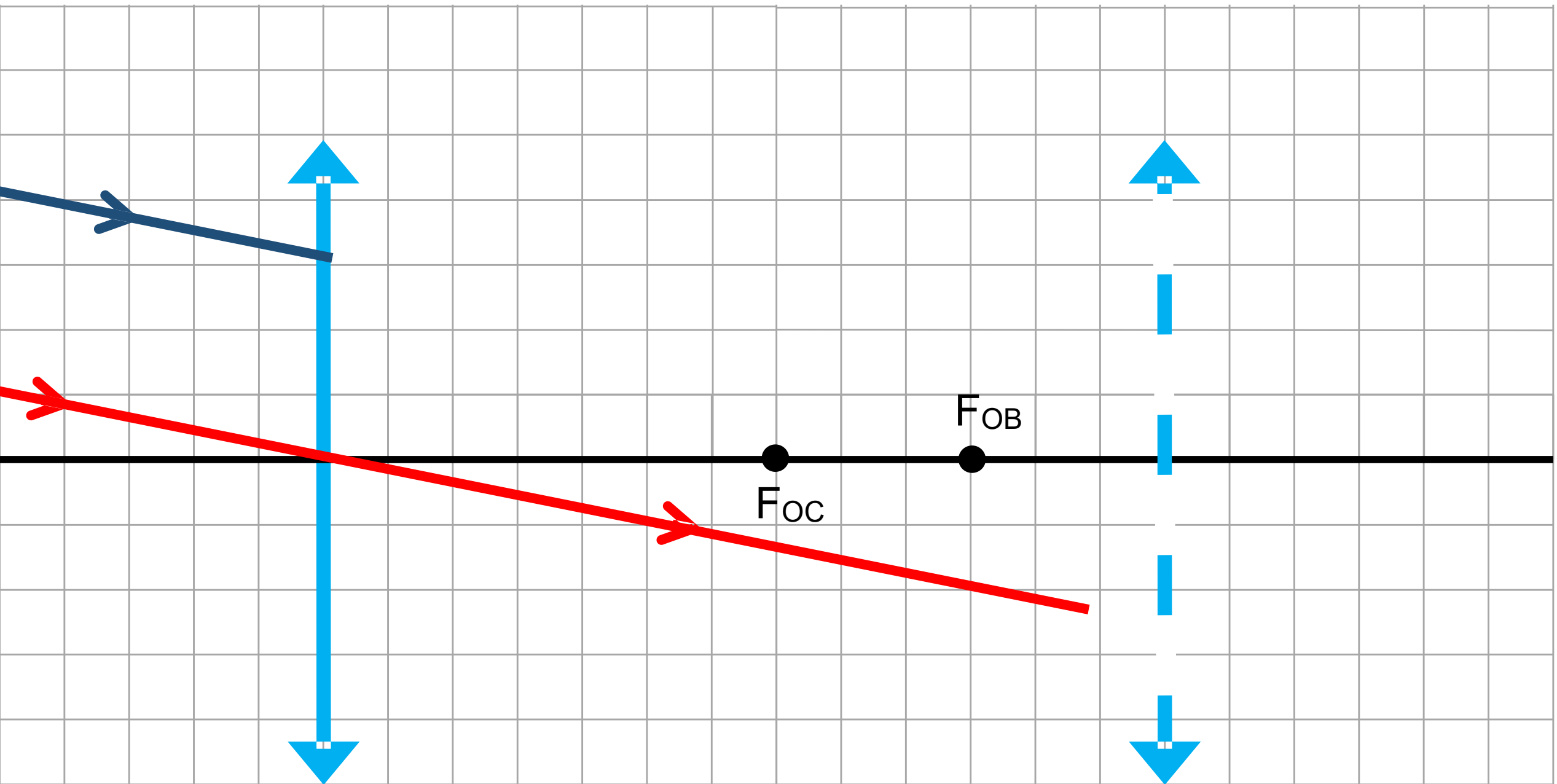
F_{OB}

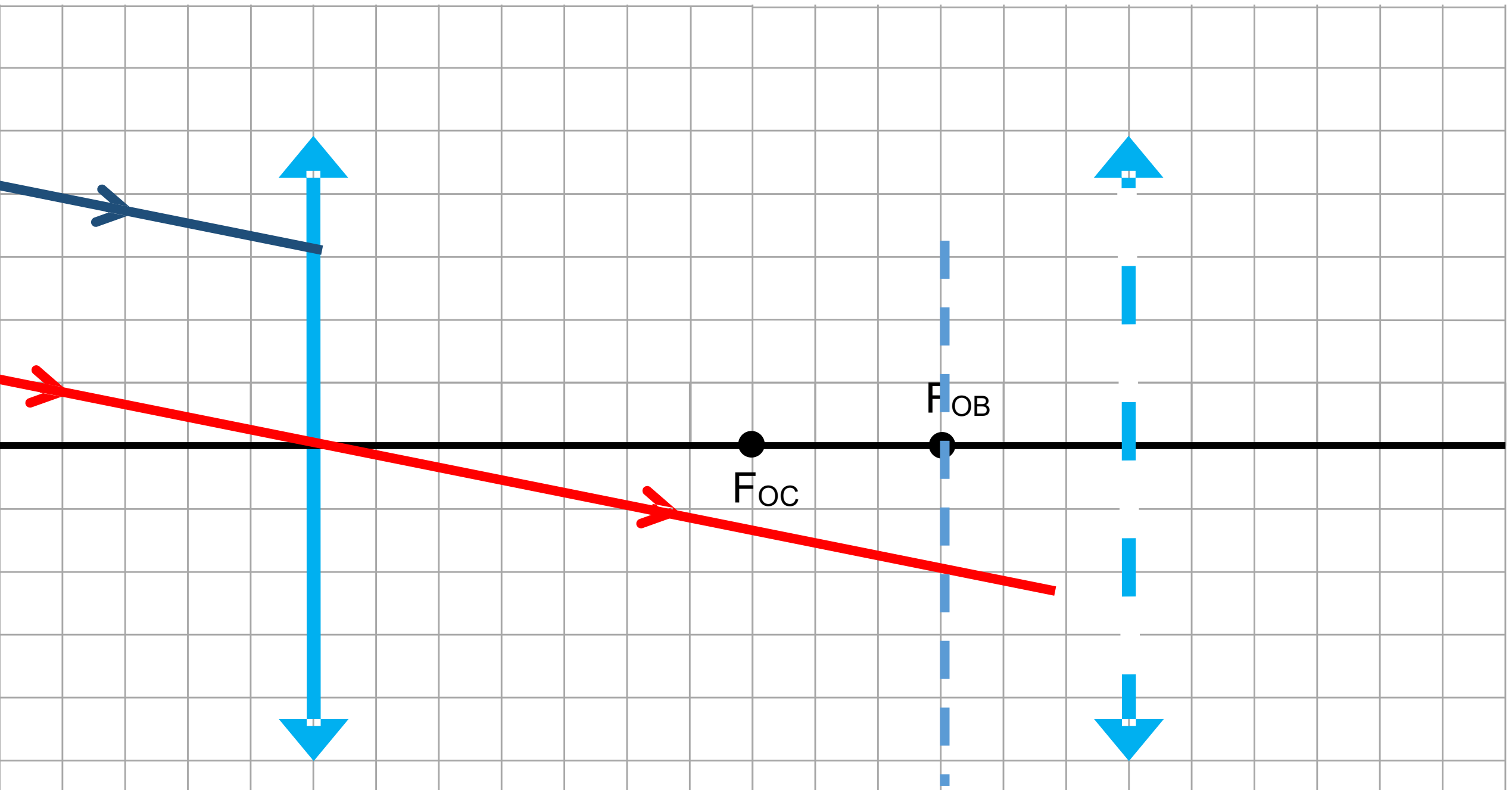


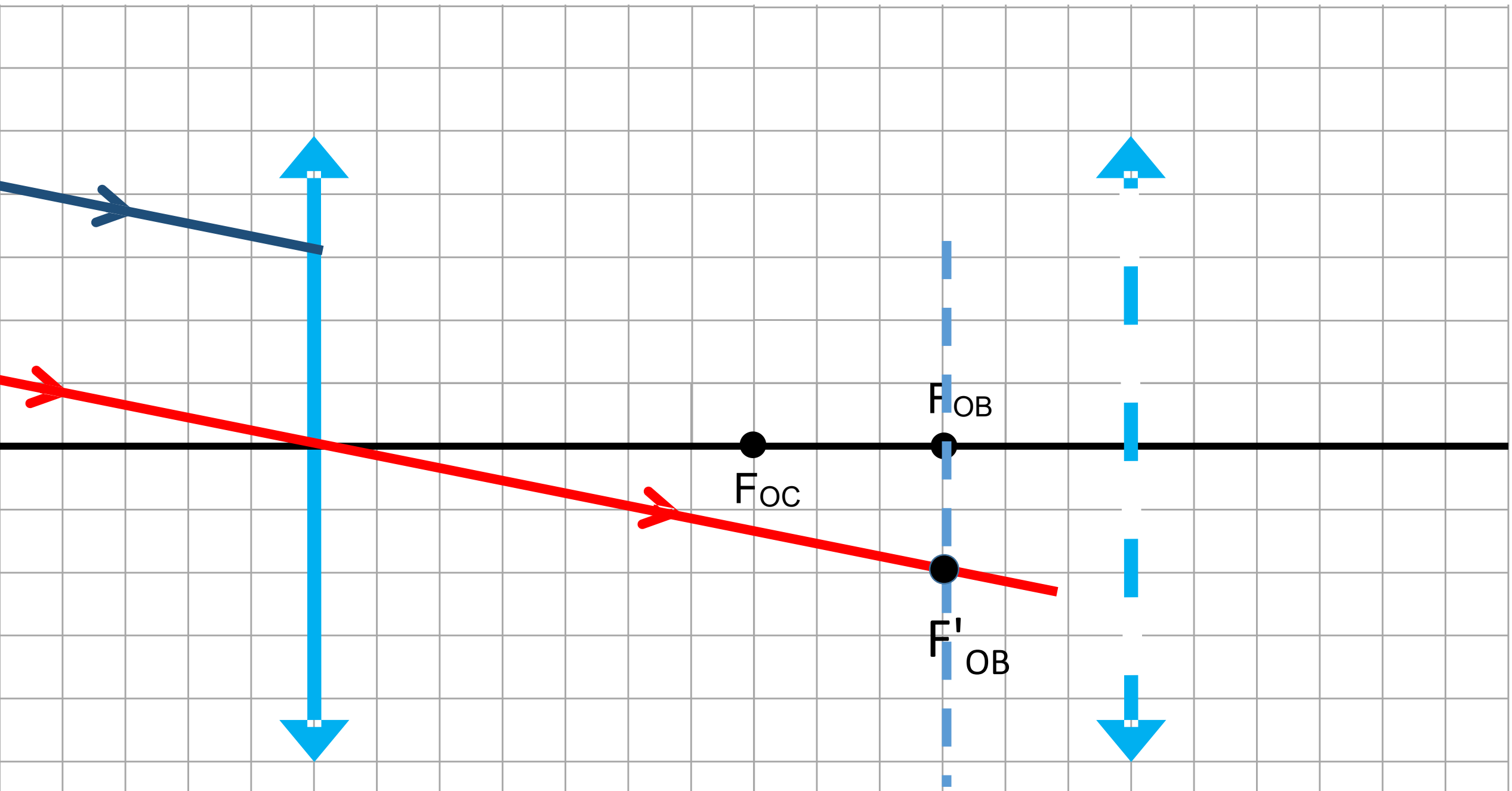


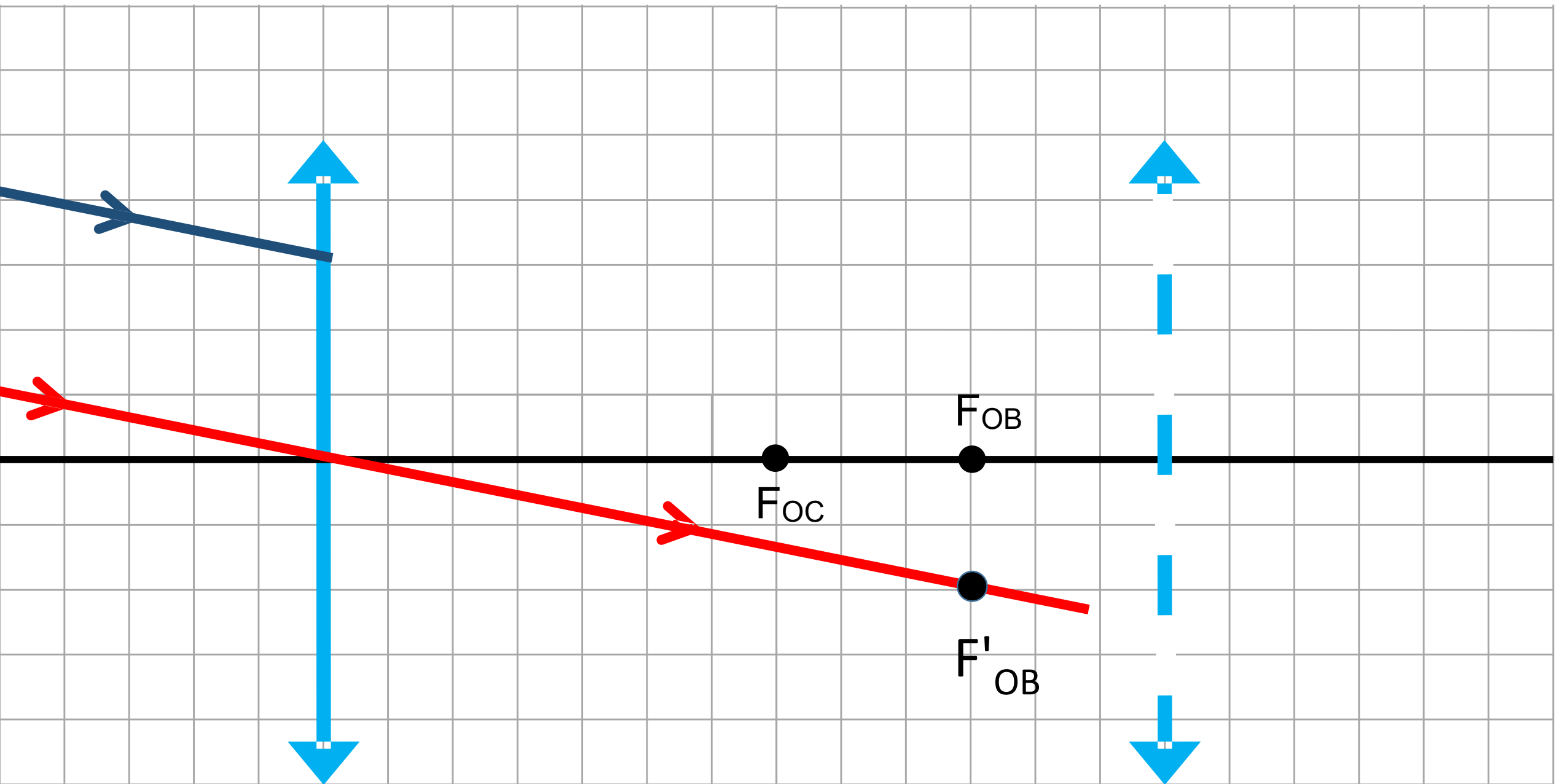


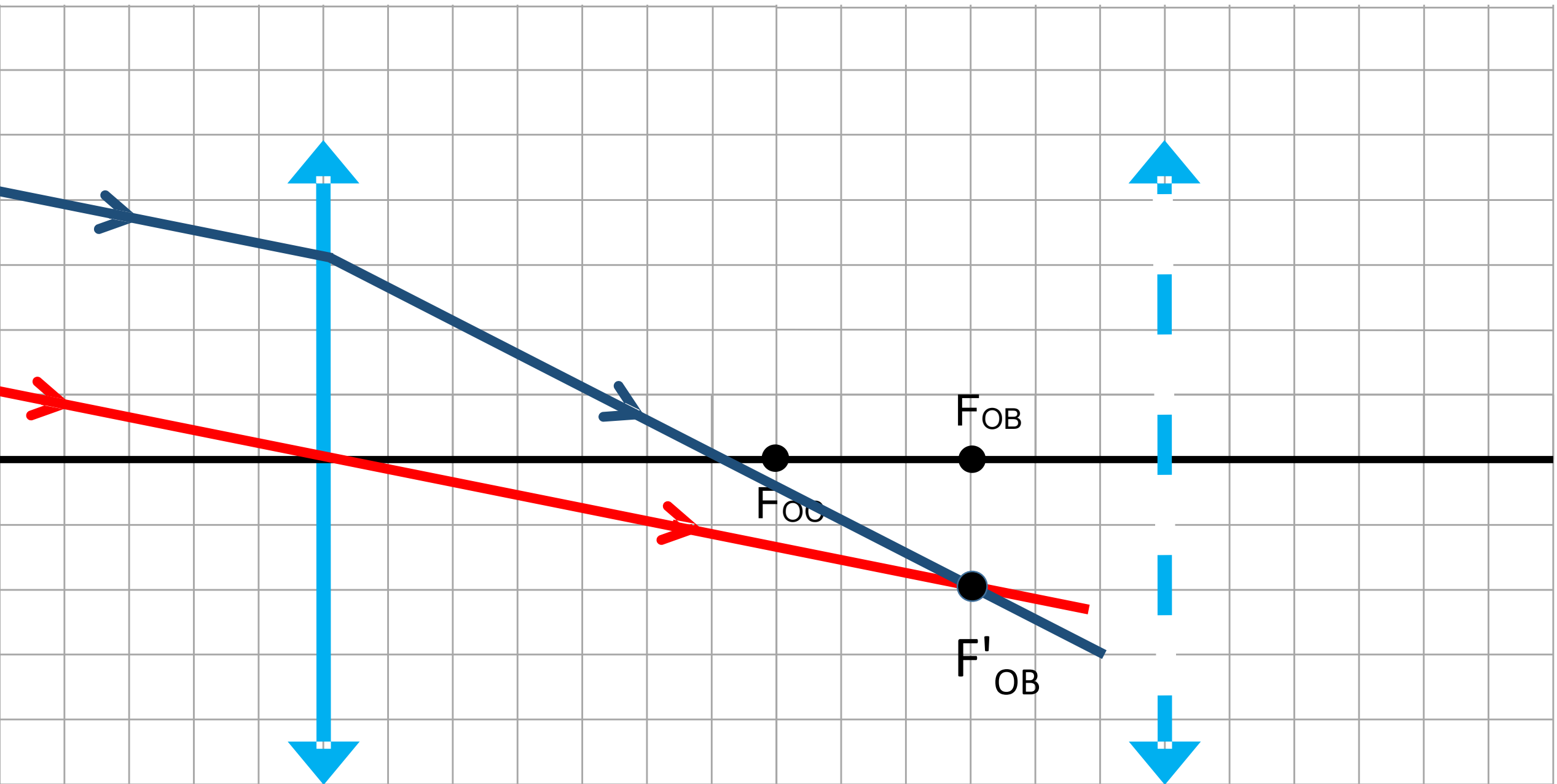


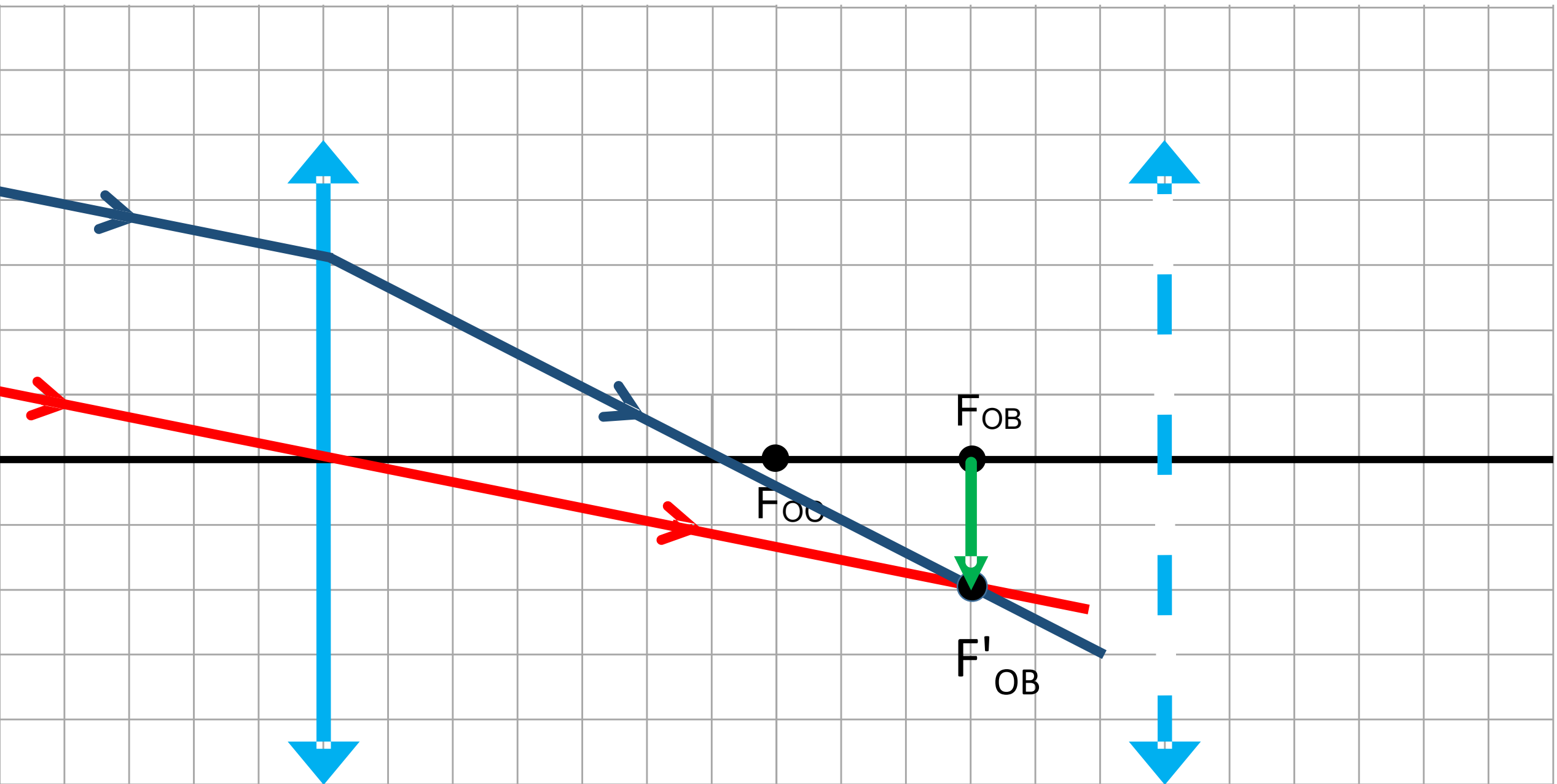


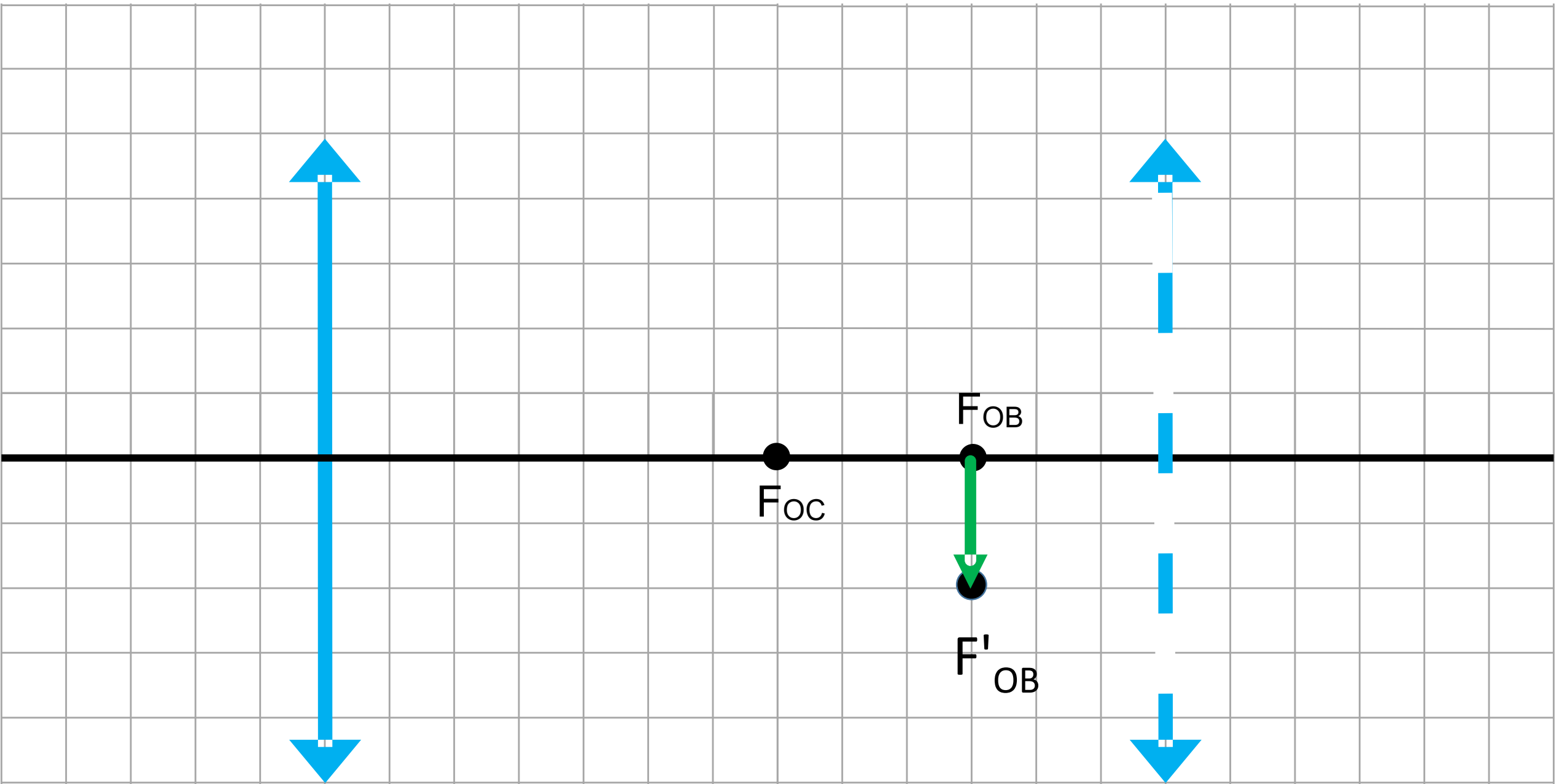


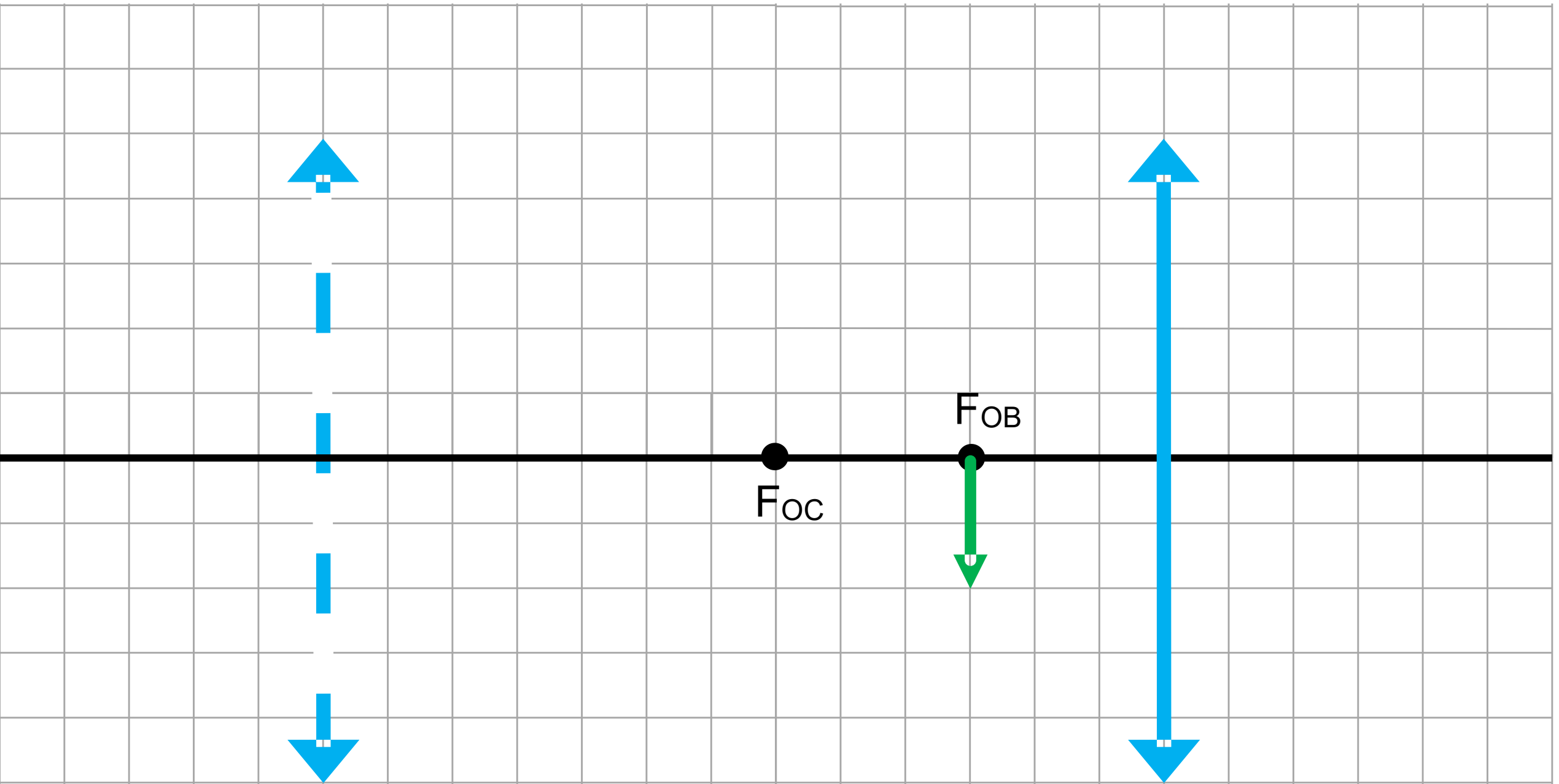


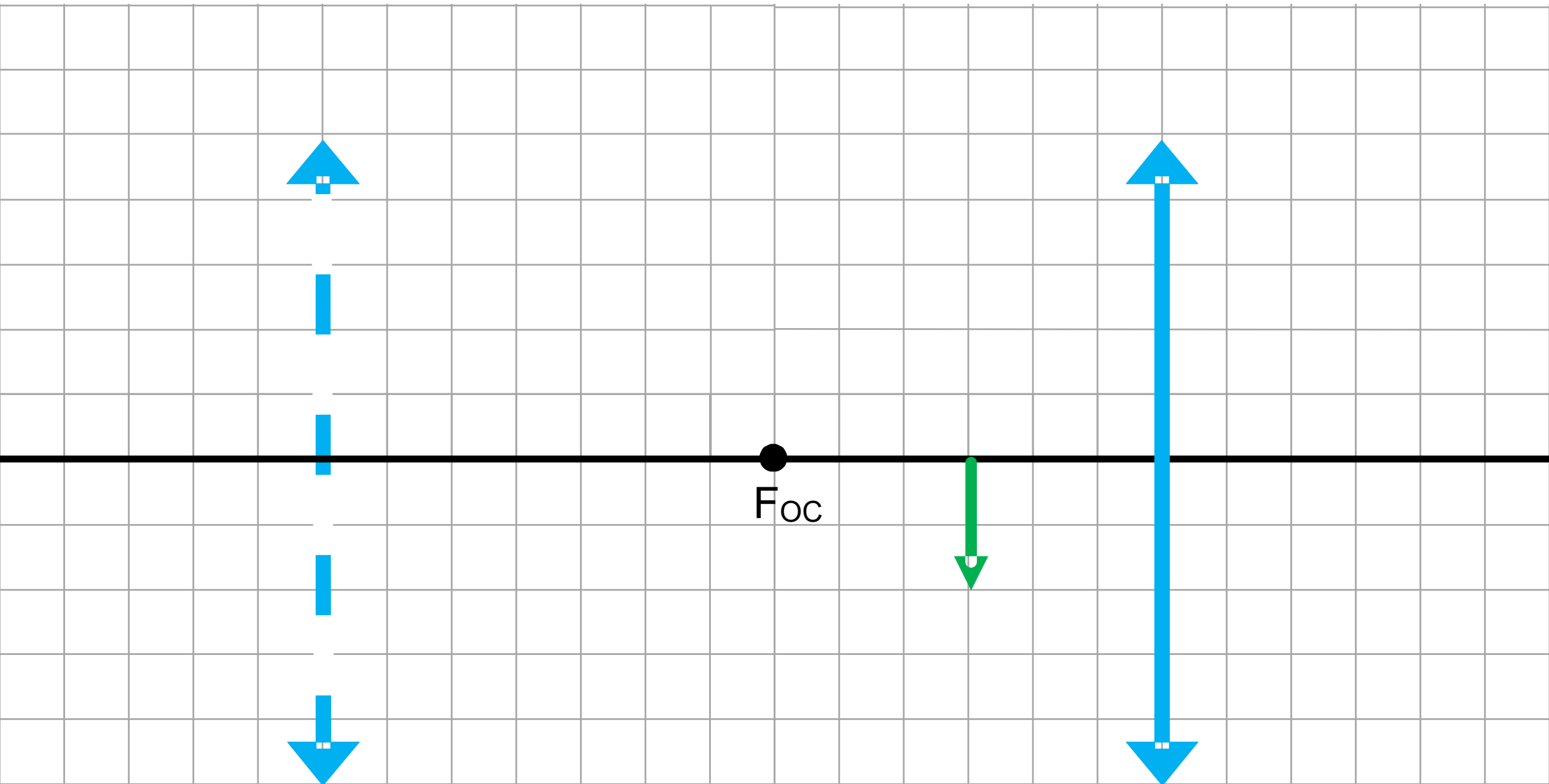


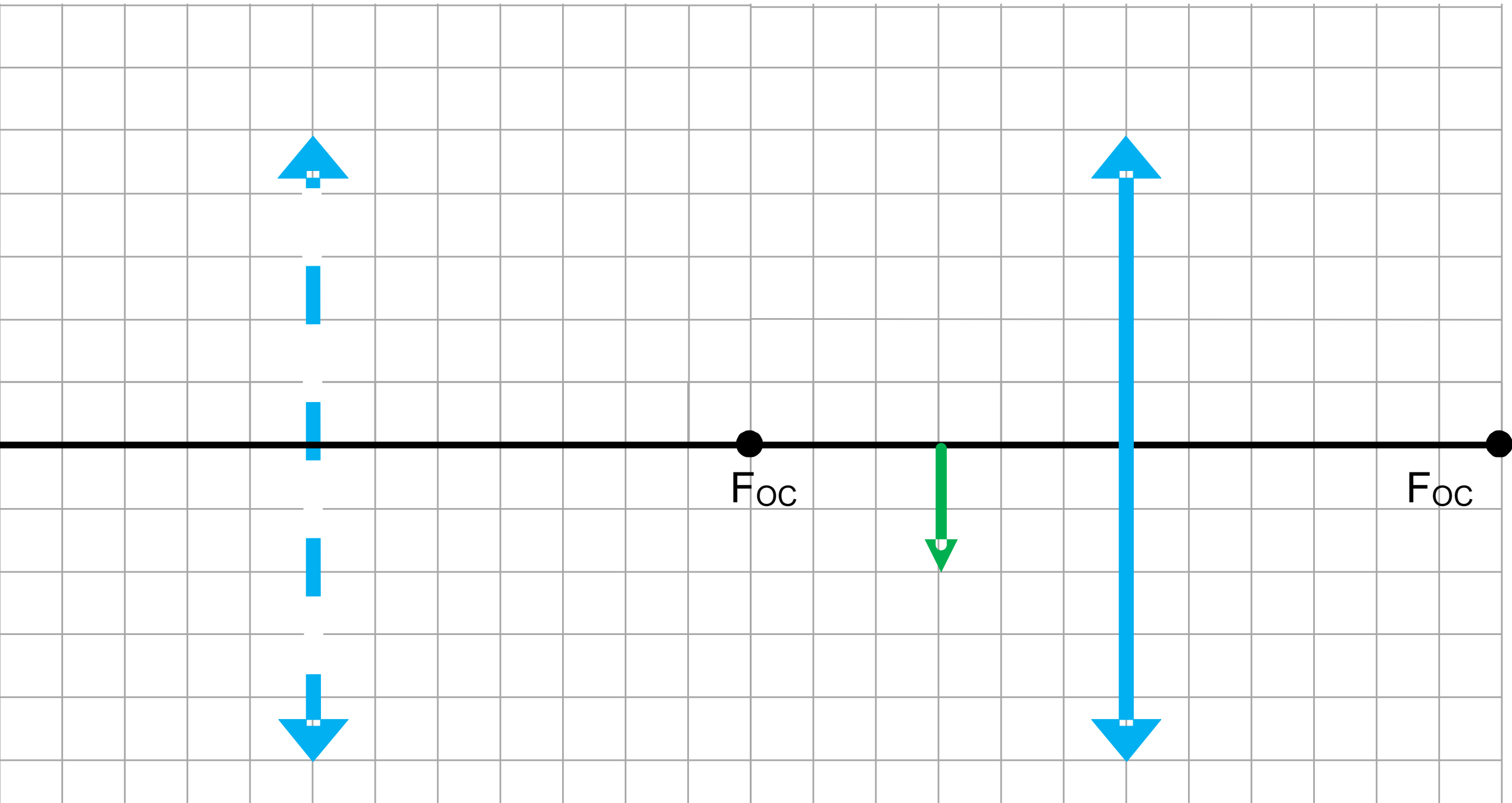


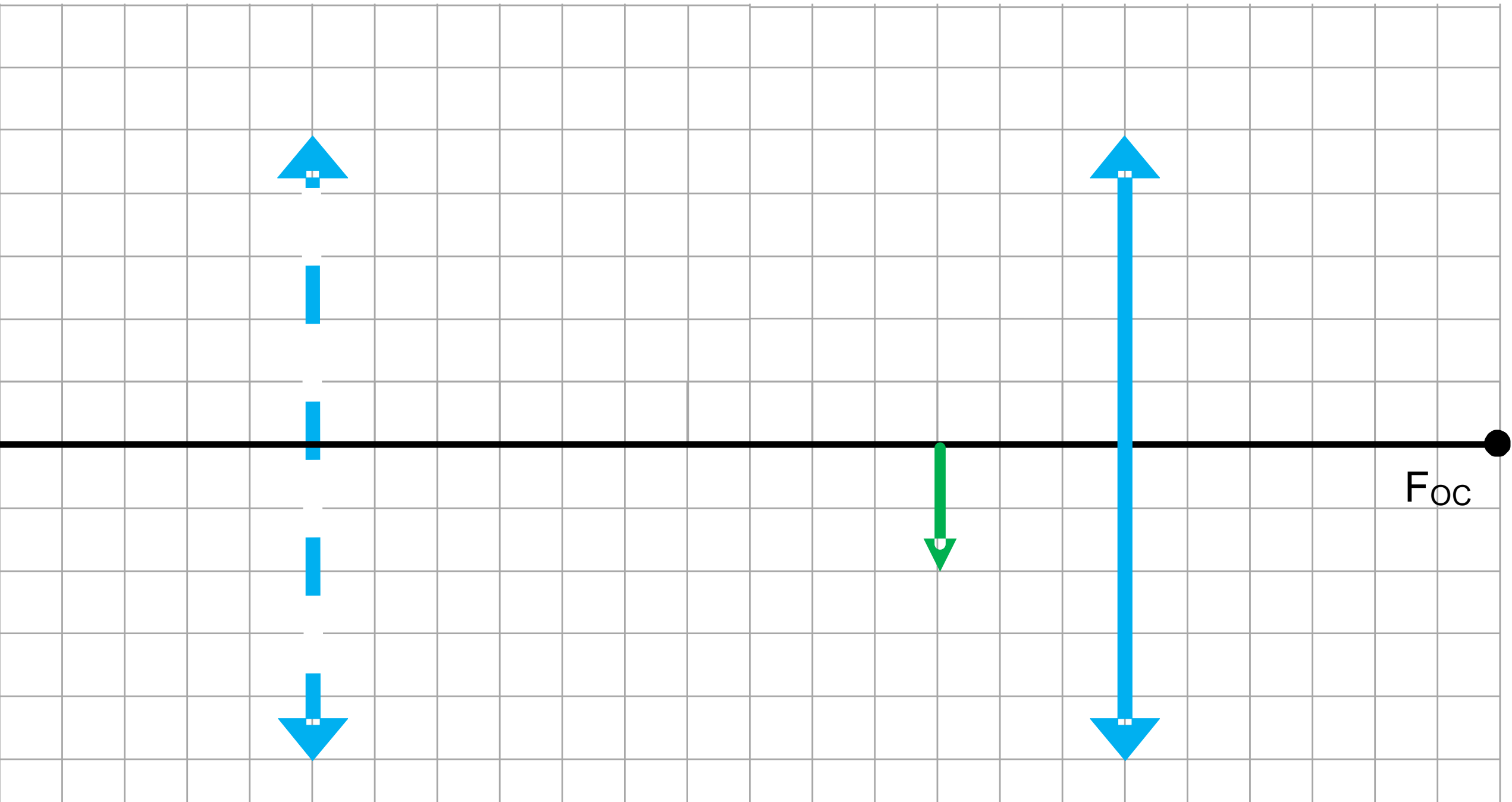


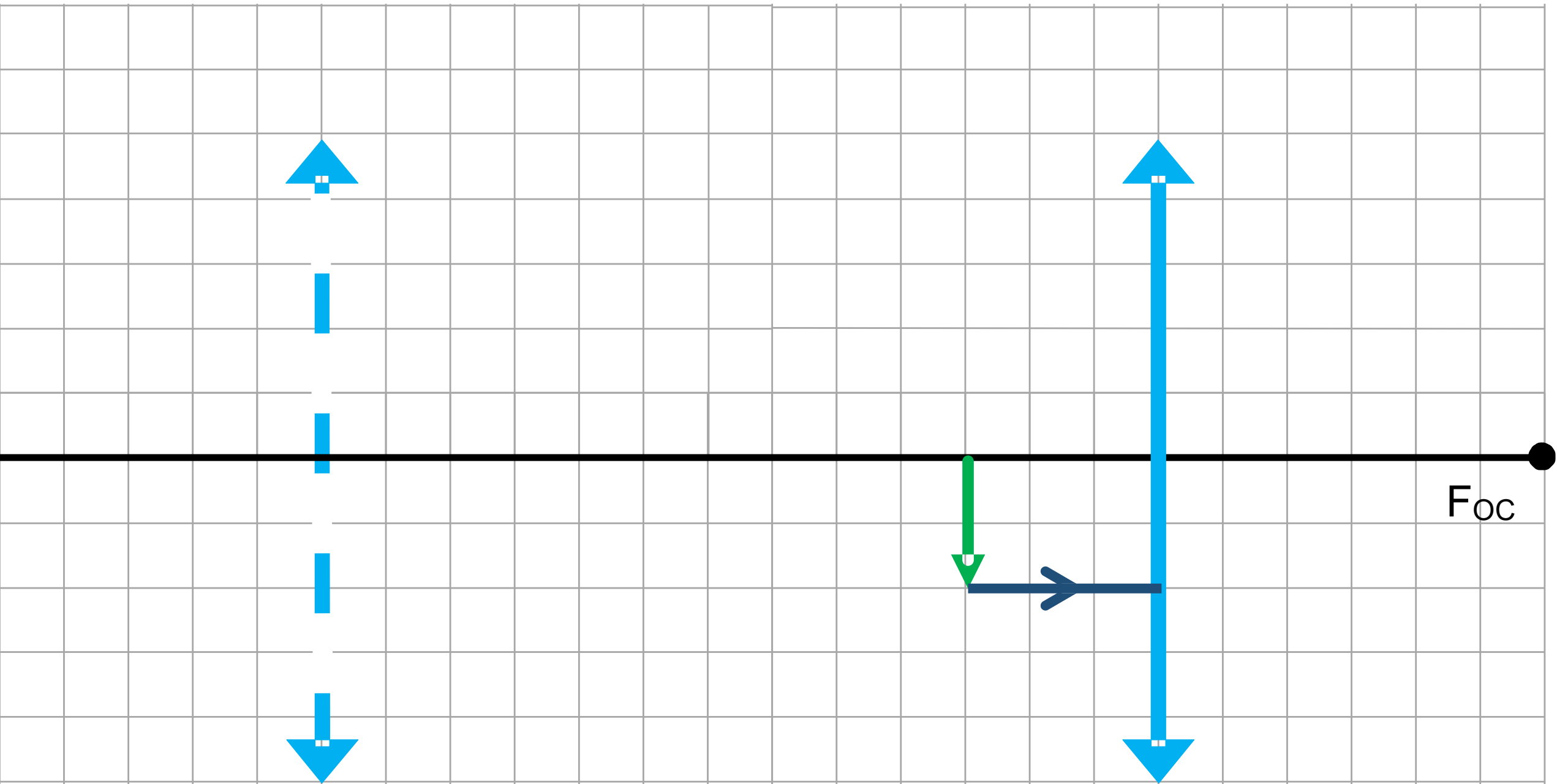


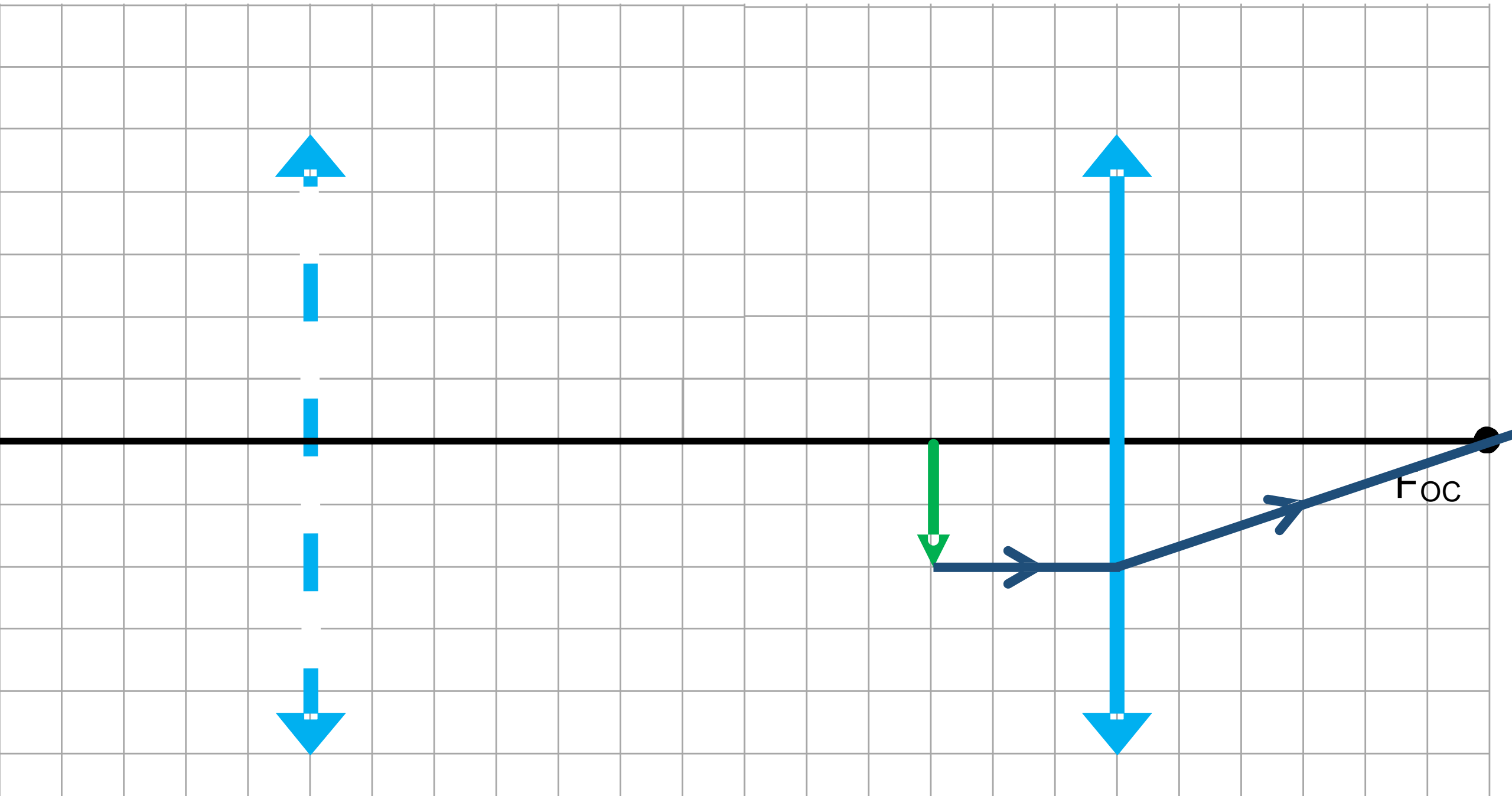


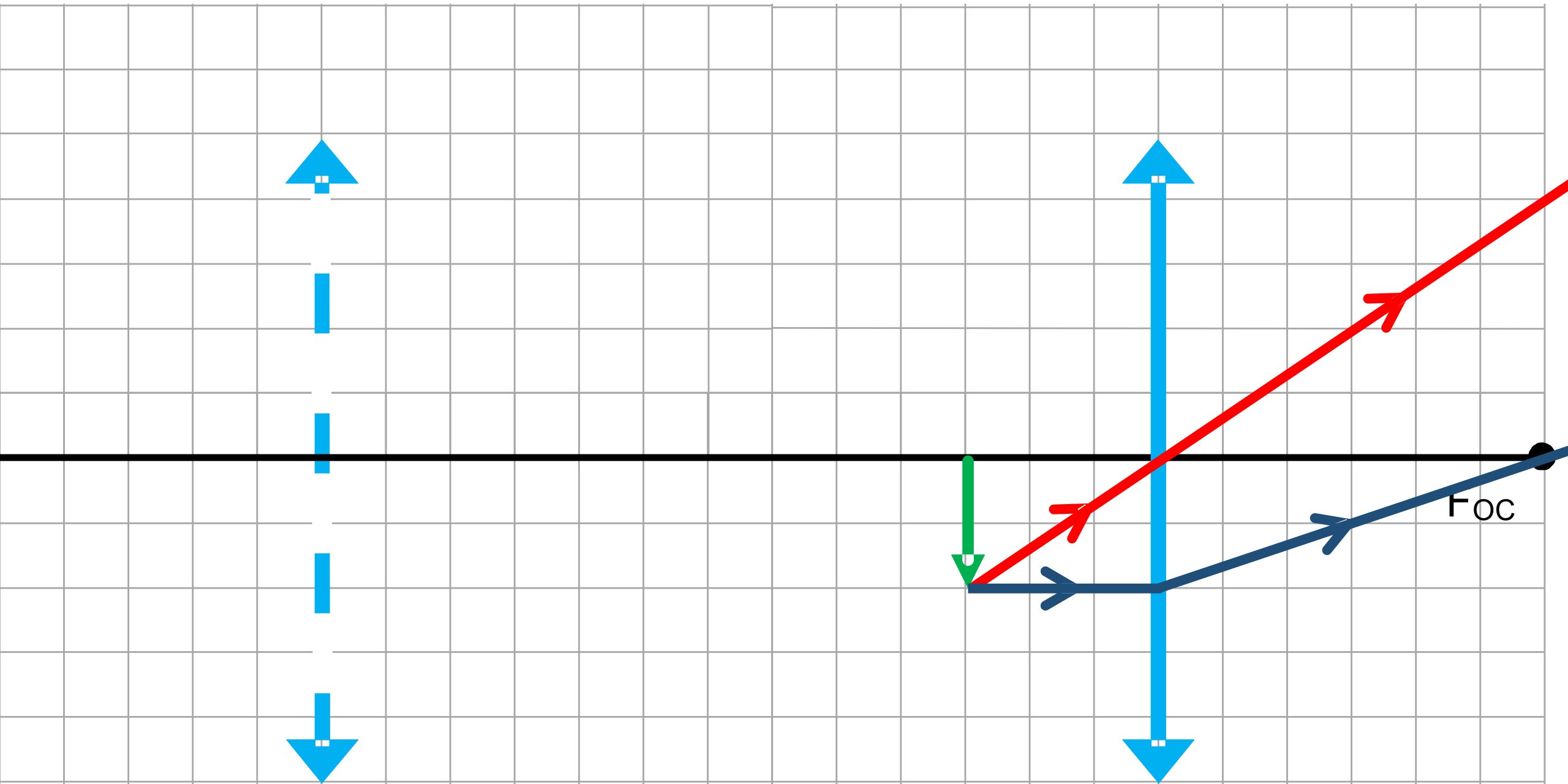


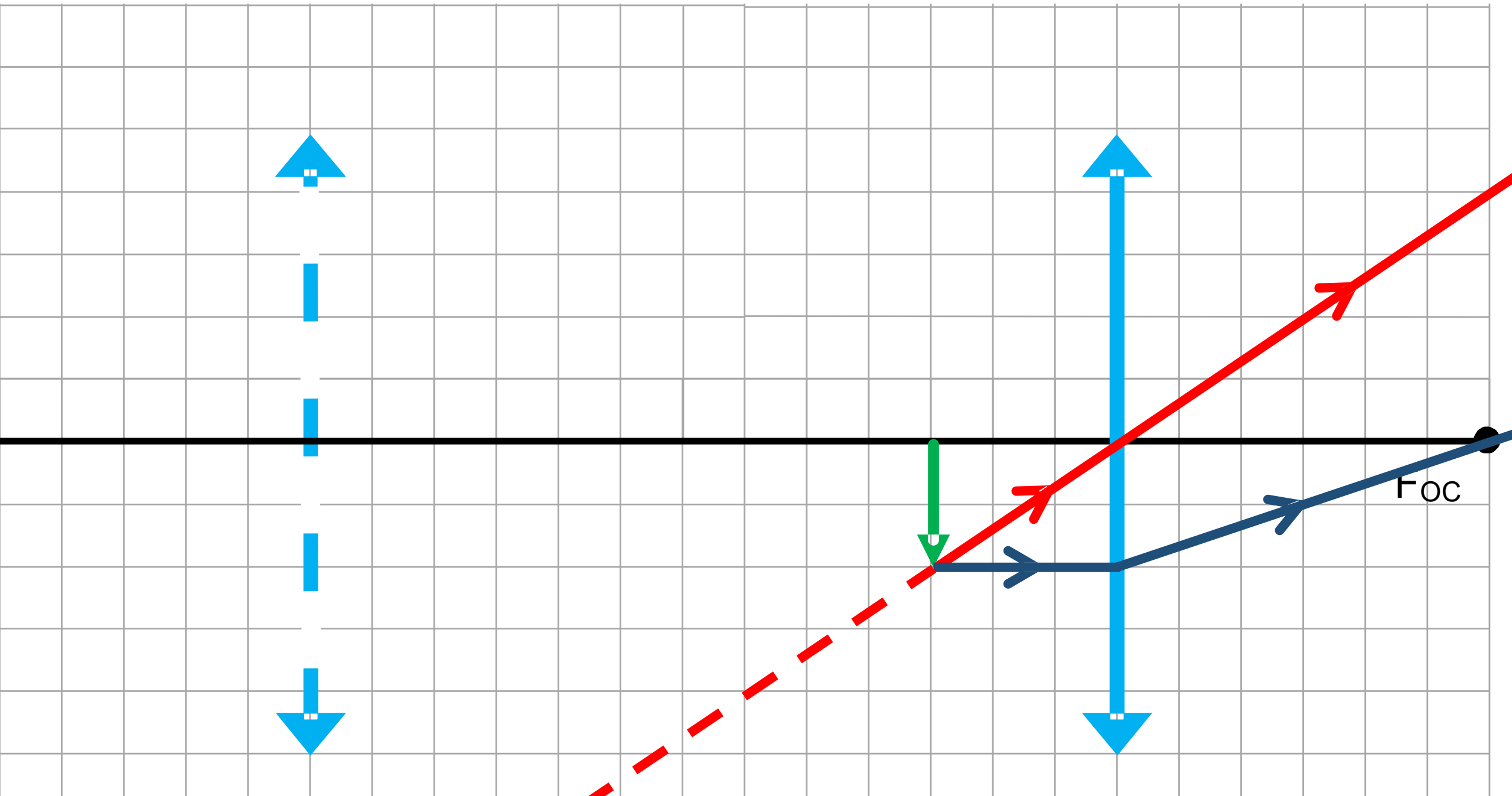


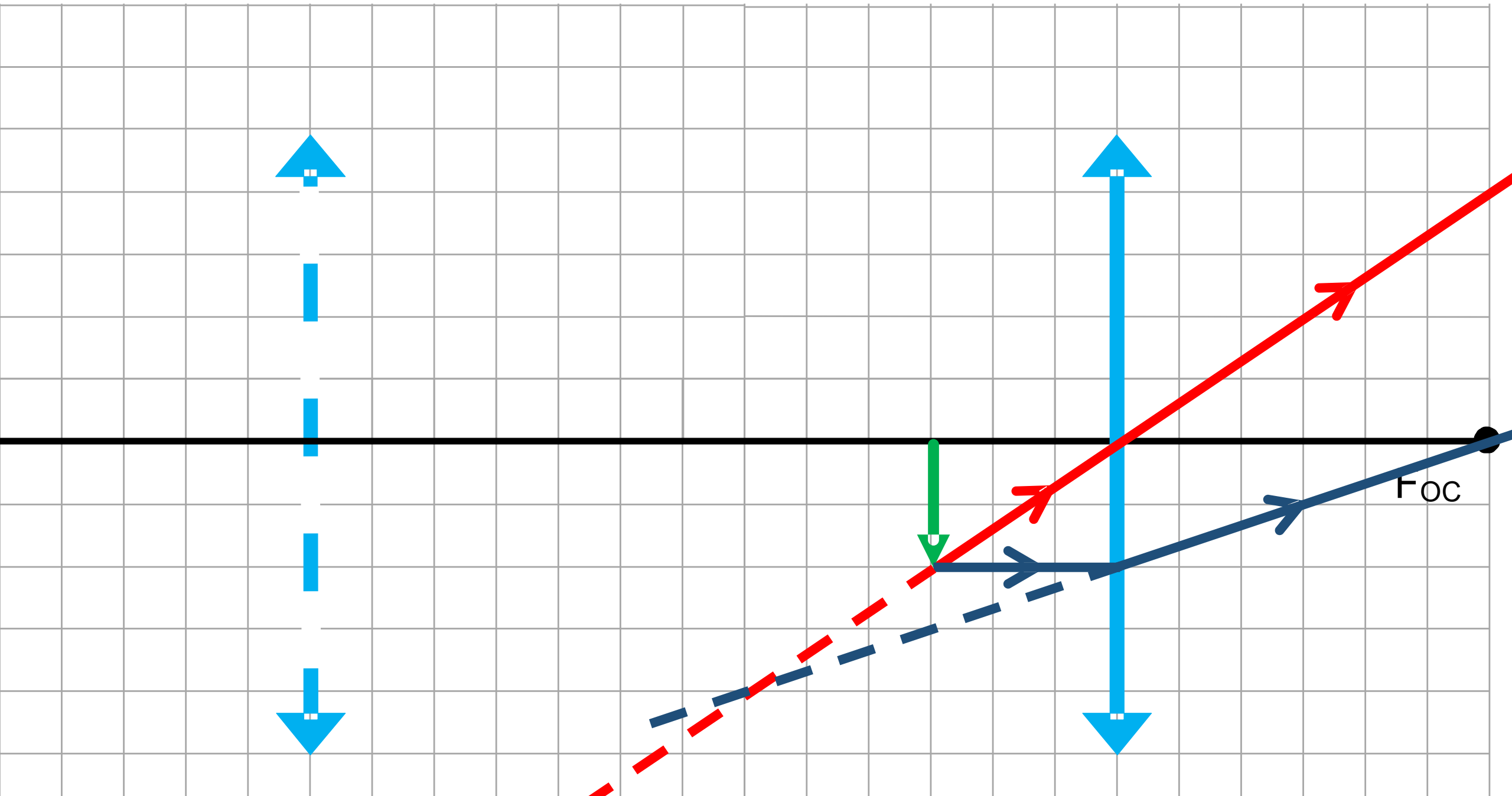


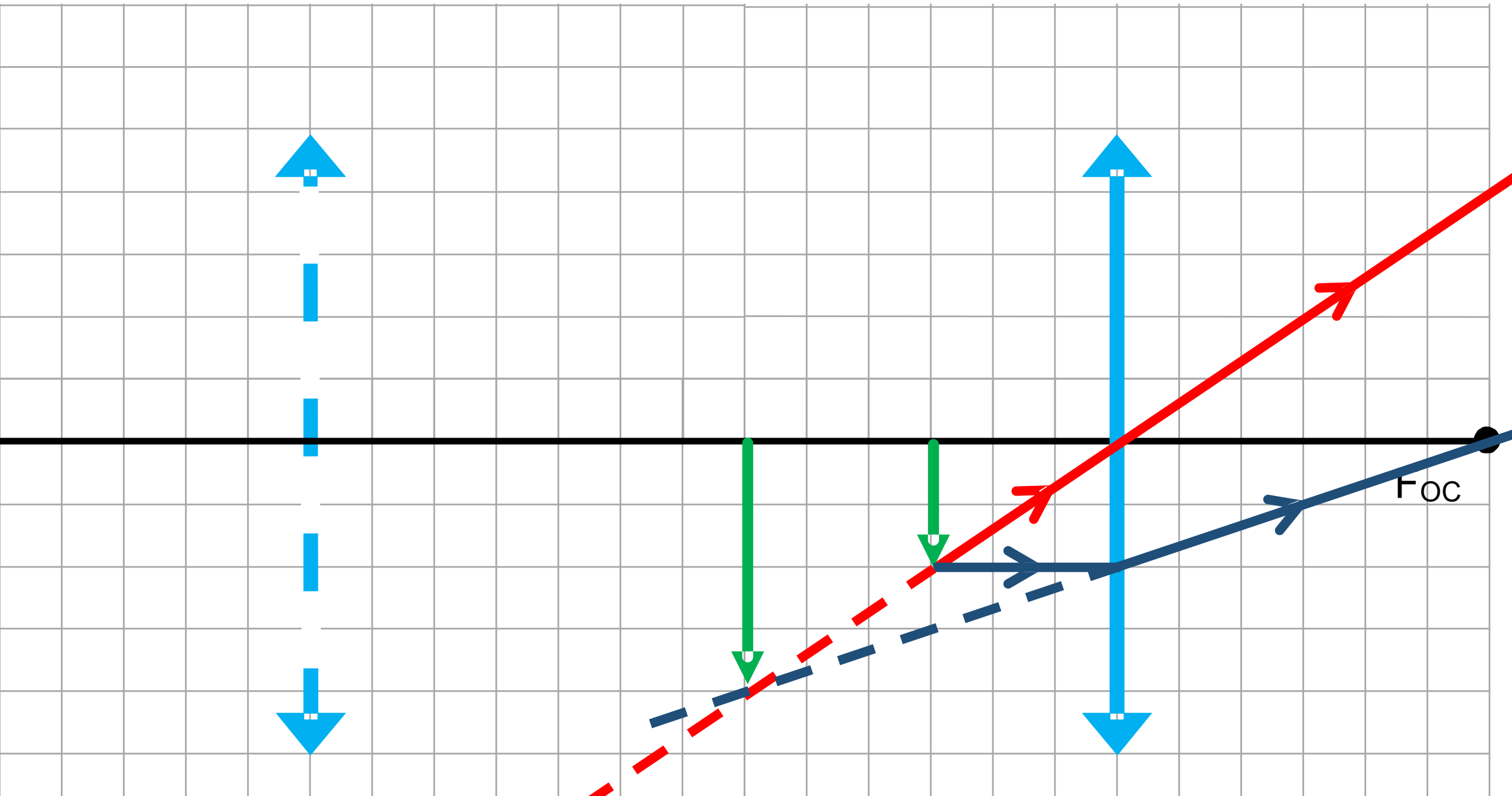


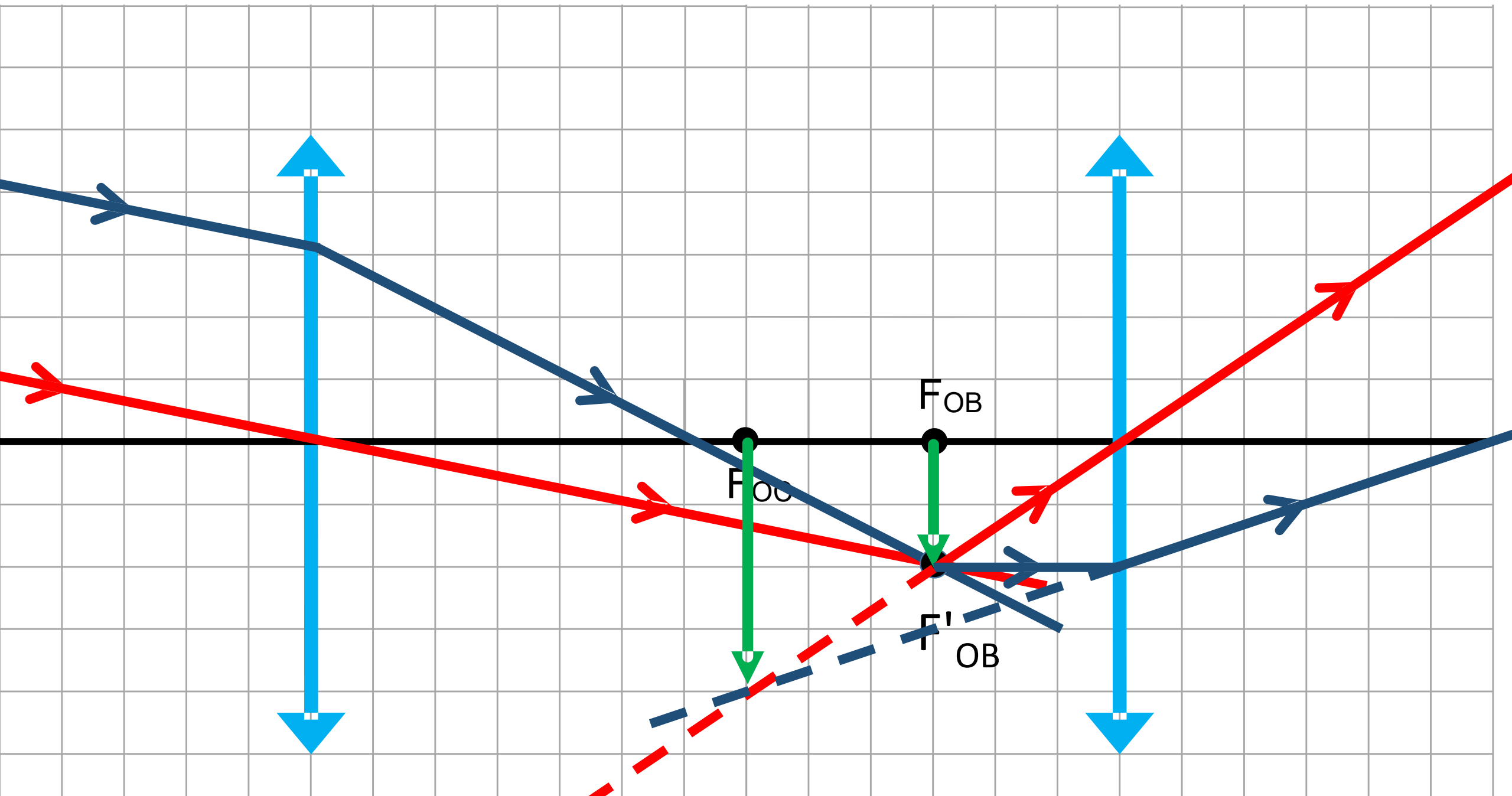












LUNETAS ASTRONÔMICAS

LUNETAS ASTRONÔMICAS

- IMAGEM:

LUNETAS ASTRONÔMICAS

- IMAGEM:
 - VIRTUAL

LUNETAS ASTRONÔMICAS

- IMAGEM:
 - VIRTUAL
 - INVERTIDA

LUNETAS ASTRONÔMICAS

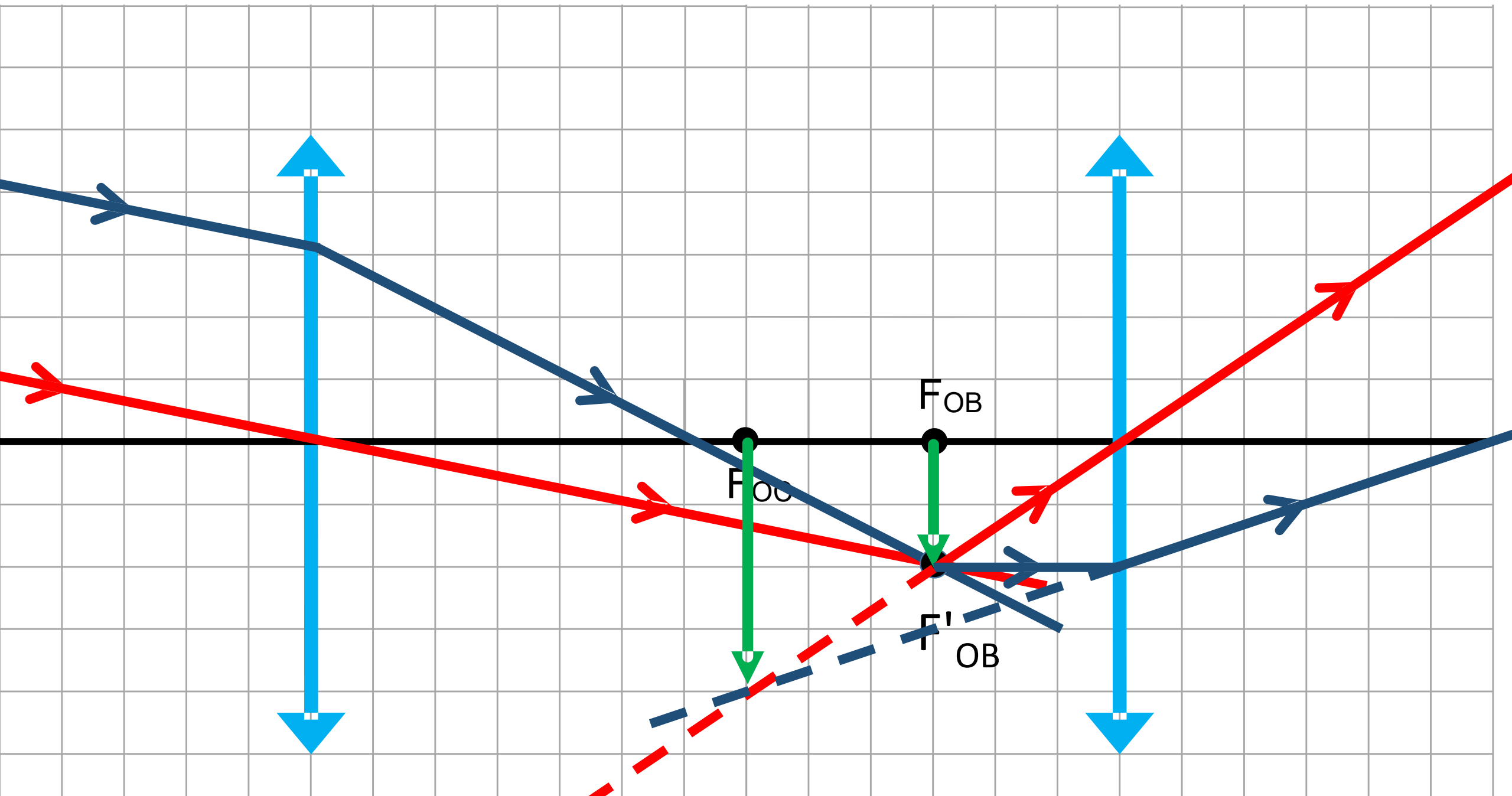
- IMAGEM:
 - VIRTUAL
 - INVERTIDA
 - MAIOR

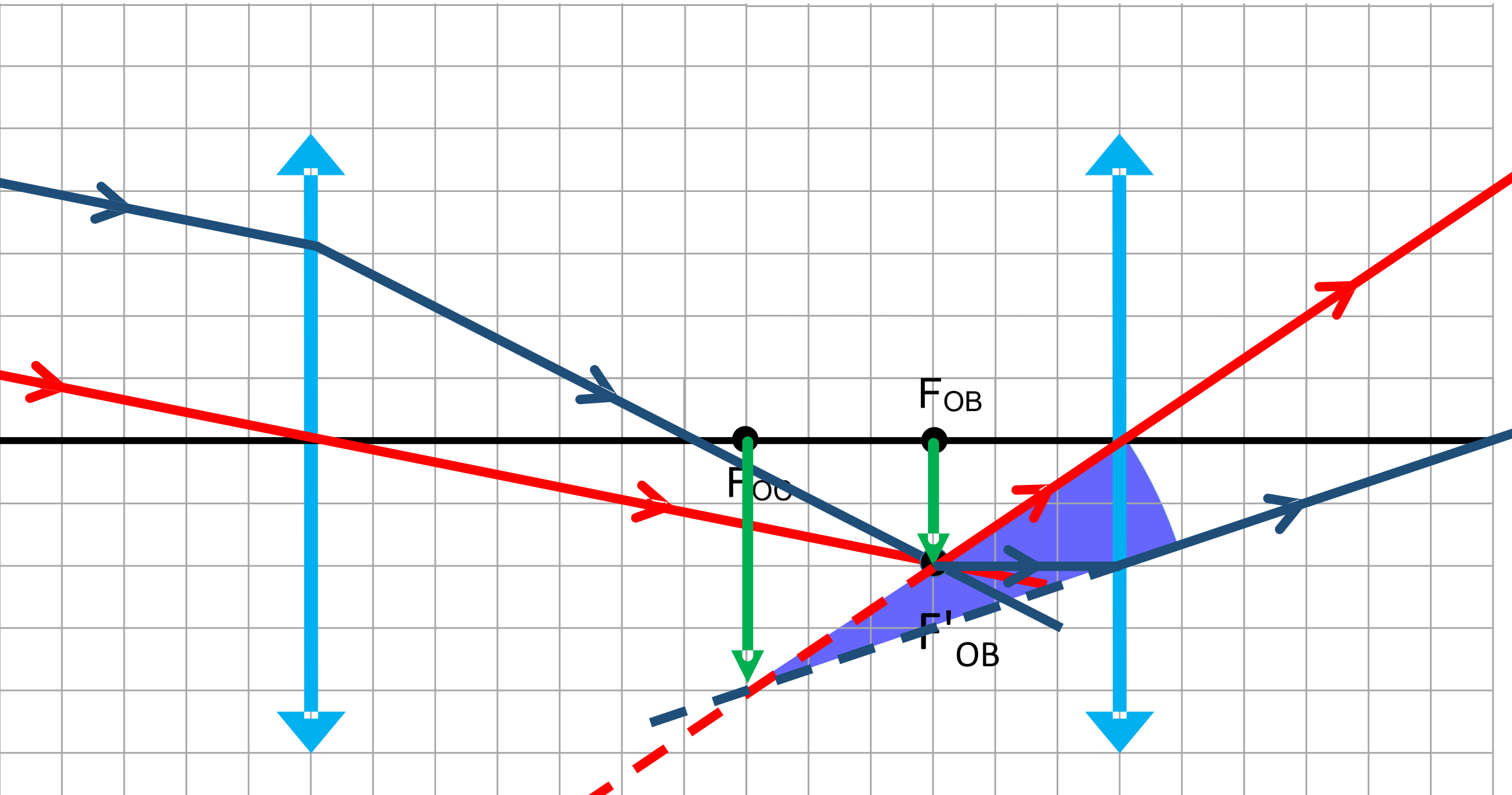
LUNETAS ASTRONÔMICAS

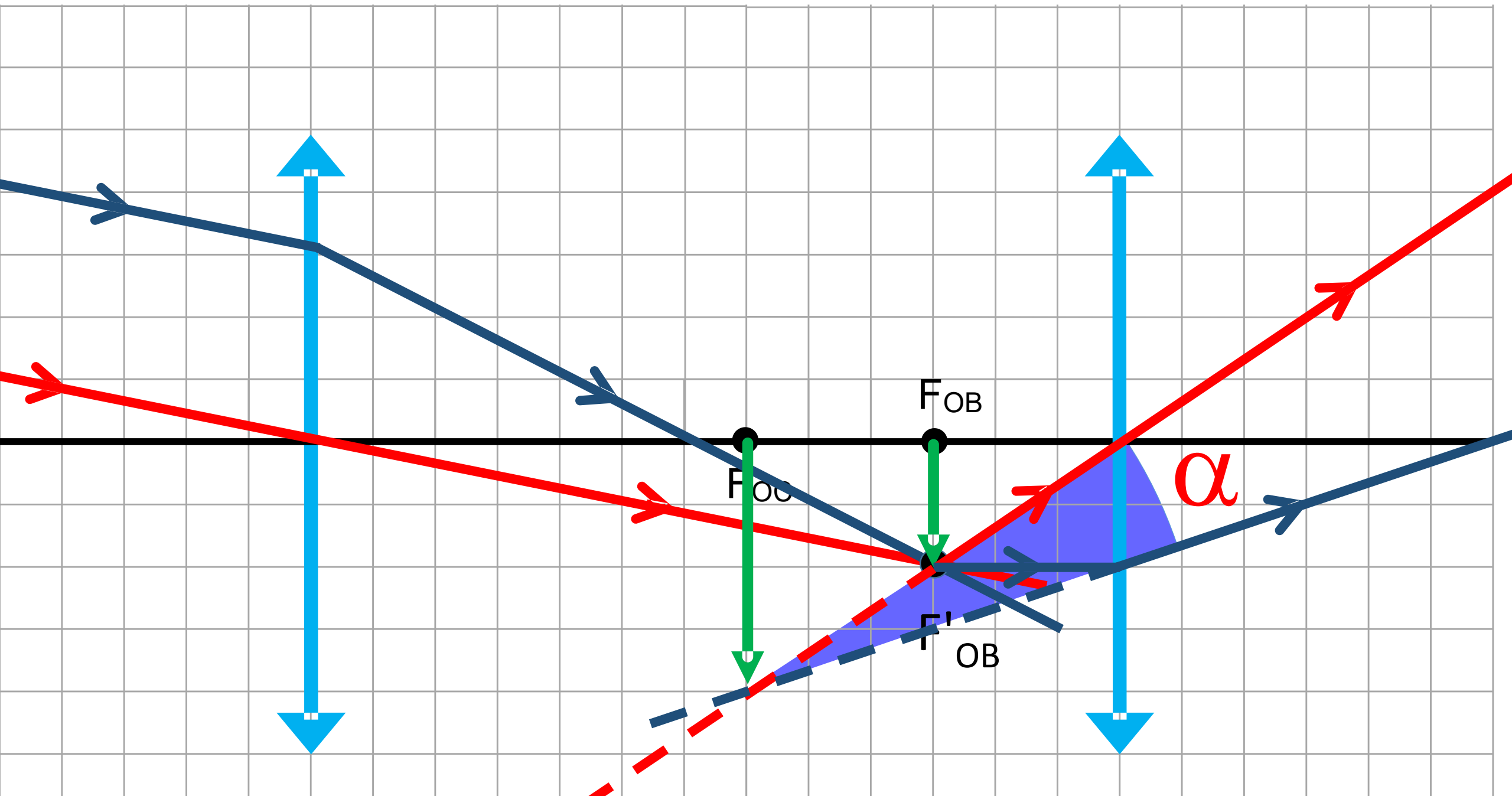
- IMAGEM:
 - VIRTUAL
 - INVERTIDA
 - MAIOR ???

LUNETAS ASTRONÔMICAS

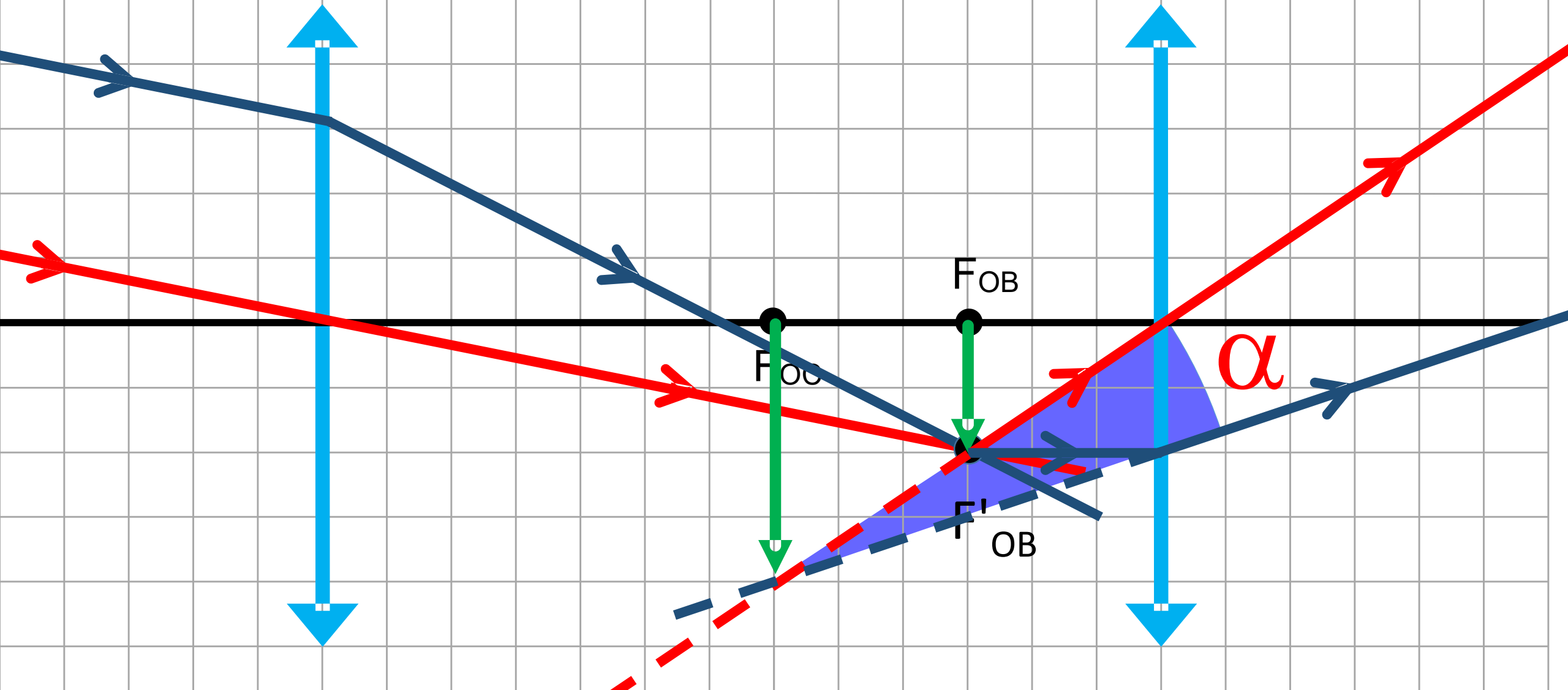
- IMAGEM:
 - VIRTUAL
 - INVERTIDA
 - MAIOR ???
 - Maior aumento angular!!!







A imagem de um objeto é vista sob um ângulo visual maior.



LUNETAS ASTRONÔMICAS

- IMAGEM:
 - VIRTUAL
 - INVERTIDA
 - MAIOR ???
 - Maior aumento angular!!!

LUNETAS ASTRONÔMICAS

- IMAGEM:
 - VIRTUAL
 - INVERTIDA
 - MAIOR ???
 - Maior aumento angular!!!
- Como a imagem é invertida, a luneta astronômica não é usada como luneta terrestre

LUNETAS ASTRONÔMICAS

- IMAGEM:
 - VIRTUAL
 - INVERTIDA
 - MAIOR ???
 - Maior aumento angular!!!
- Como a imagem é invertida, não é usada como luneta terrestre



LUNETAS ASTRONÔMICAS

- IMAGEM:
 - VIRTUAL
 - INVERTIDA
 - MAIOR ???
 - Maior aumento angular!!!
- Como a imagem é invertida, não é usada como luneta terrestre
- Imagem final semelhante ao do Telescópio



TELESCÓPIO

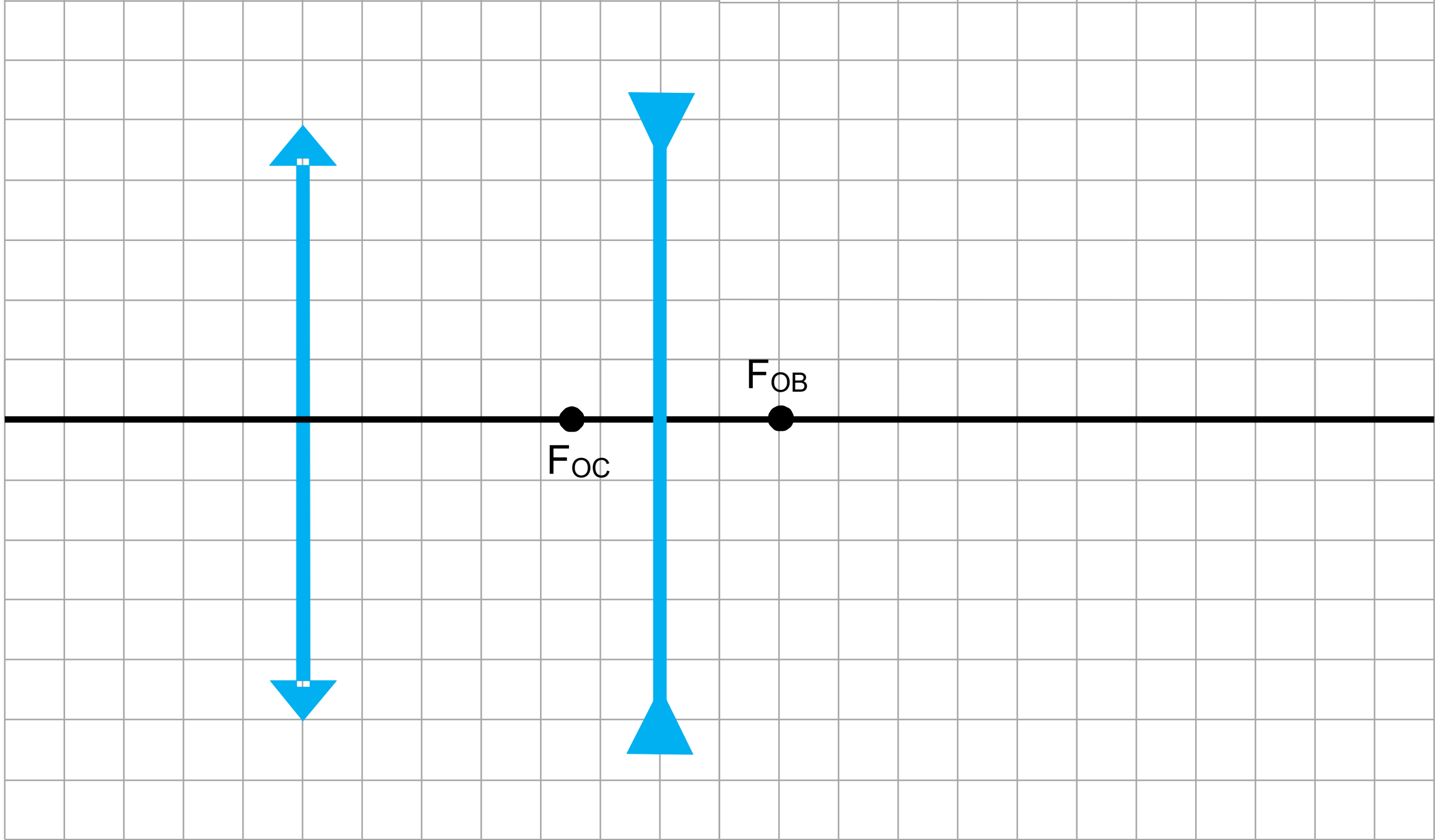
- Semelhante à Luneta astronômica. Portanto:

TELESCÓPIO

- Semelhante à Luneta astronômica. Portanto:
- IMAGEM:
 - VIRTUAL
 - INVERTIDA
 - MAIOR ???
 - Maior aumento angular!!!
- Como a imagem é invertida, não é usada como luneta terrestre



LUNETTA TERRESTRE

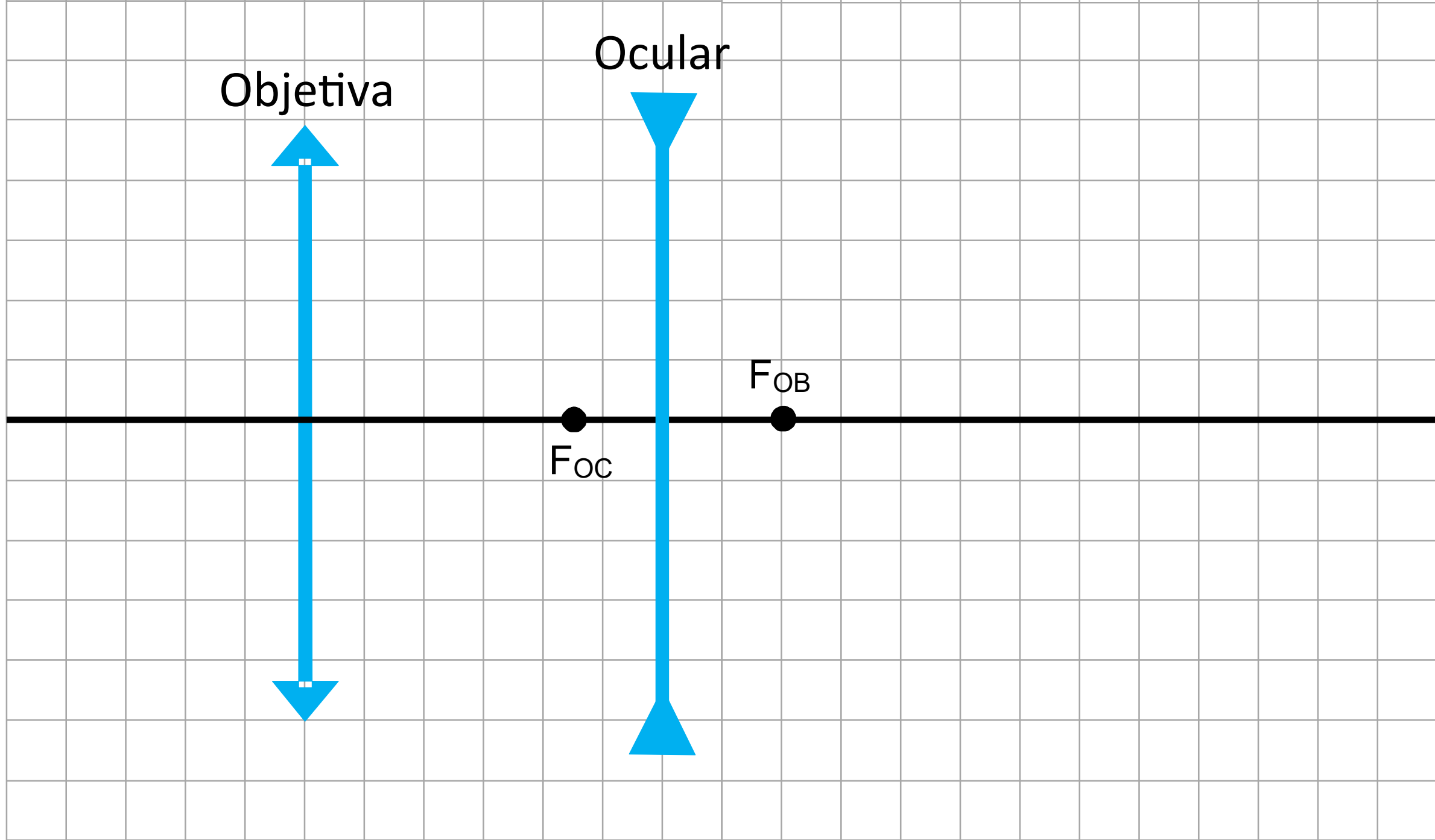


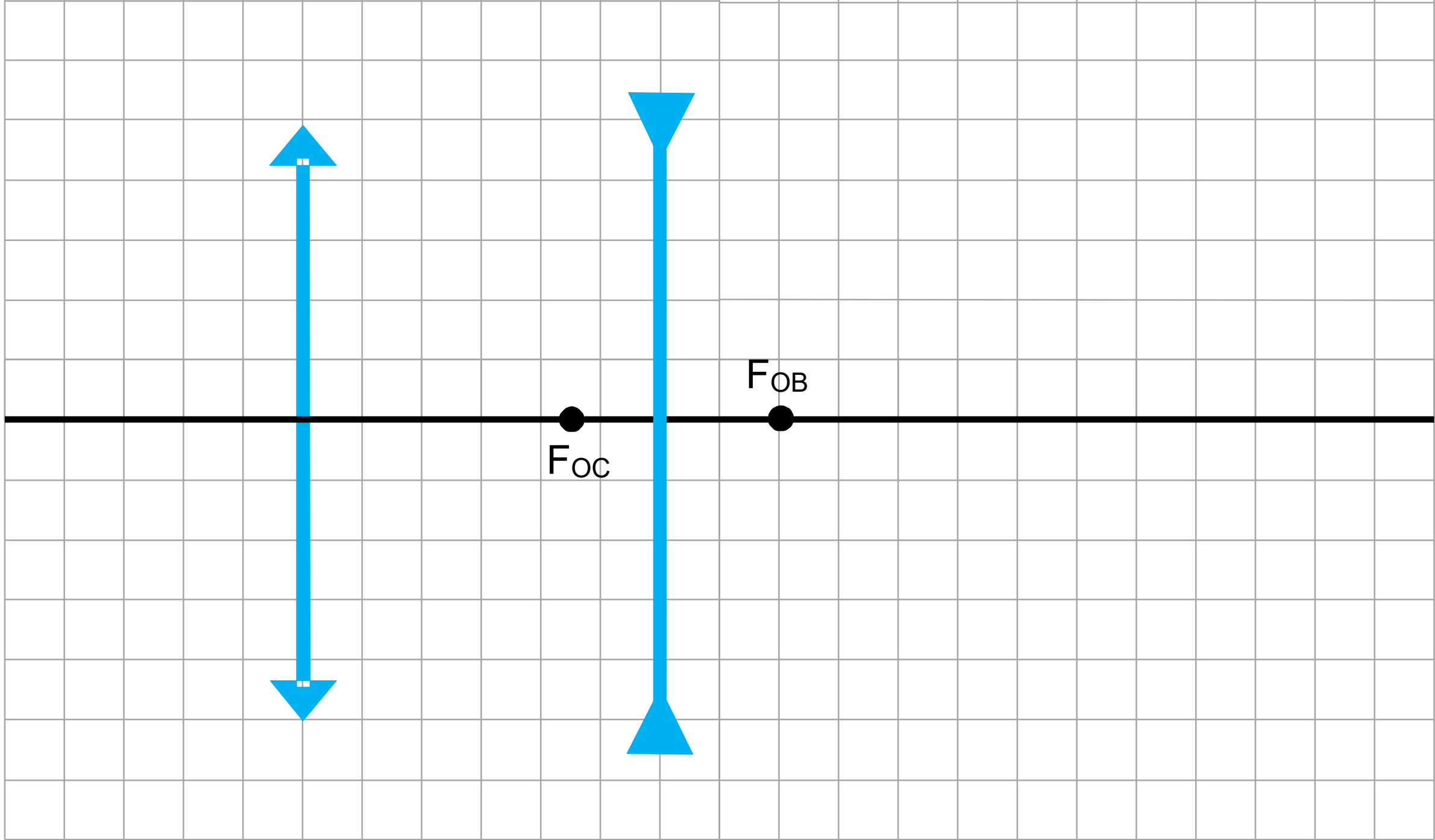
Objetiva

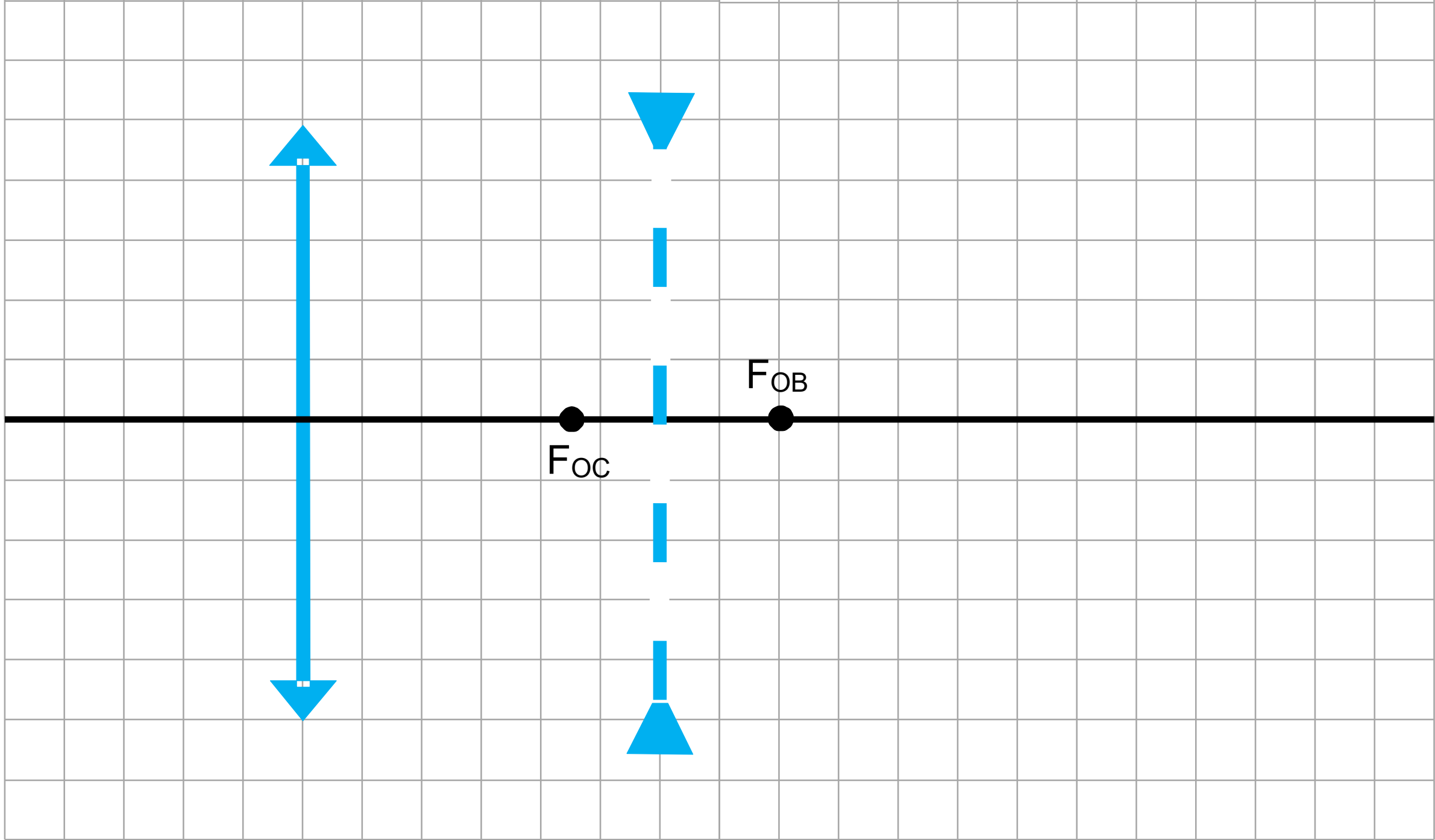
Ocular

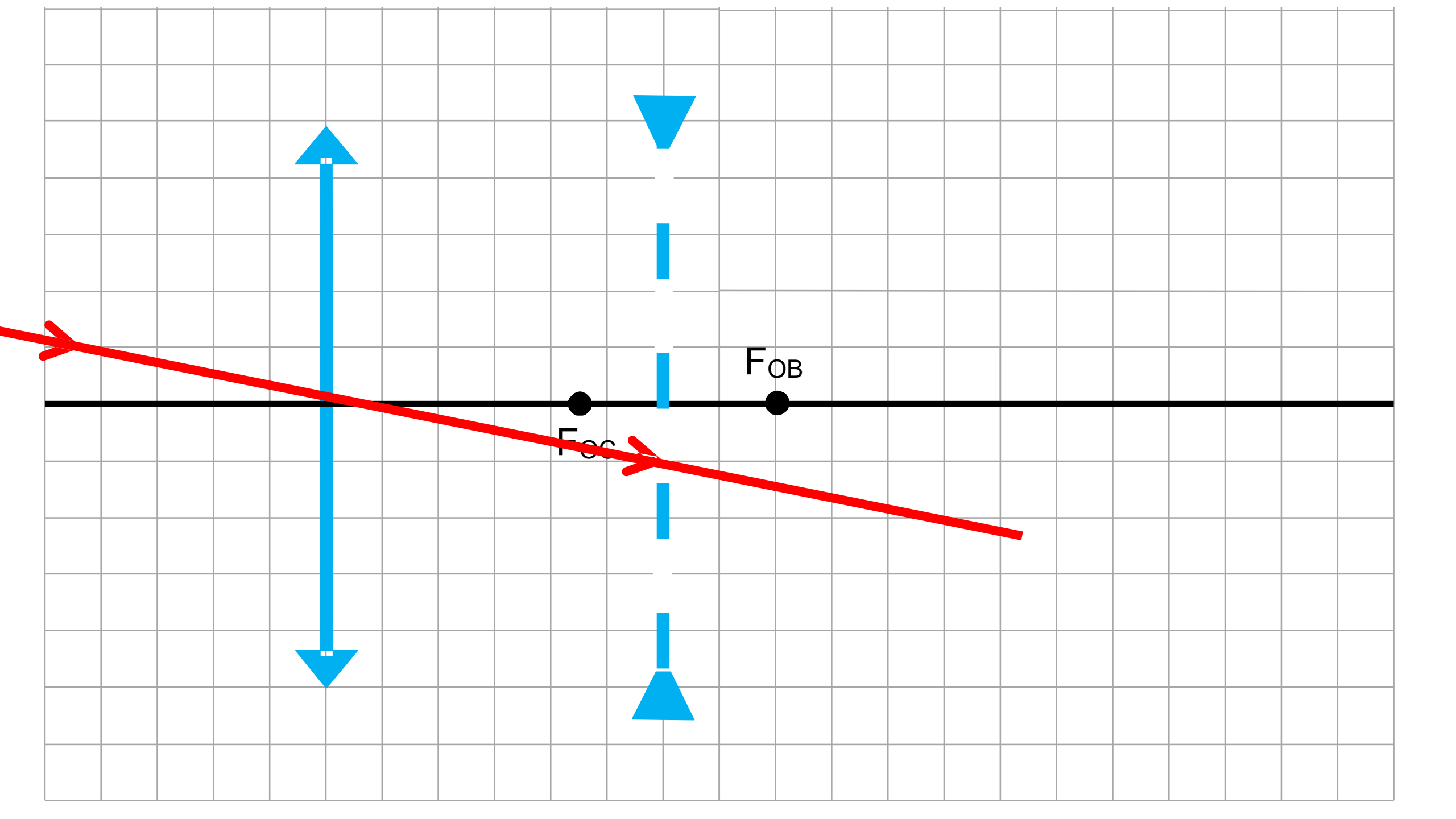
F_{OB}

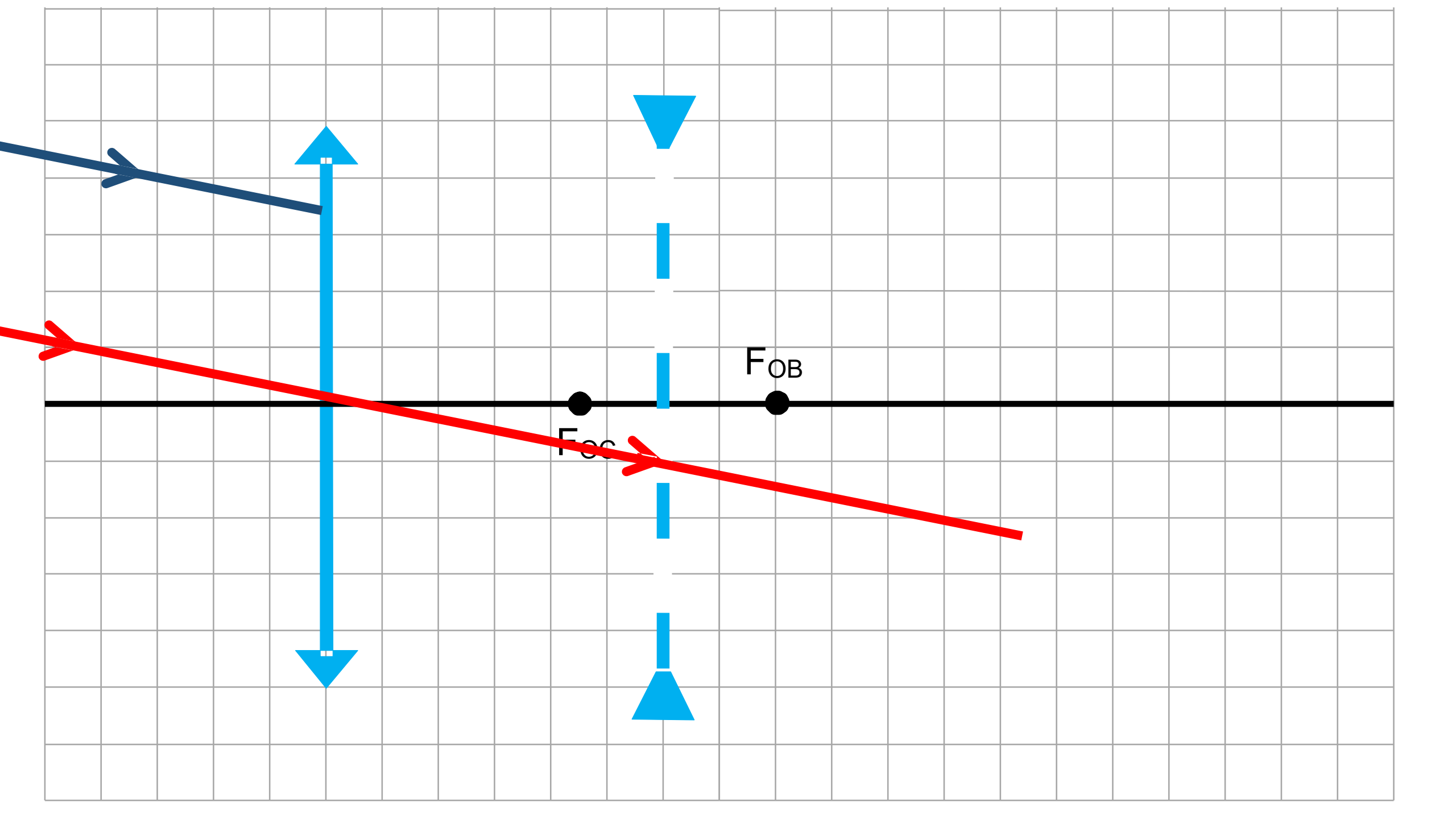
F_{OC}

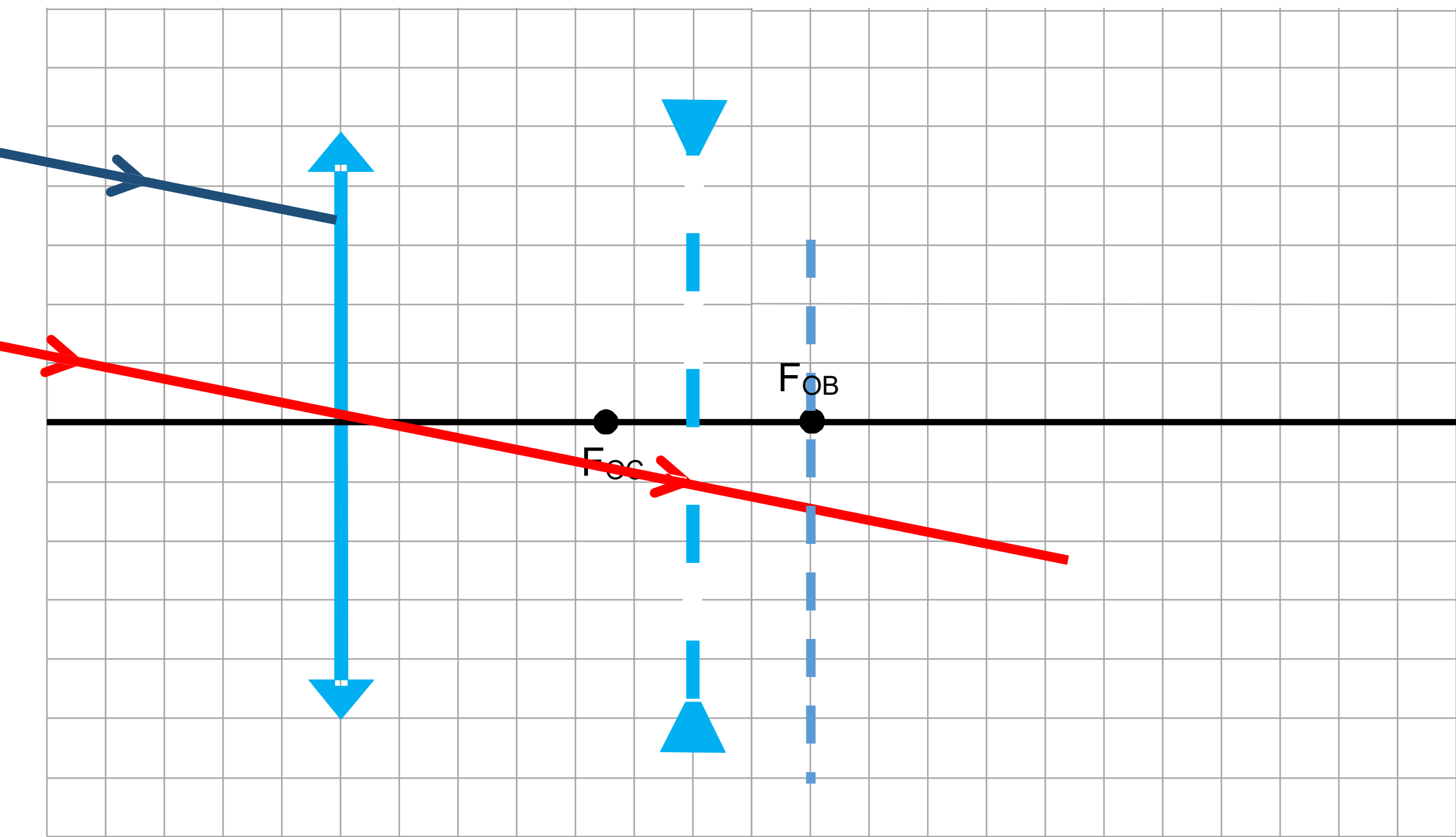


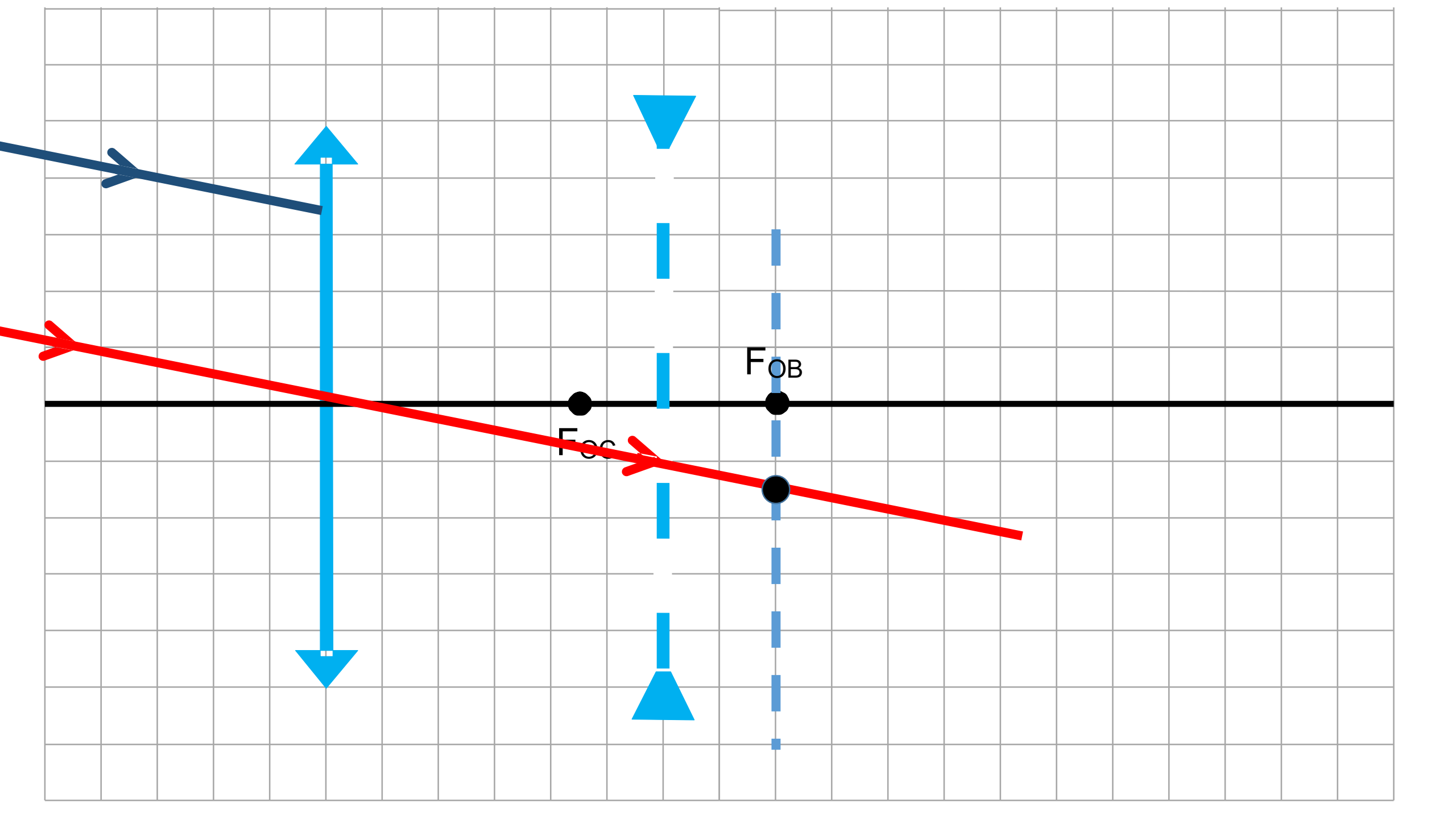


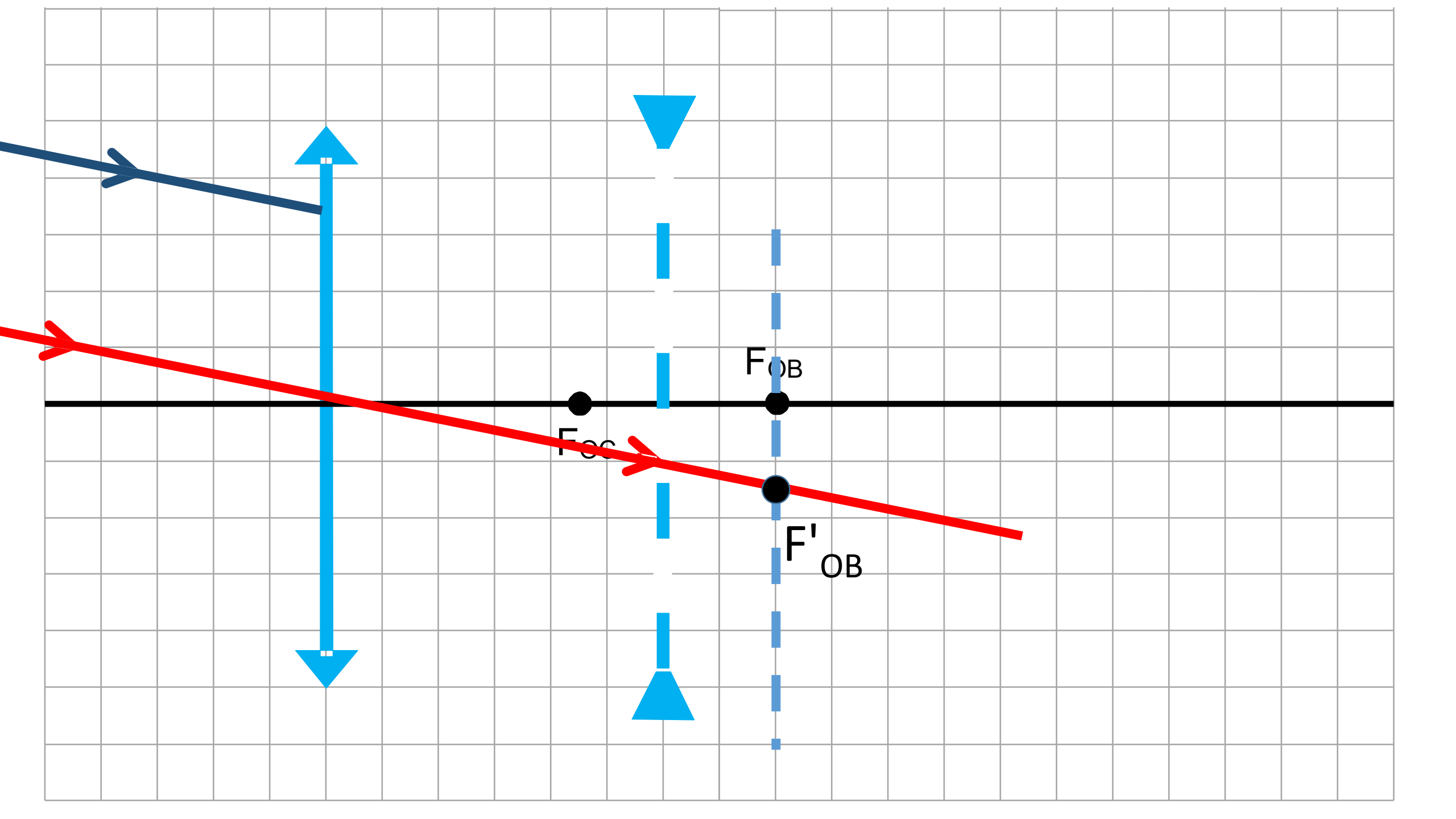


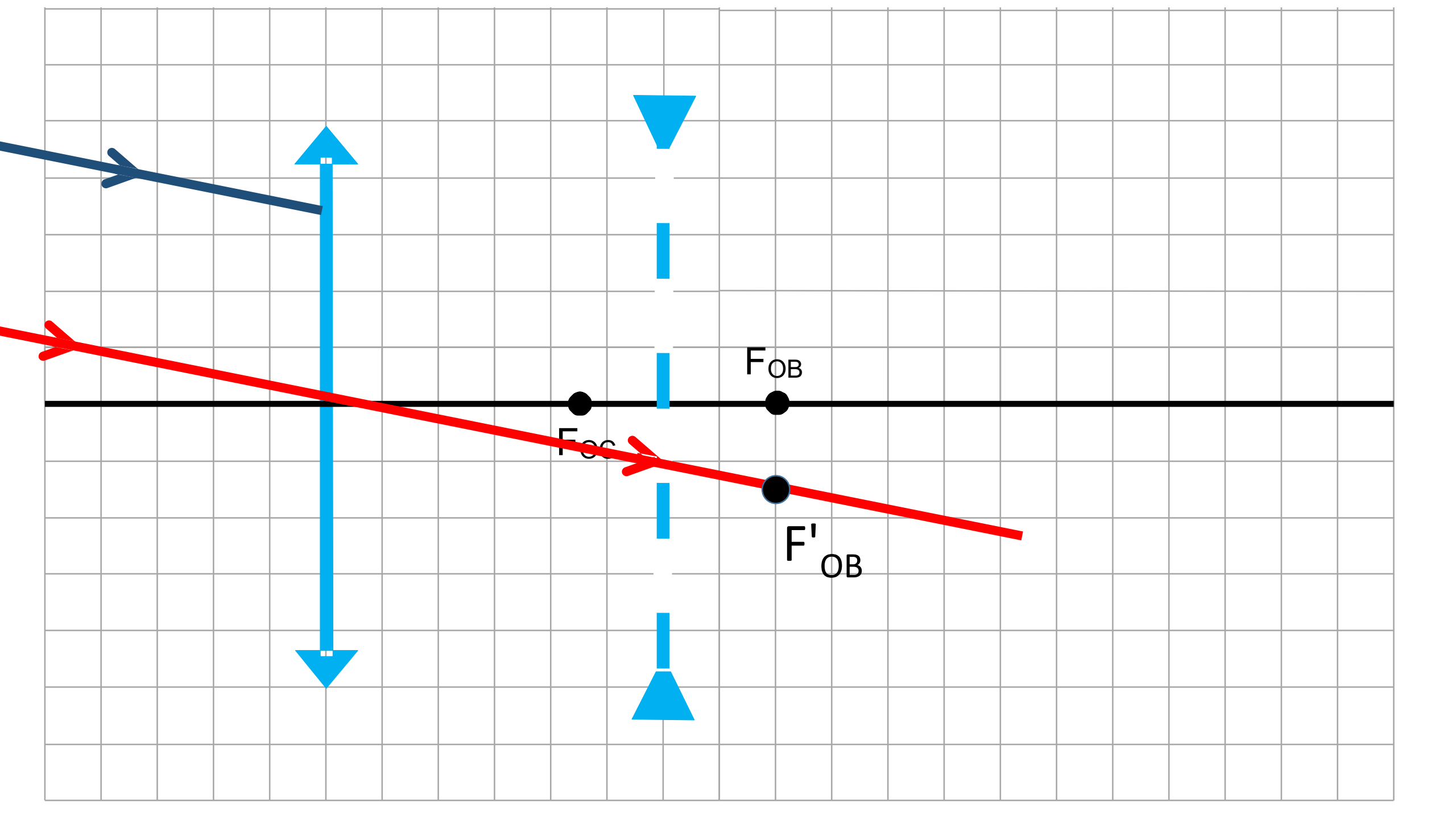


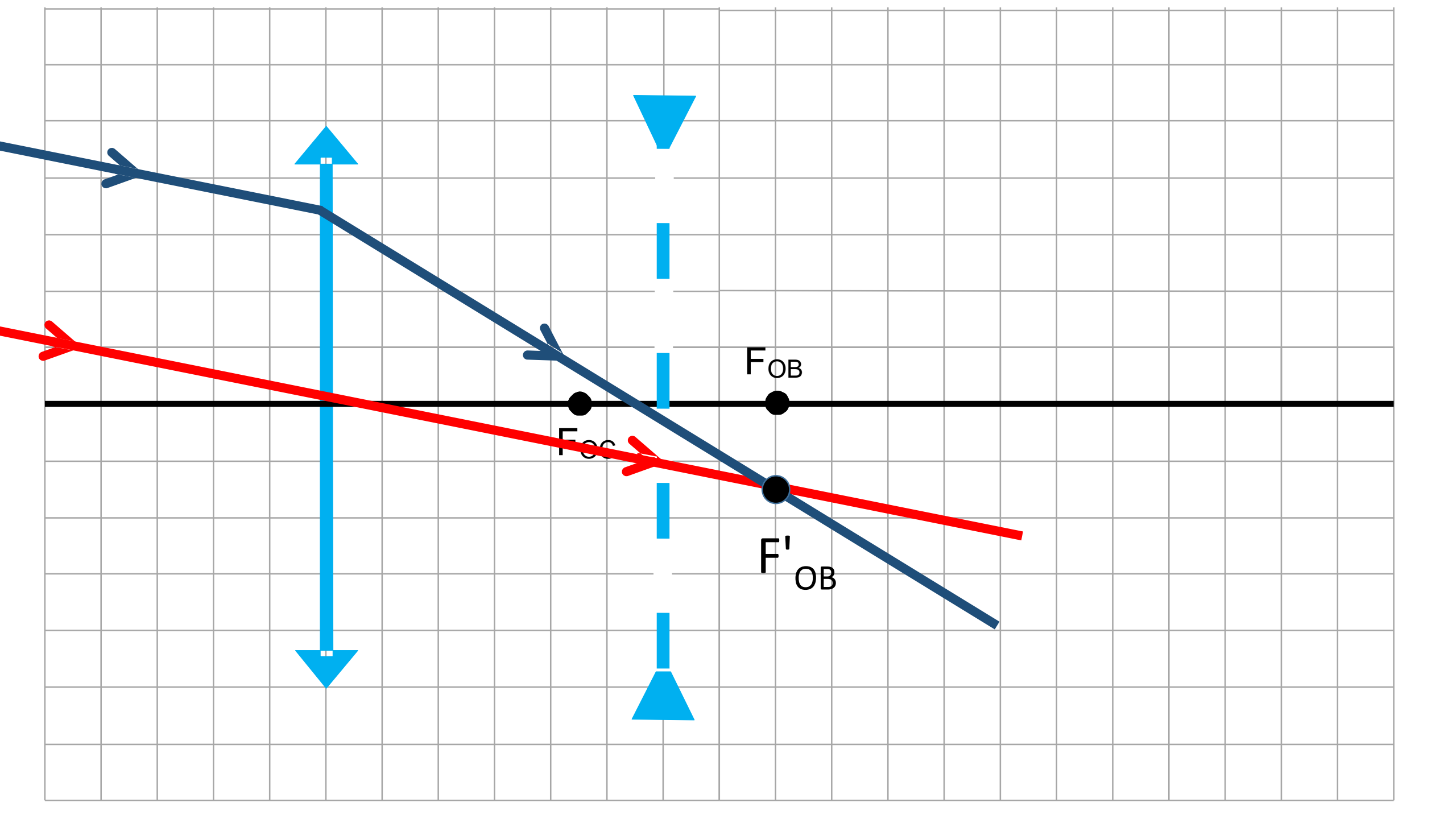


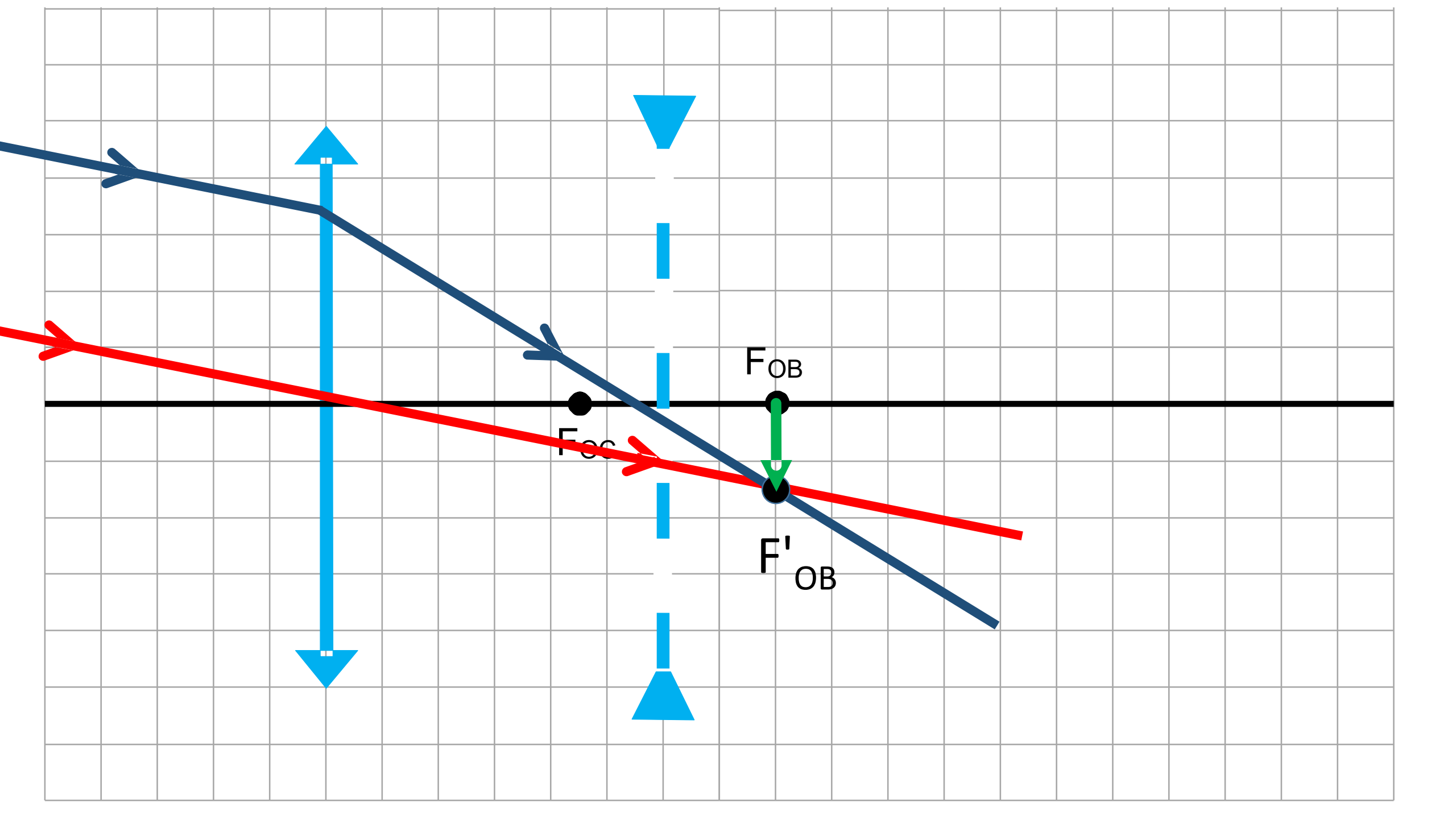


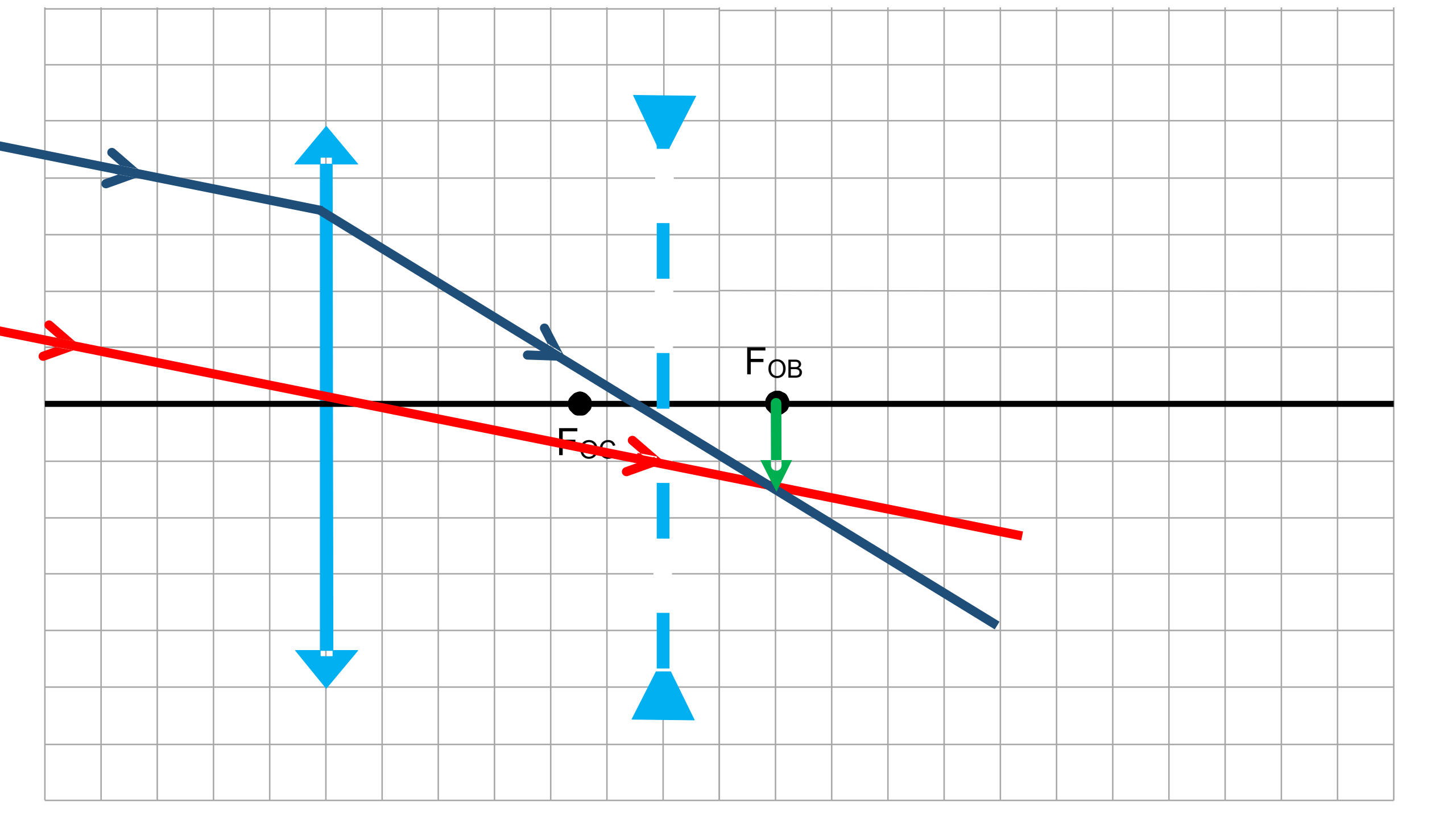


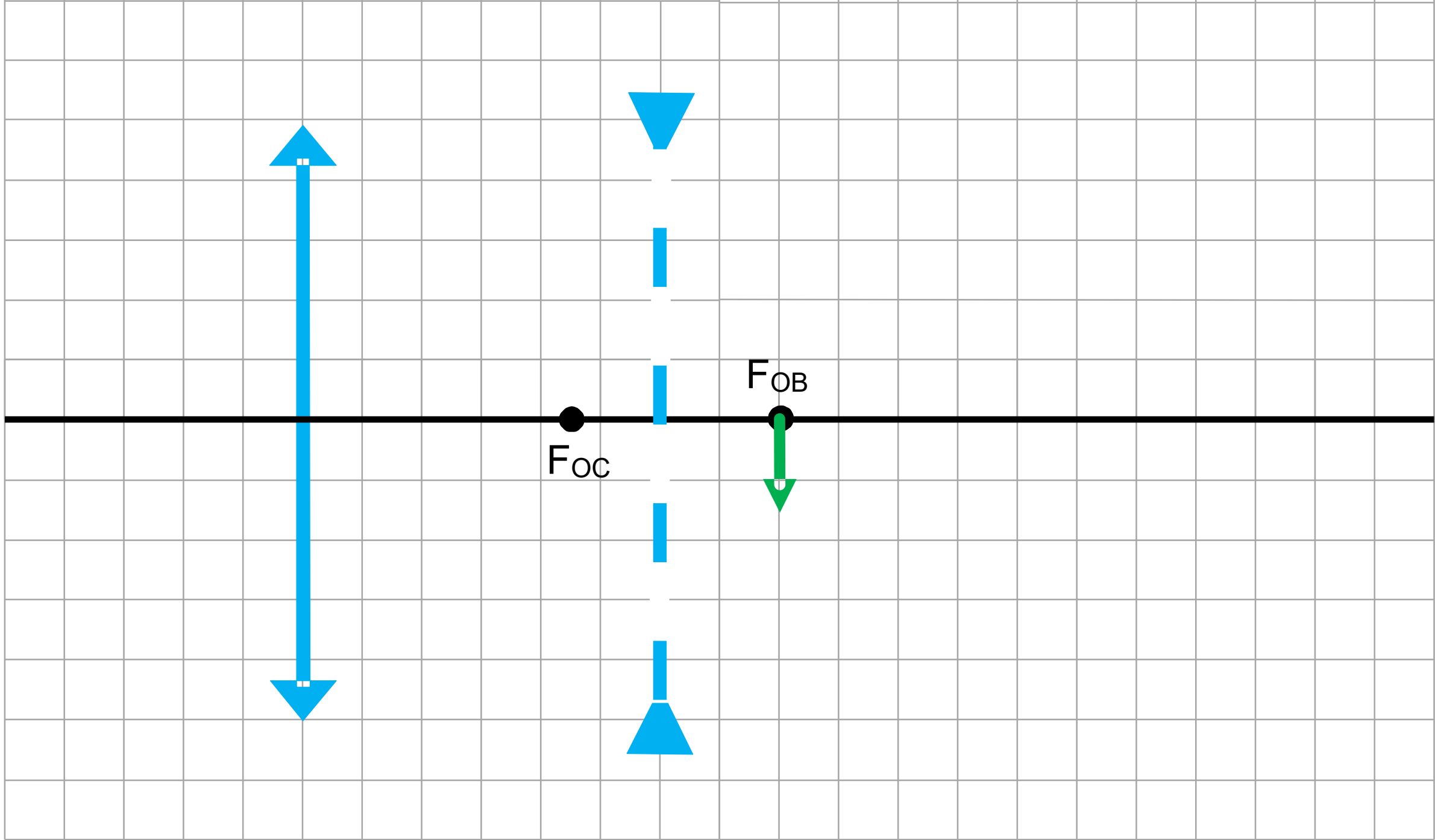


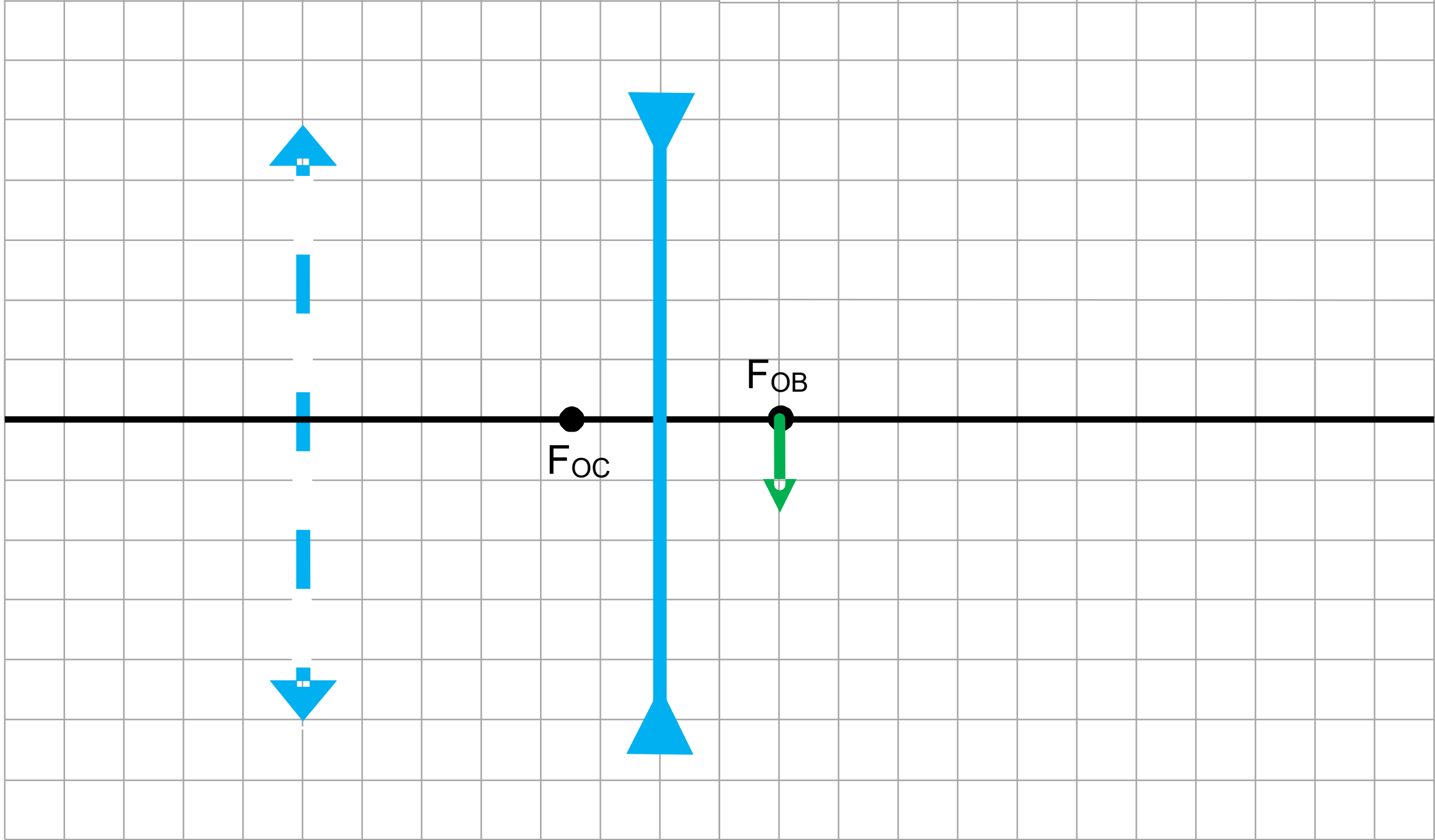


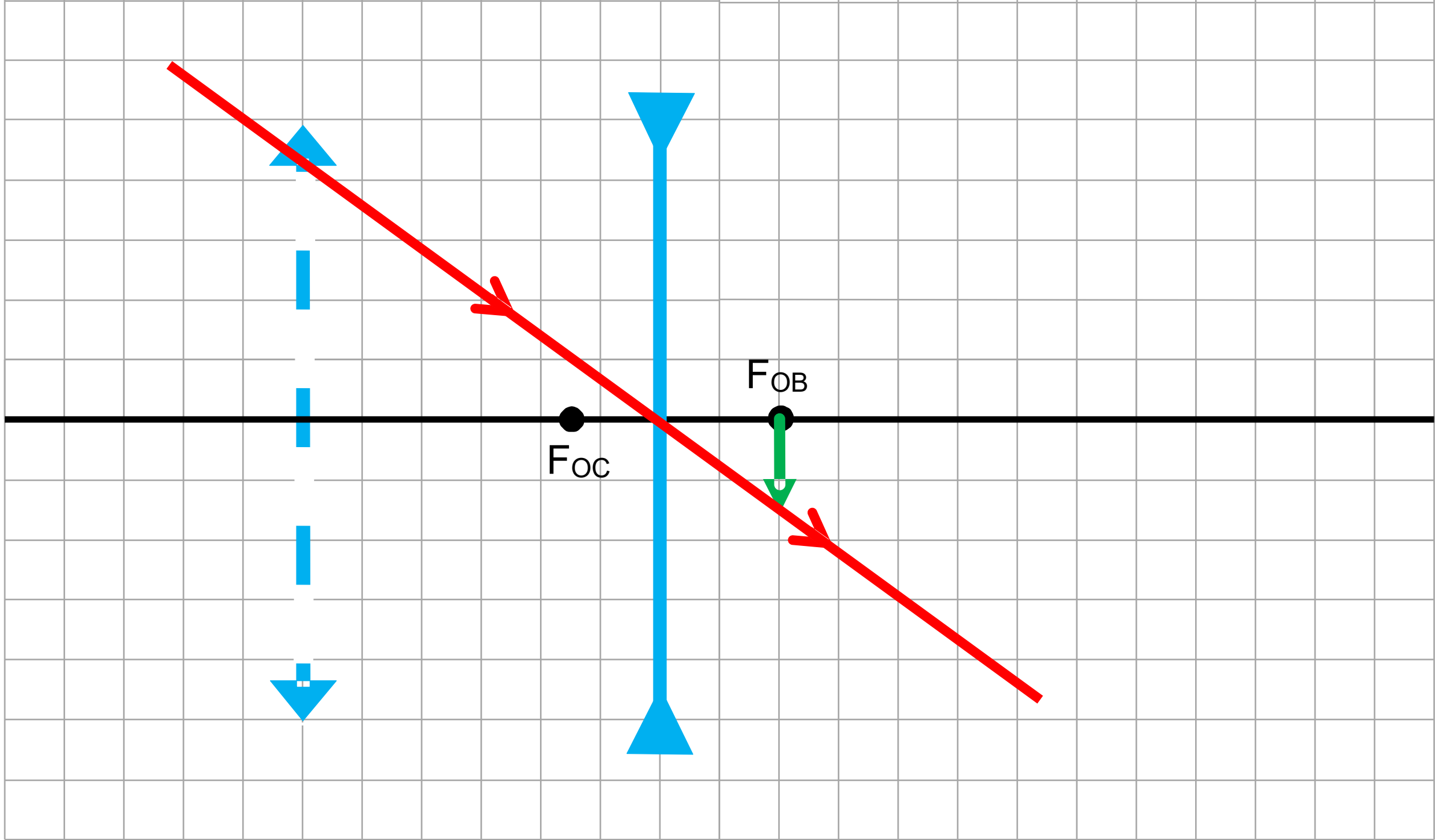


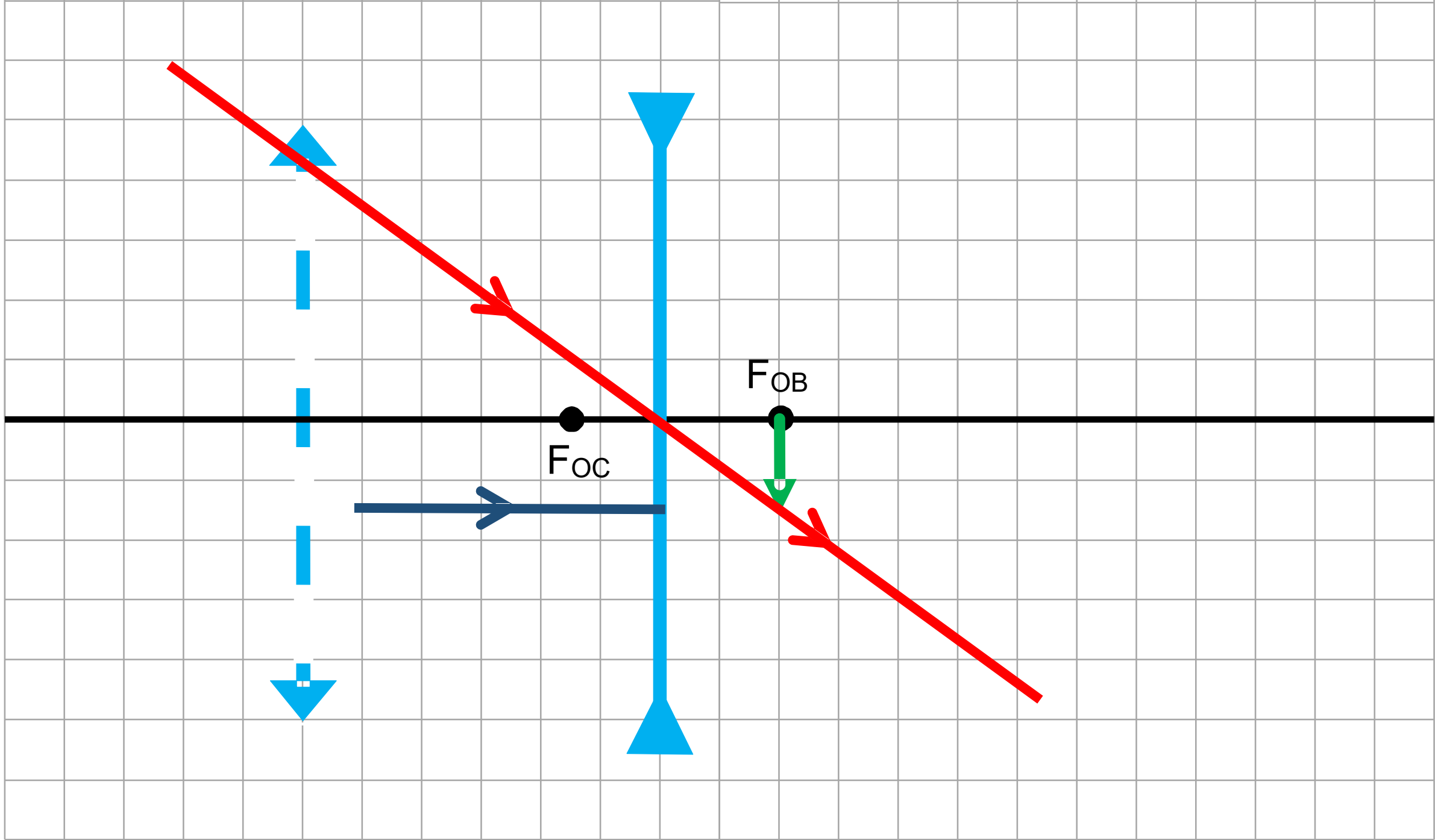


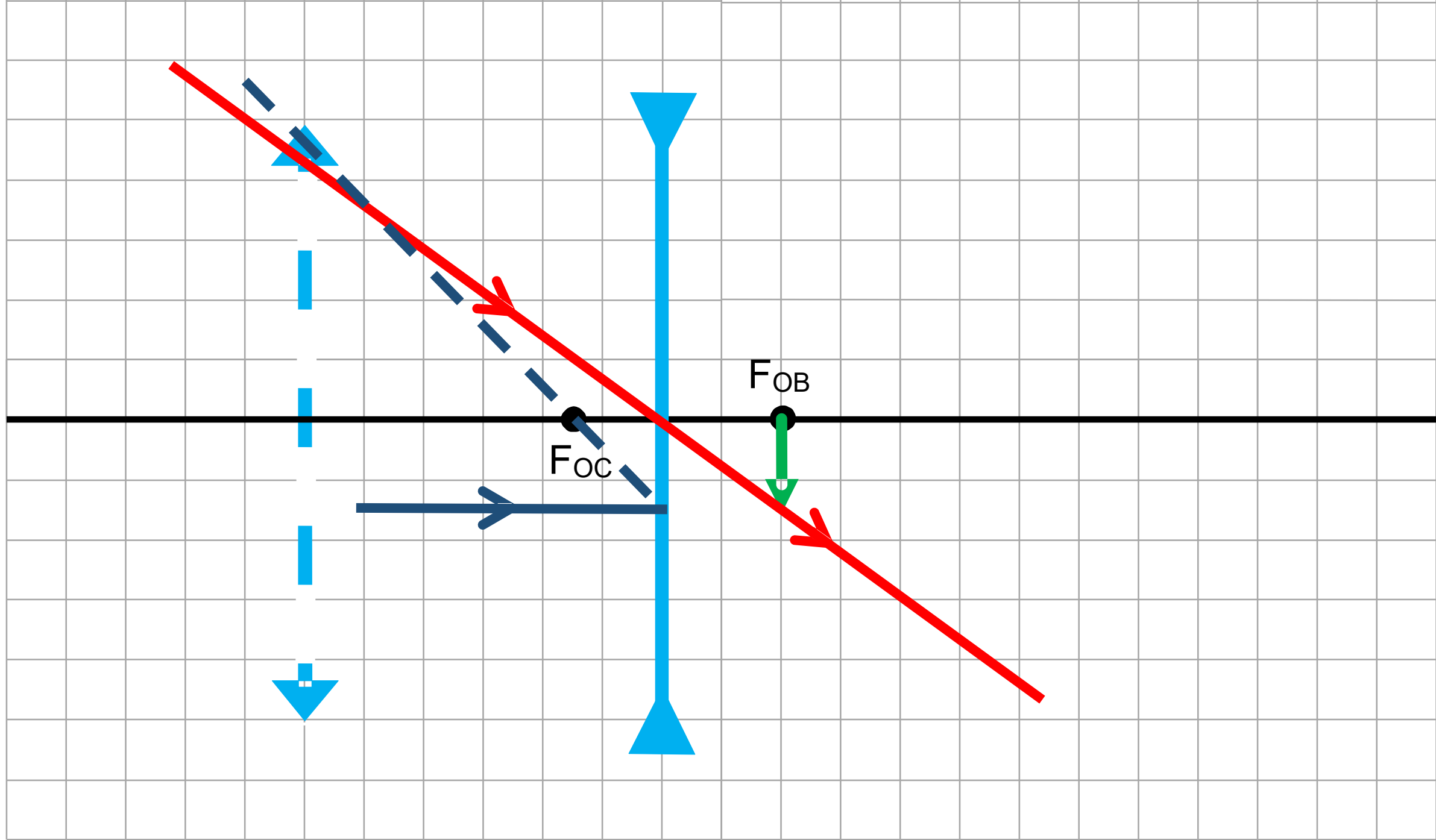


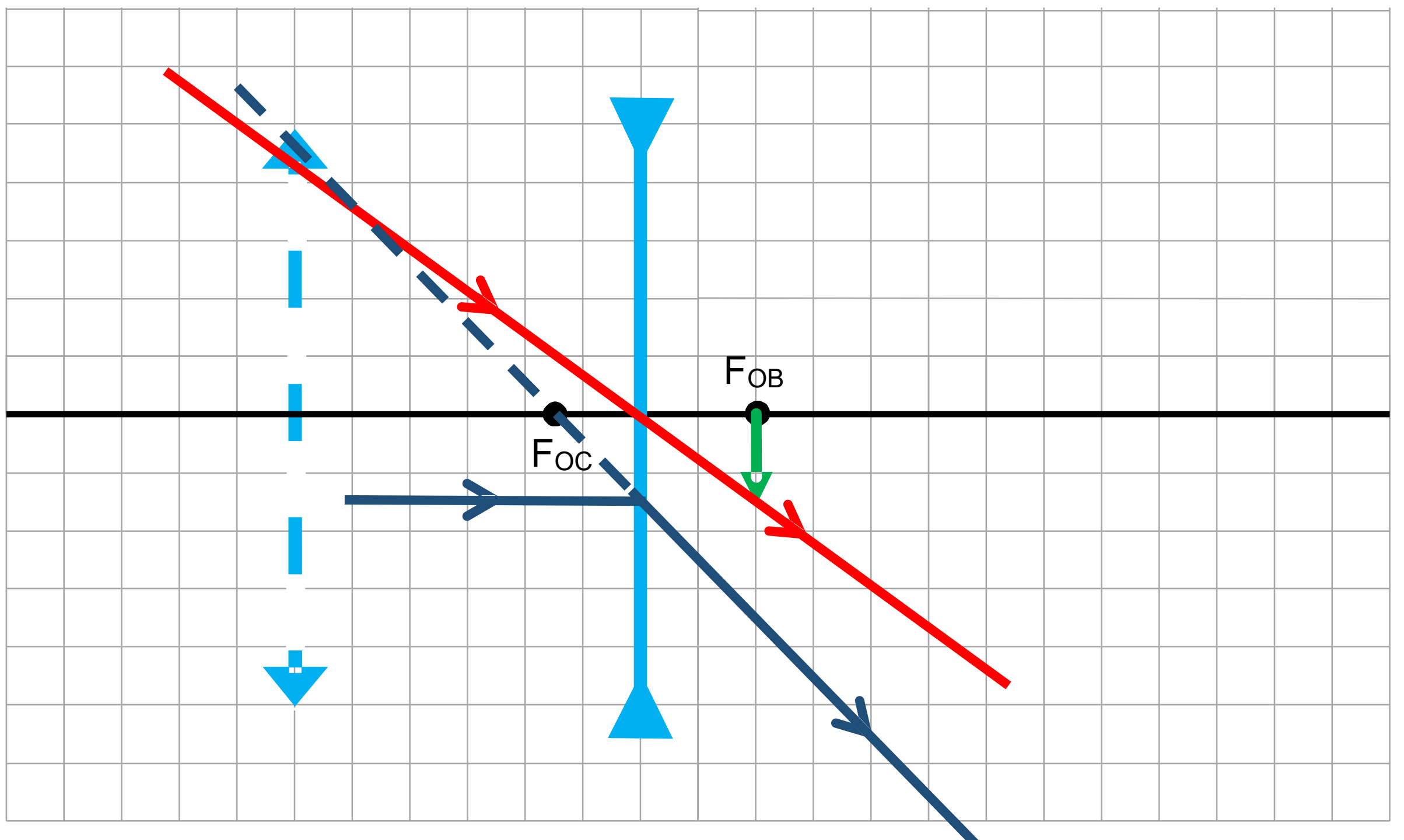


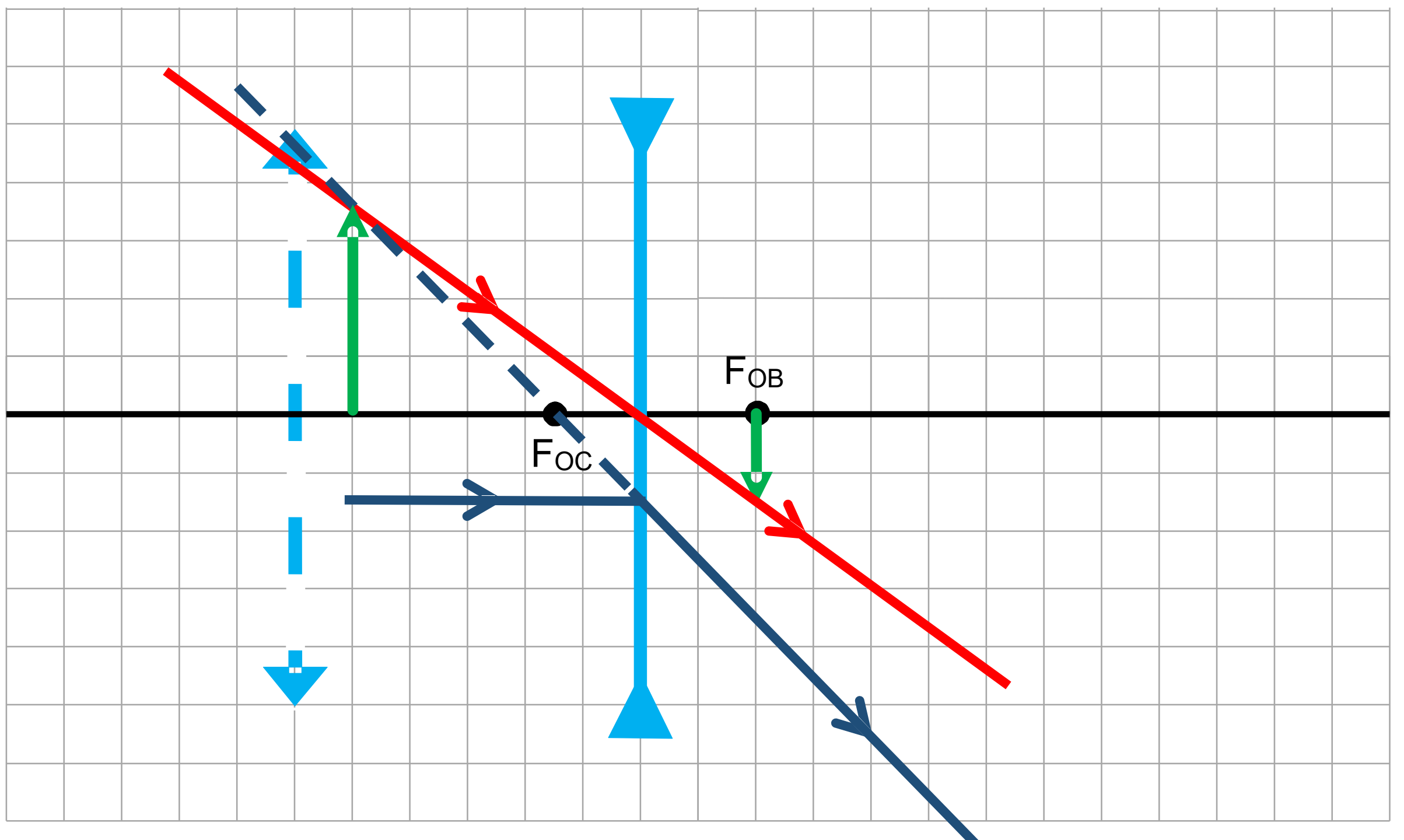


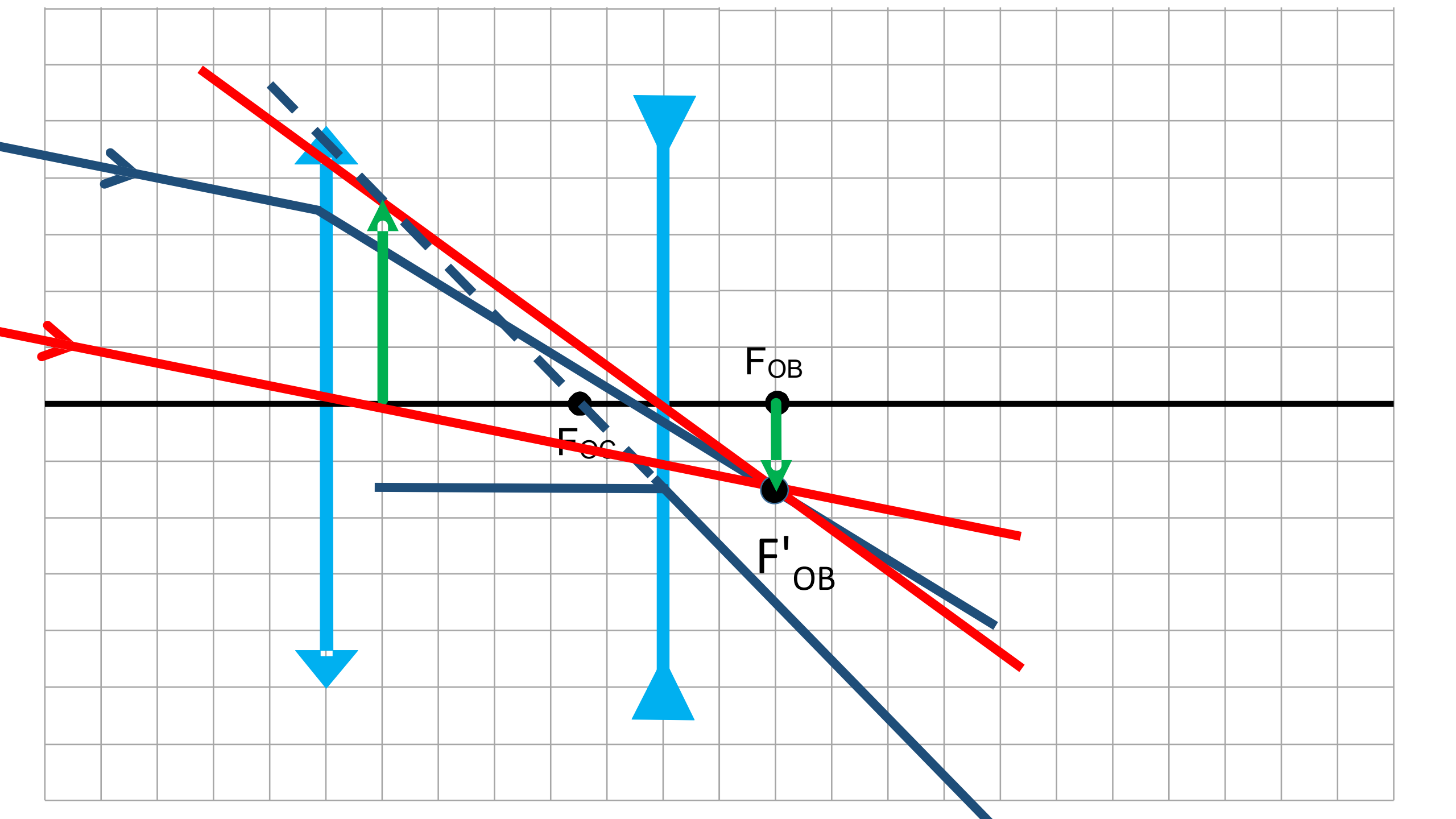












LUNETTA TERRESTRE

LUNETAS TERRESTRES

- IMAGEM:

LUNETAS TERRESTRES

- IMAGEM:
 - VIRTUAL

LUNETAS TERRESTRES

- IMAGEM:
 - VIRTUAL
 - DIREITA

LUNETAS TERRESTRES

- IMAGEM:
 - VIRTUAL
 - DIREITA
 - MAIOR

LUNETAS TERRESTRES

- IMAGEM:
 - VIRTUAL
 - DIREITA
 - MAIOR ???

LUNETAS TERRESTRES

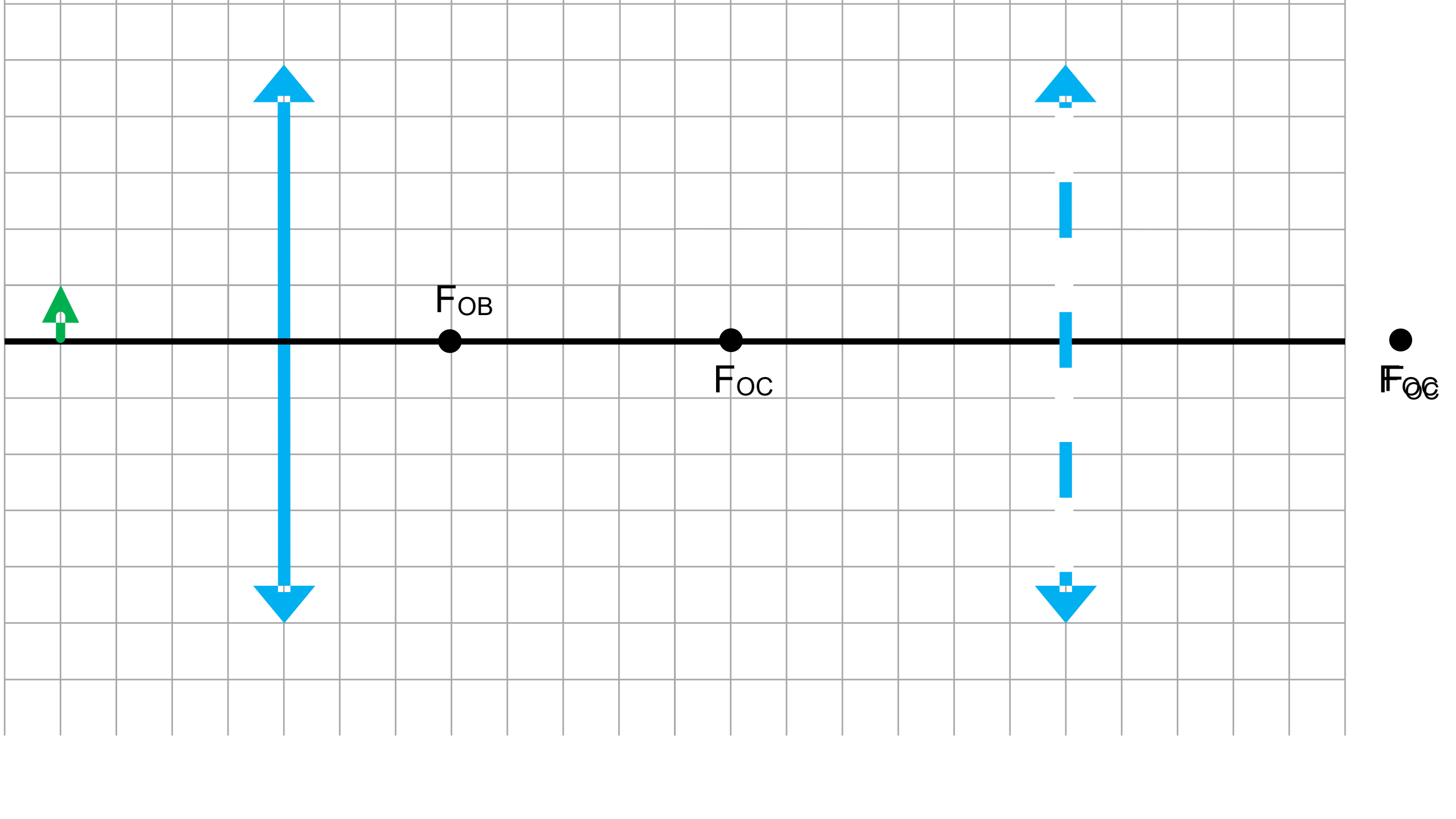
- IMAGEM:
 - VIRTUAL
 - DIREITA
 - MAIOR ???
 - Maior aumento angular!!!

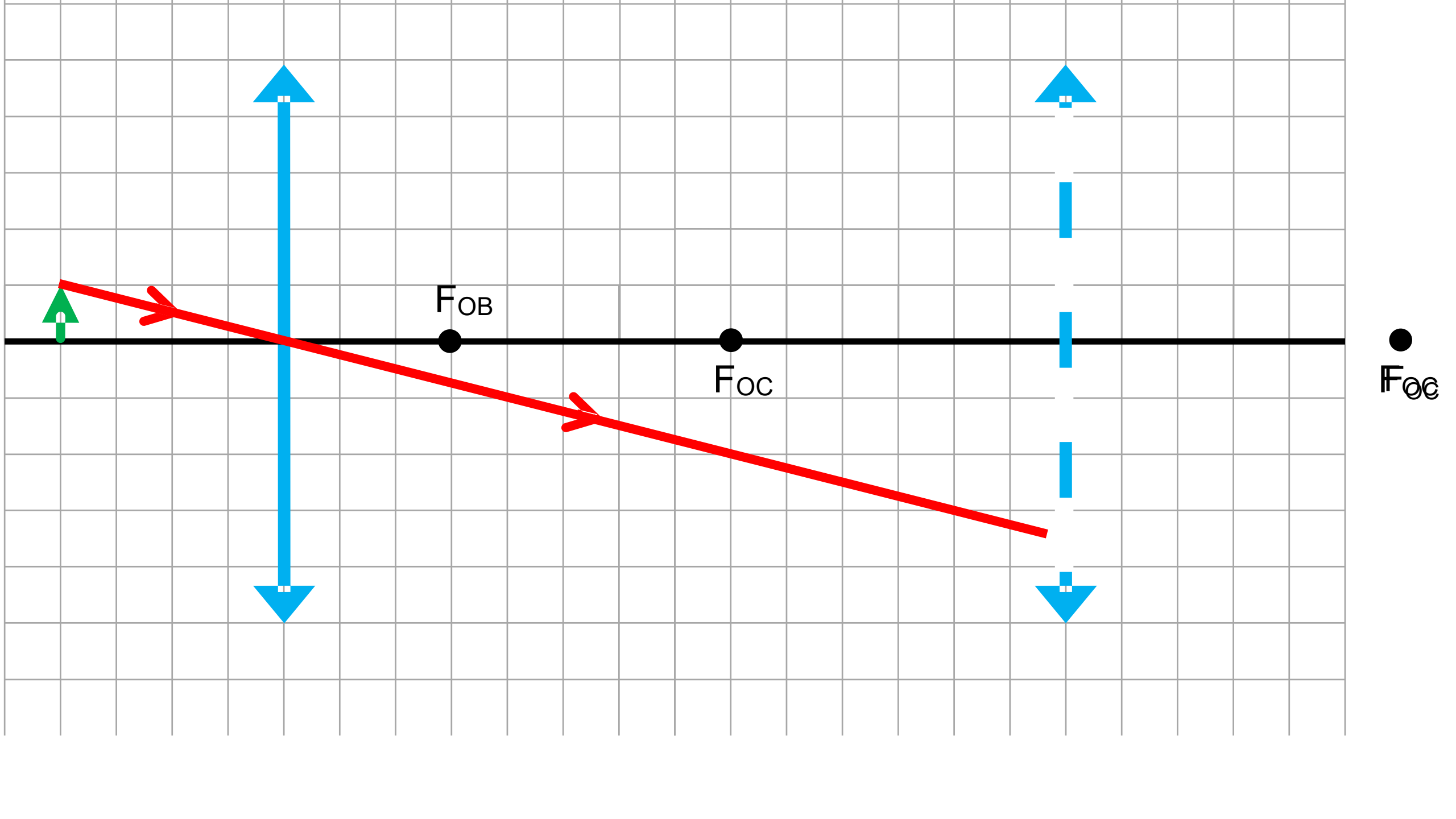
LUNETAS TERRESTRES

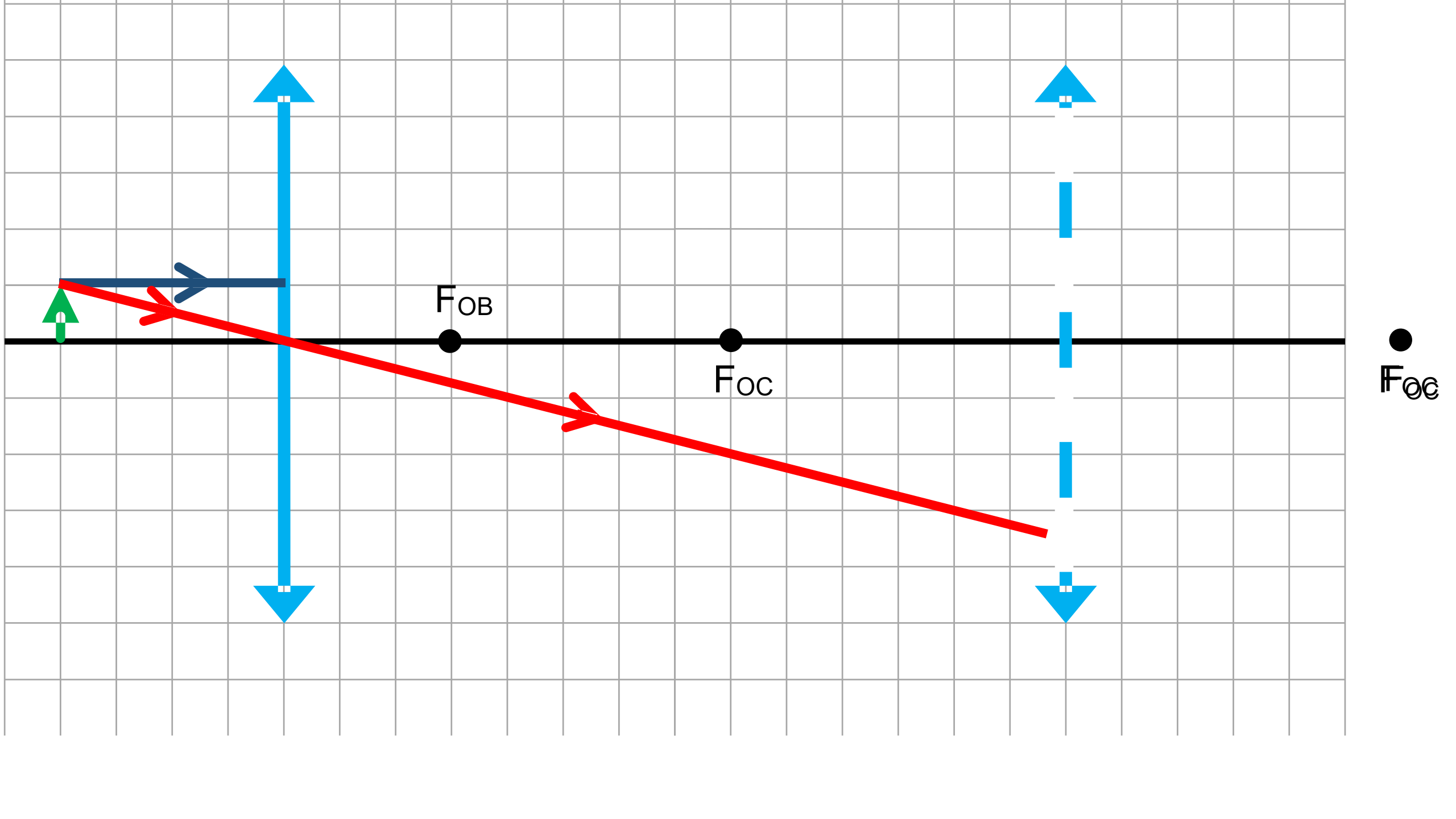
- IMAGEM:
 - VIRTUAL
 - DIREITA
 - MAIOR ???
 - Maior aumento angular!!!

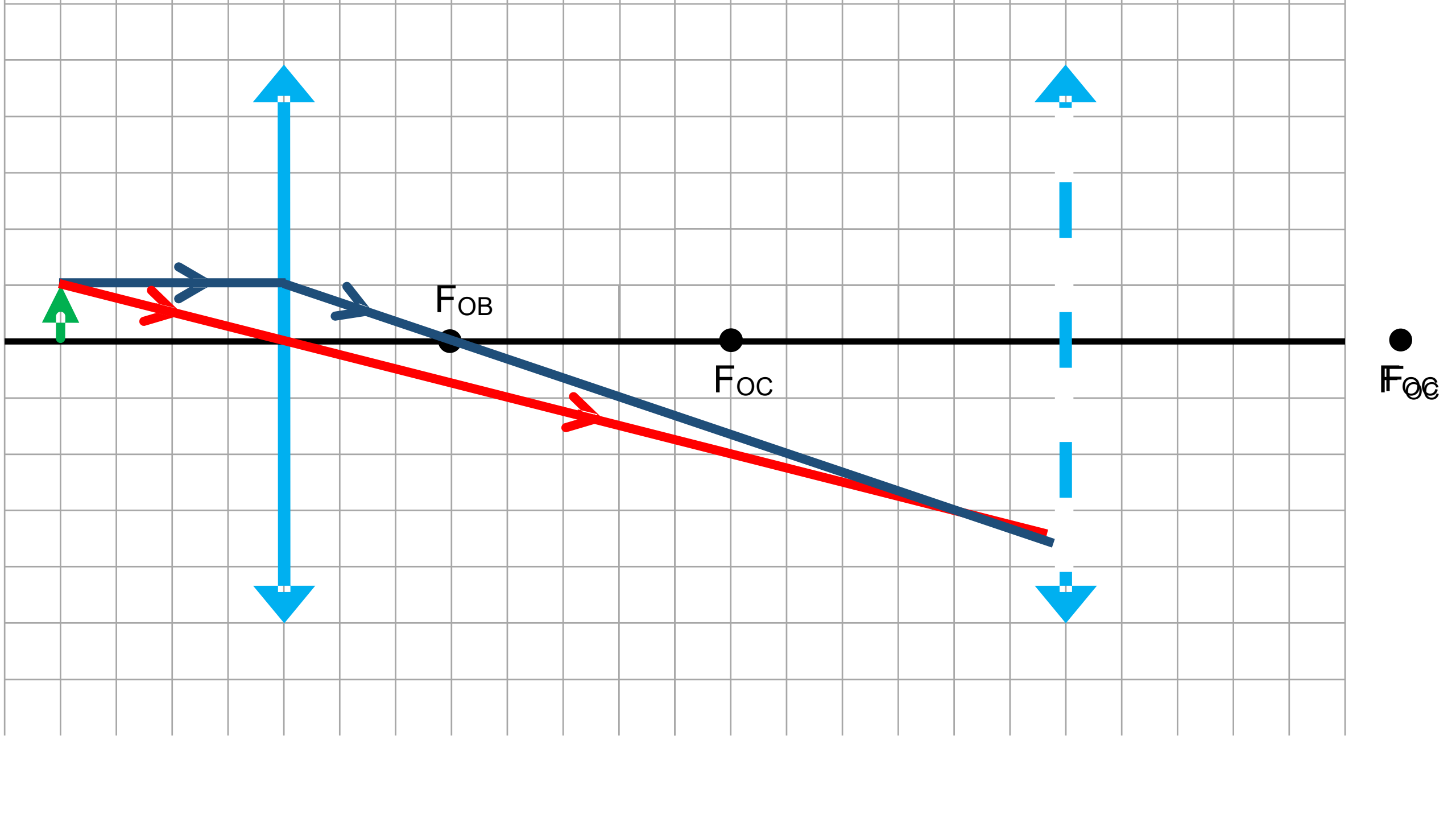


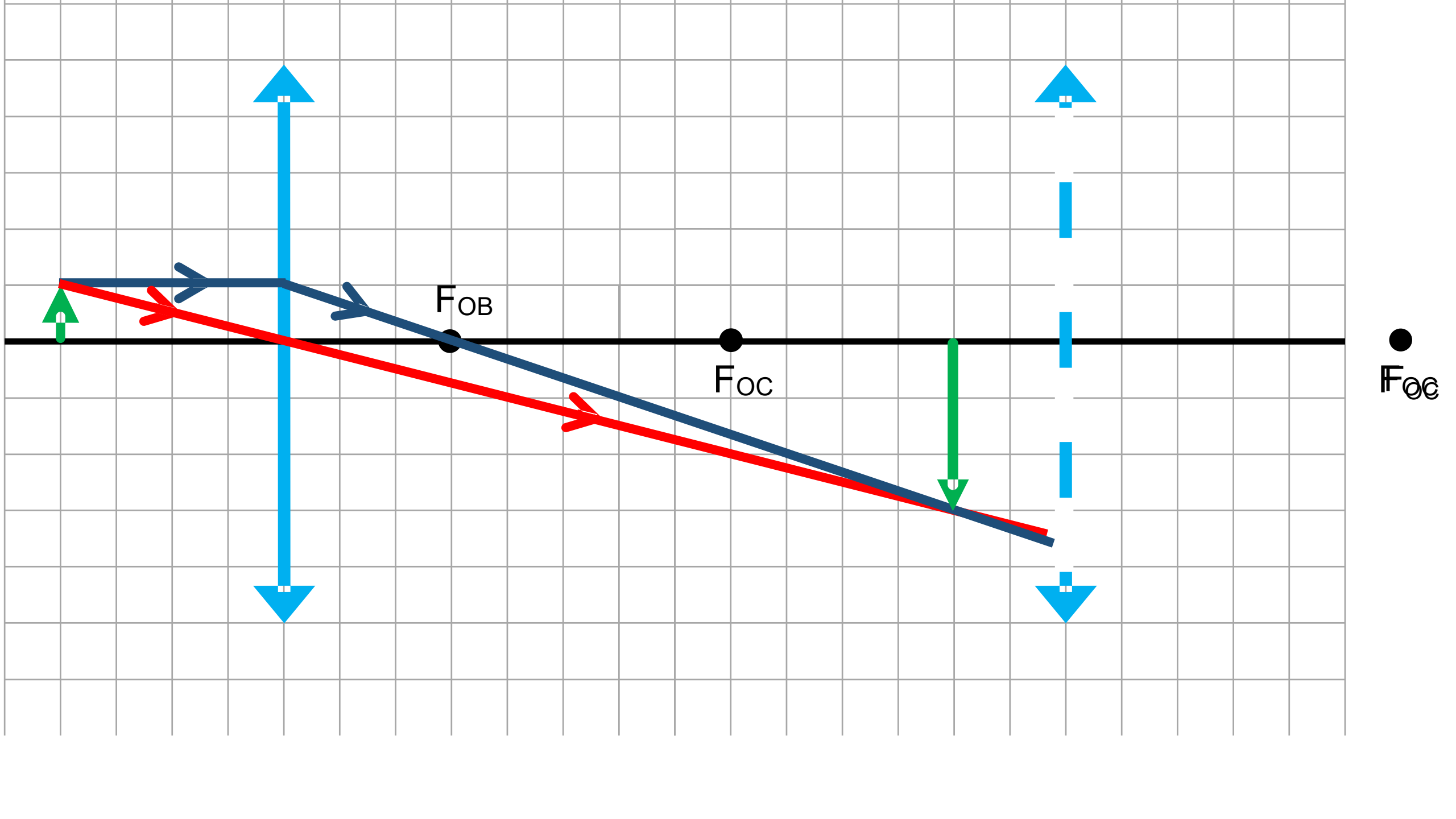
MICROSCÓPIO

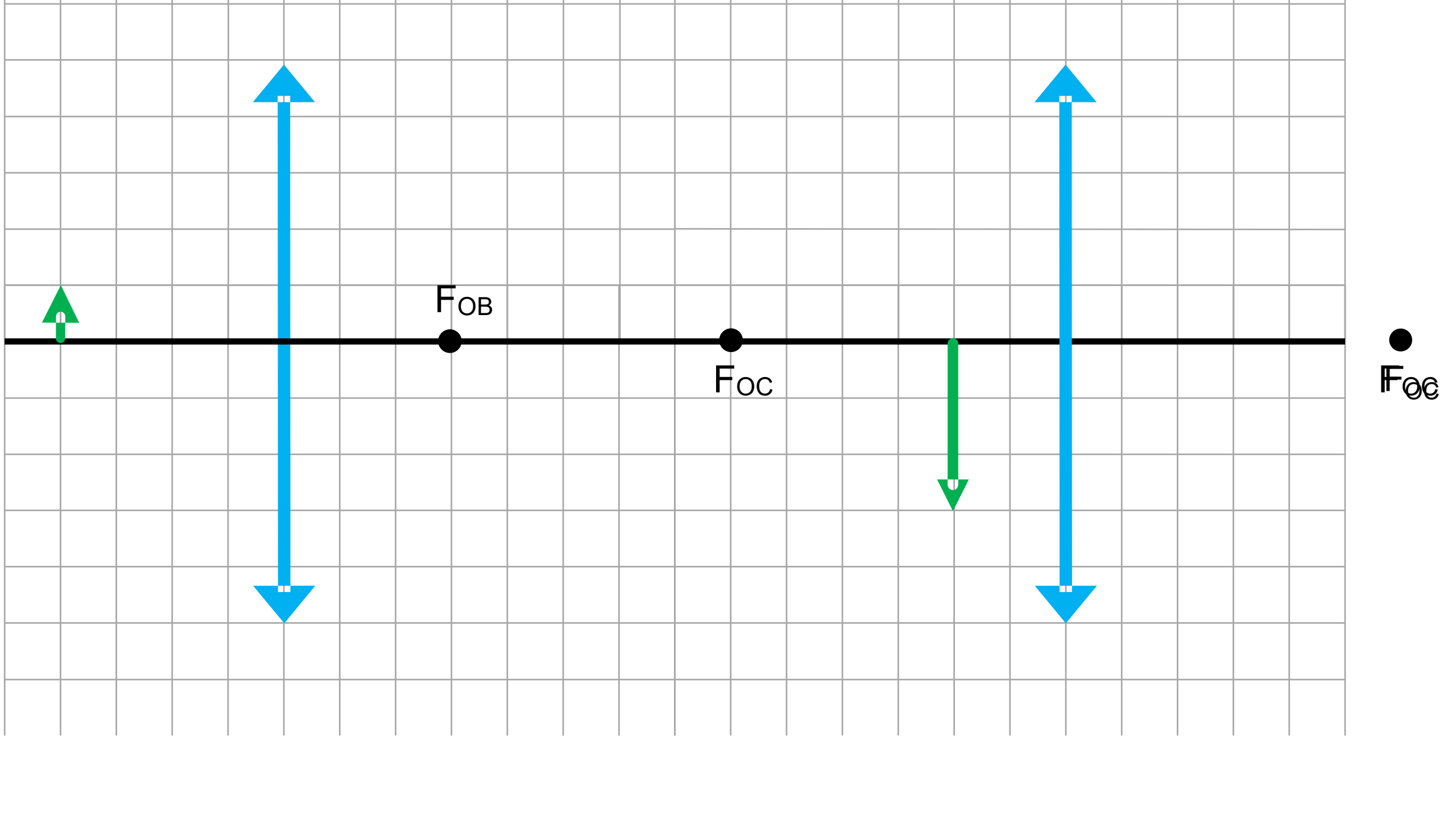


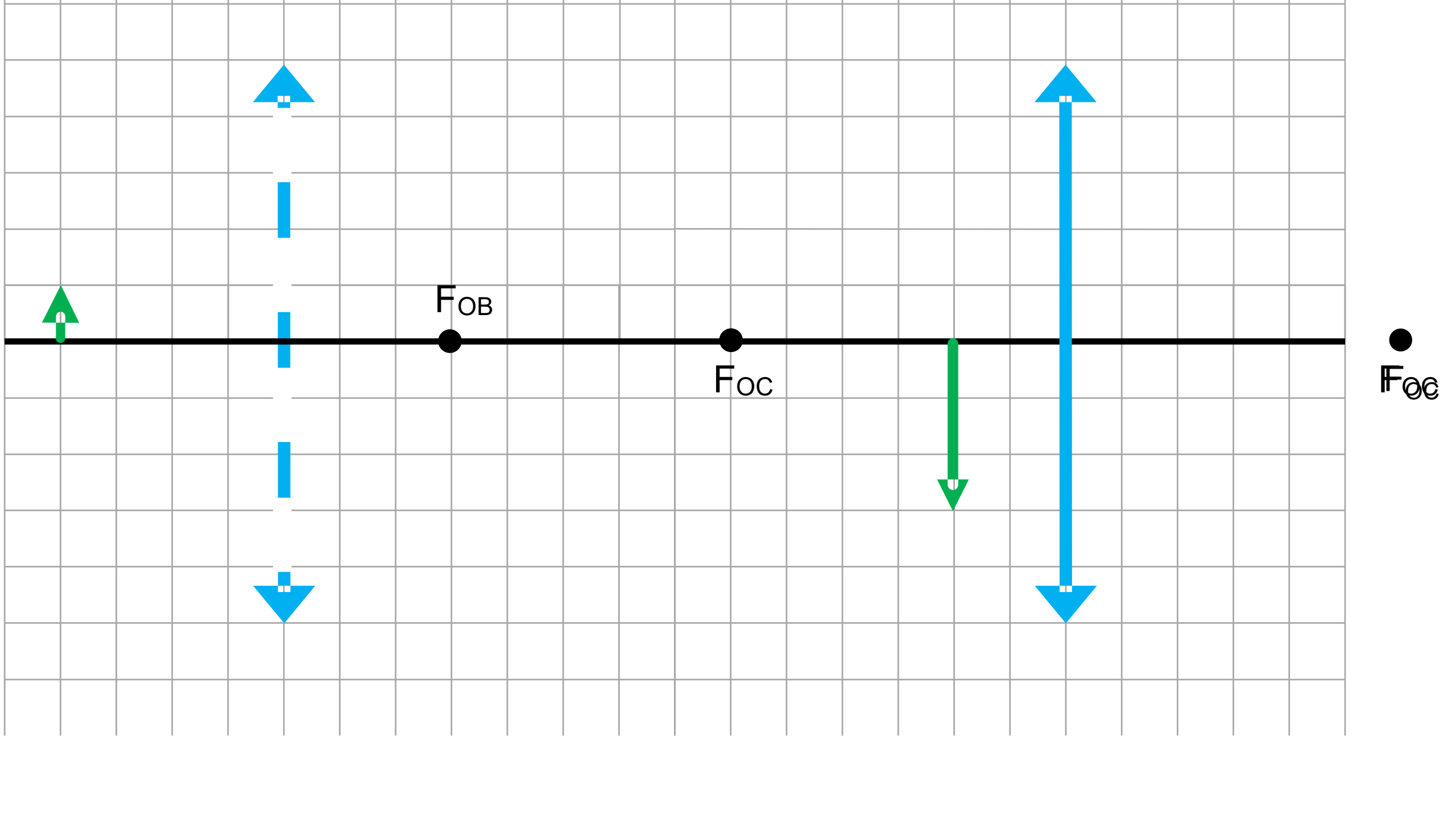


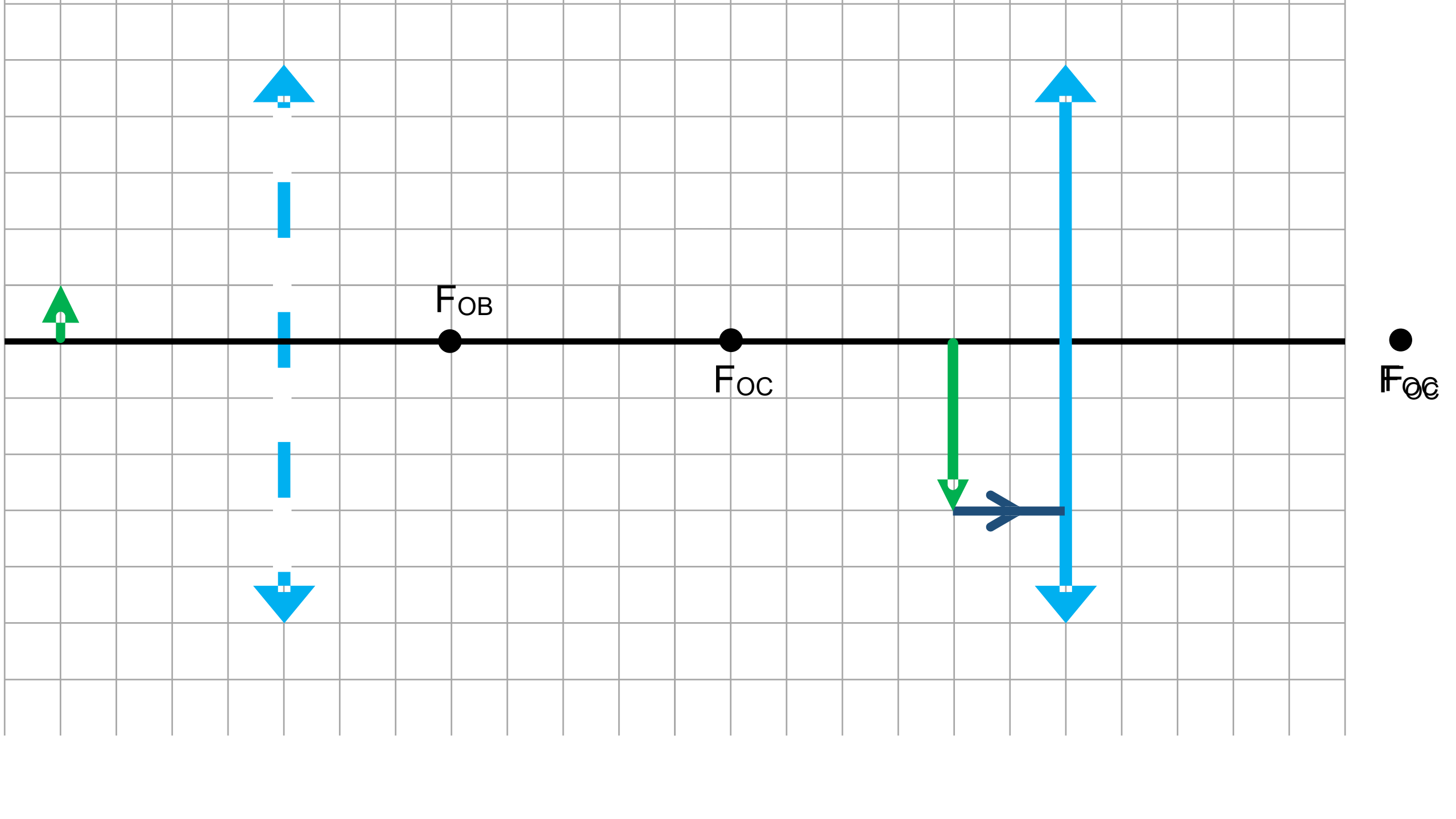


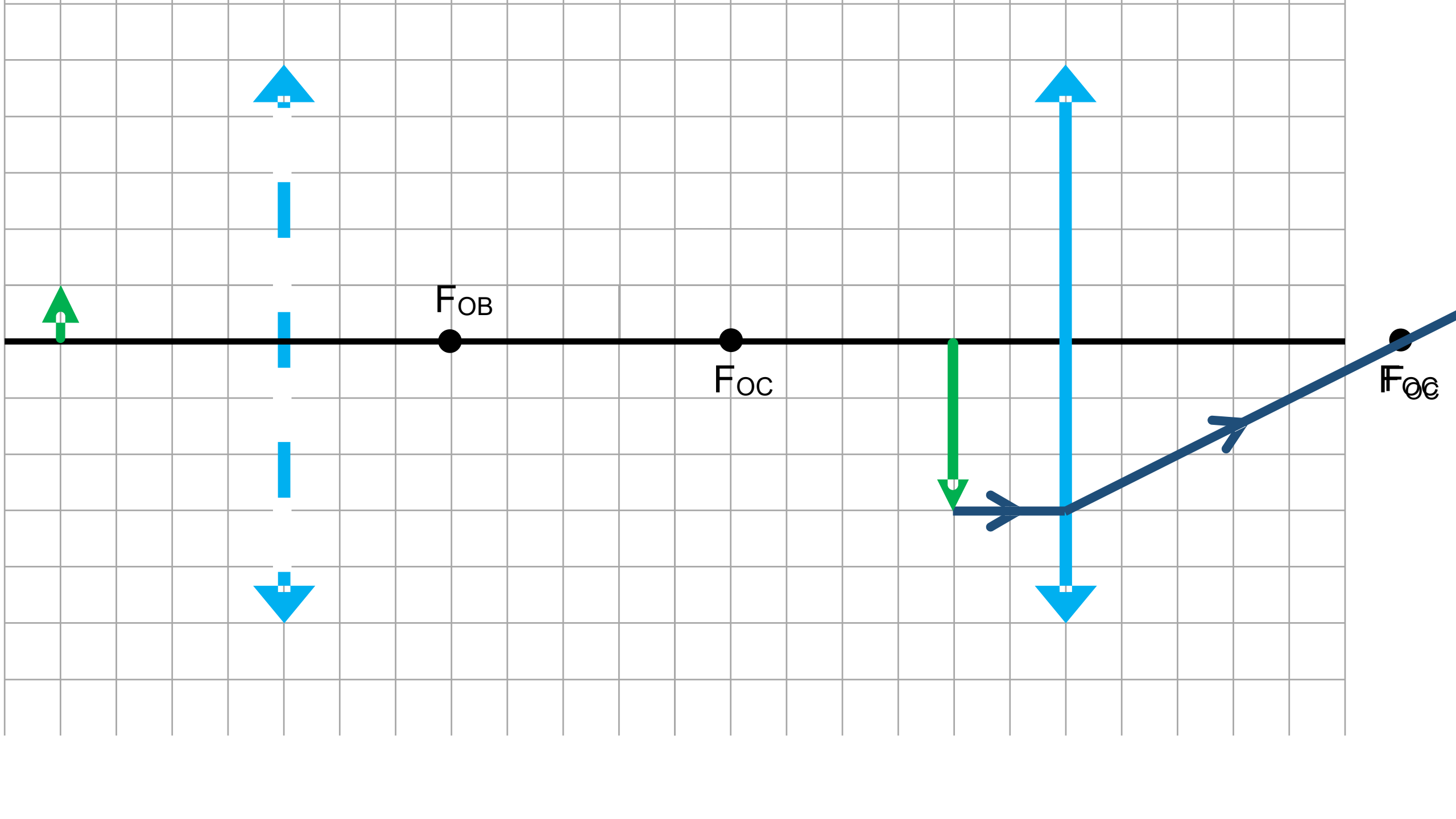


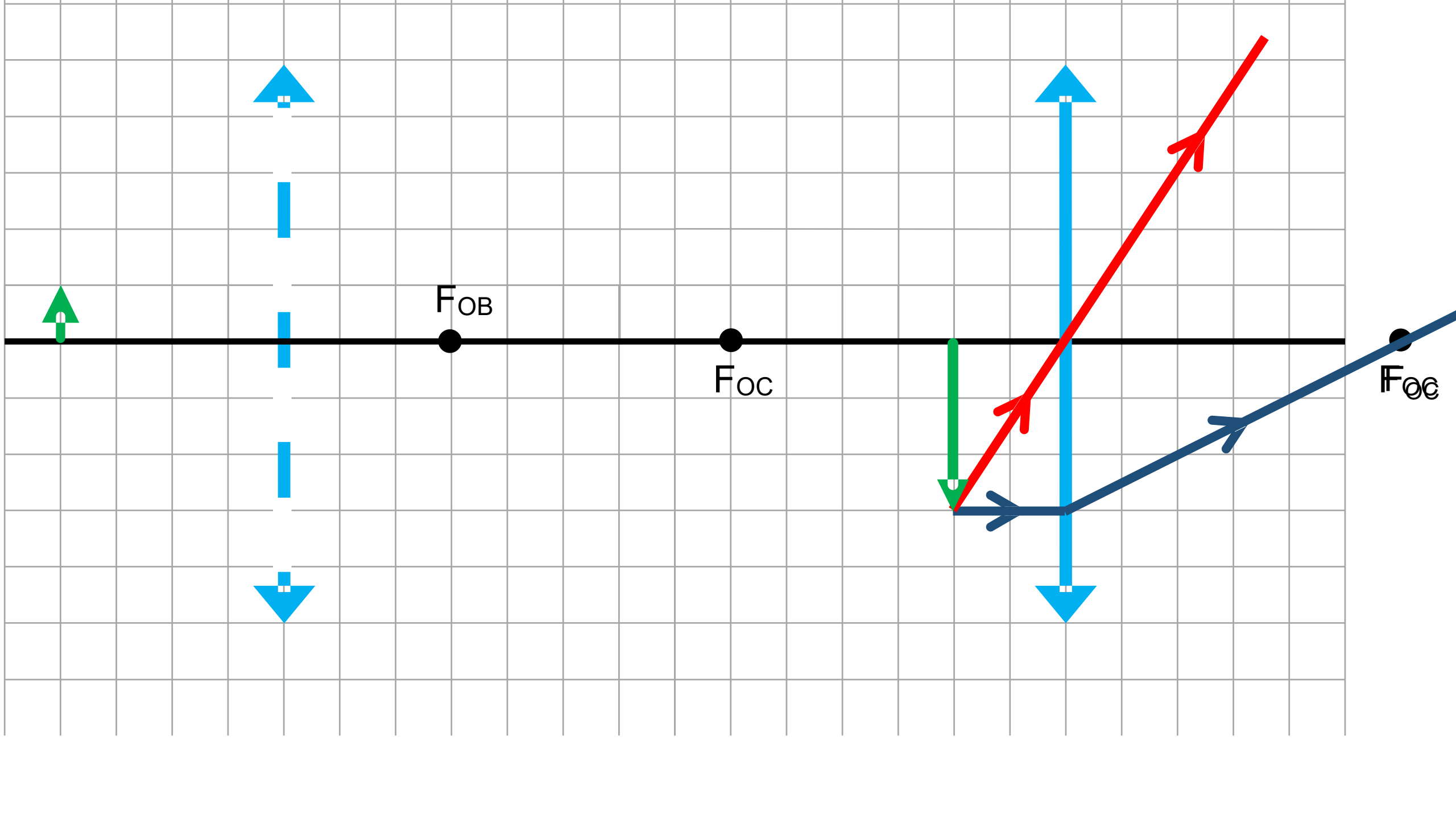


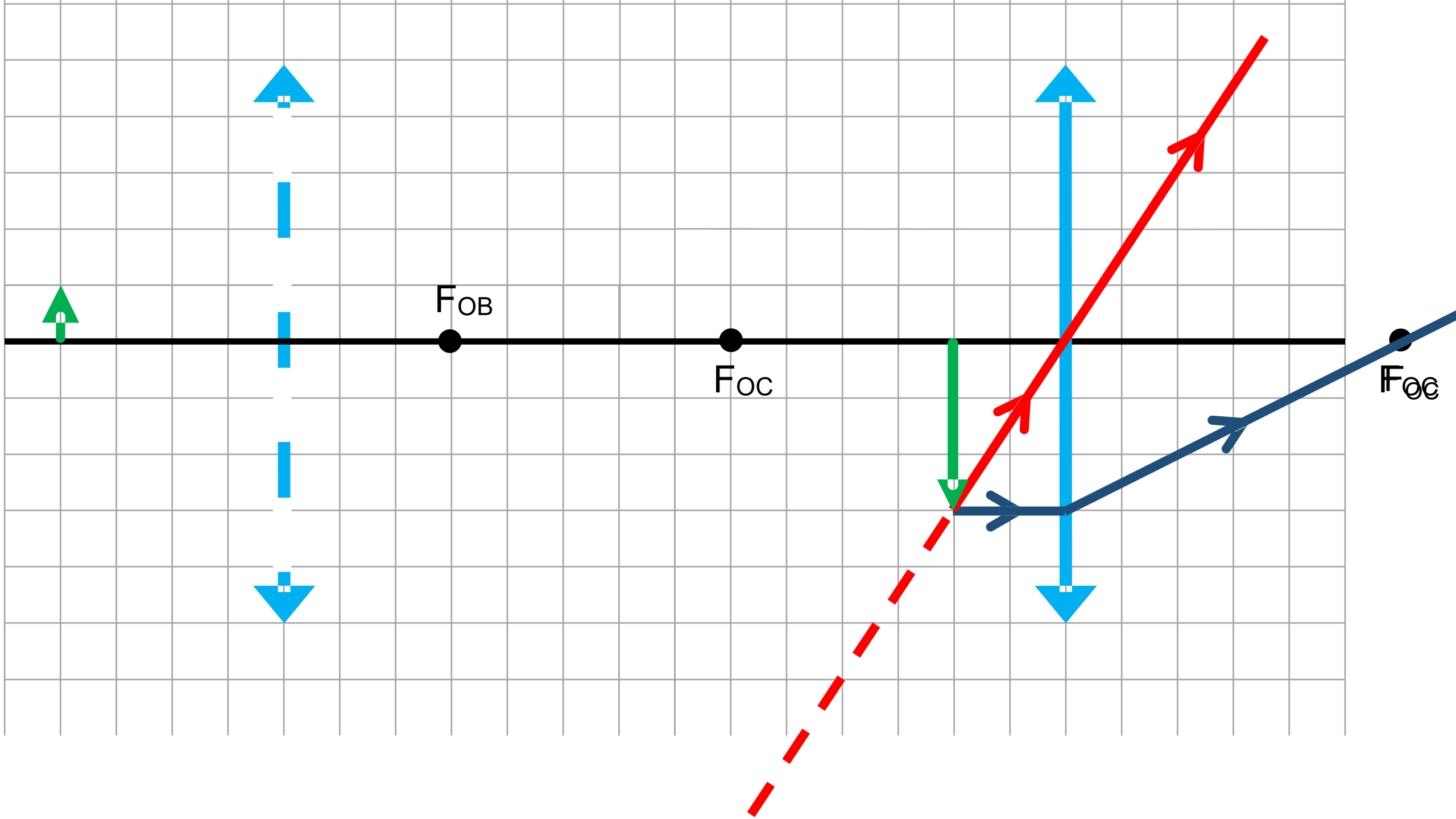


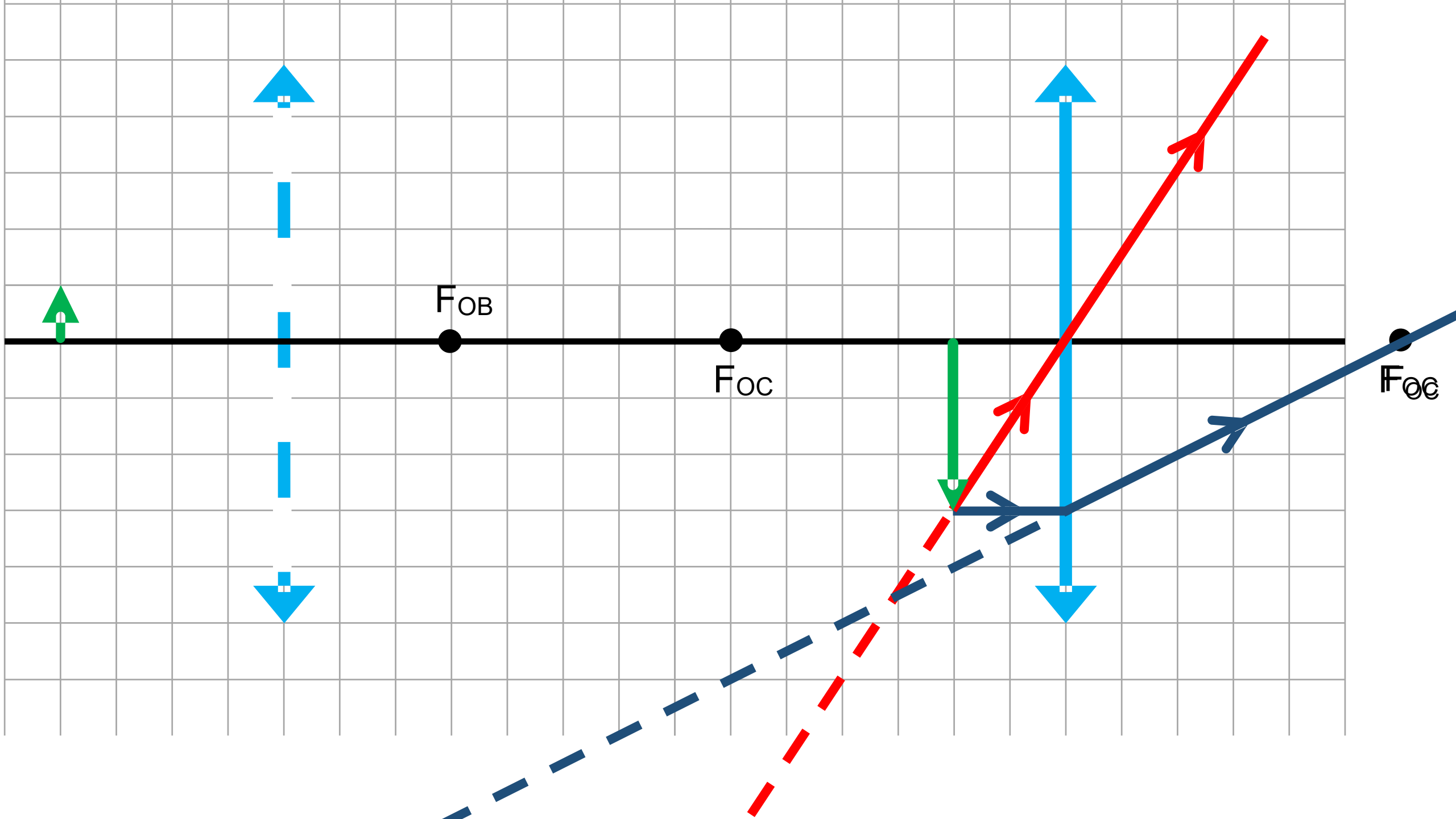


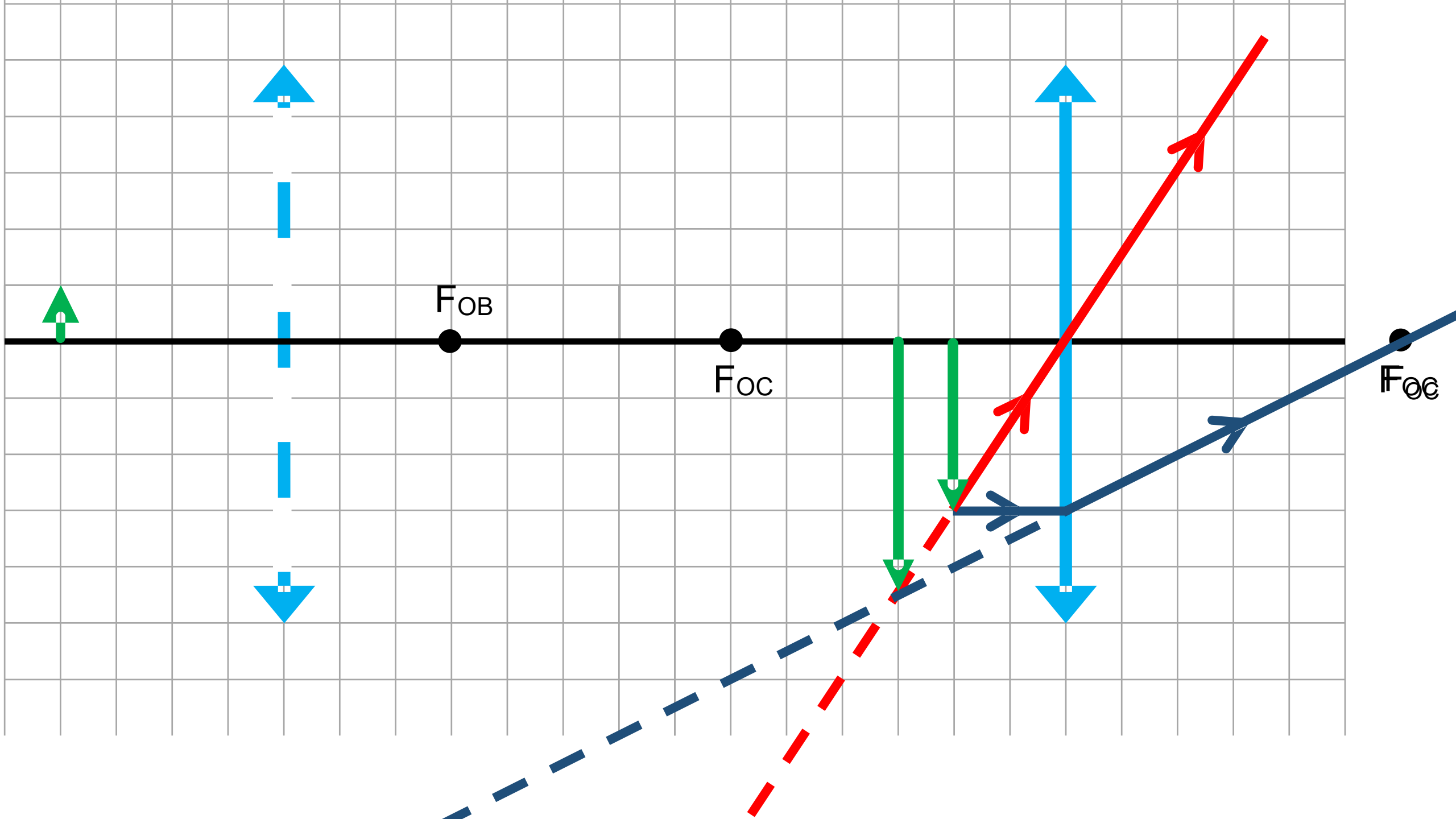


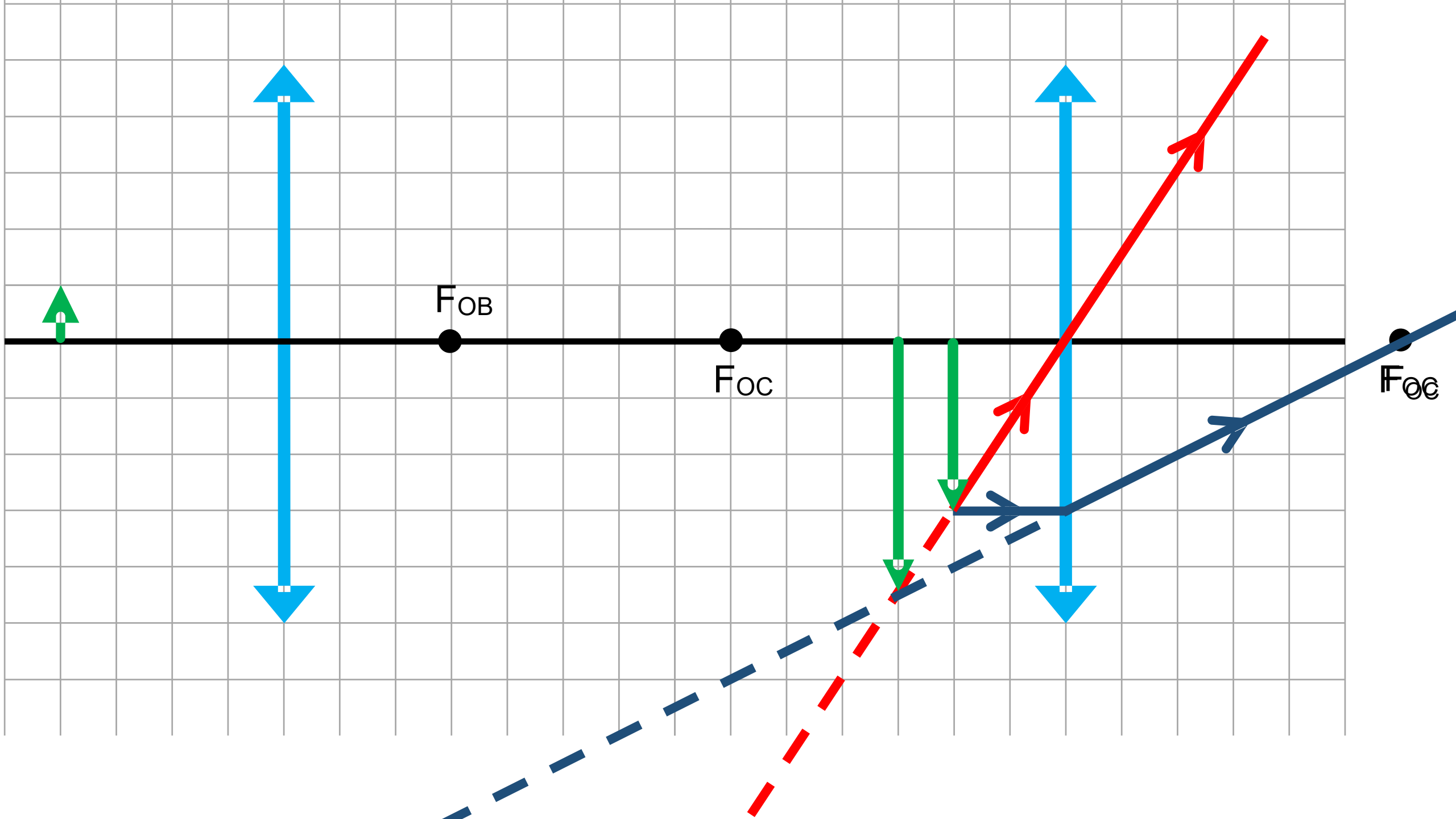


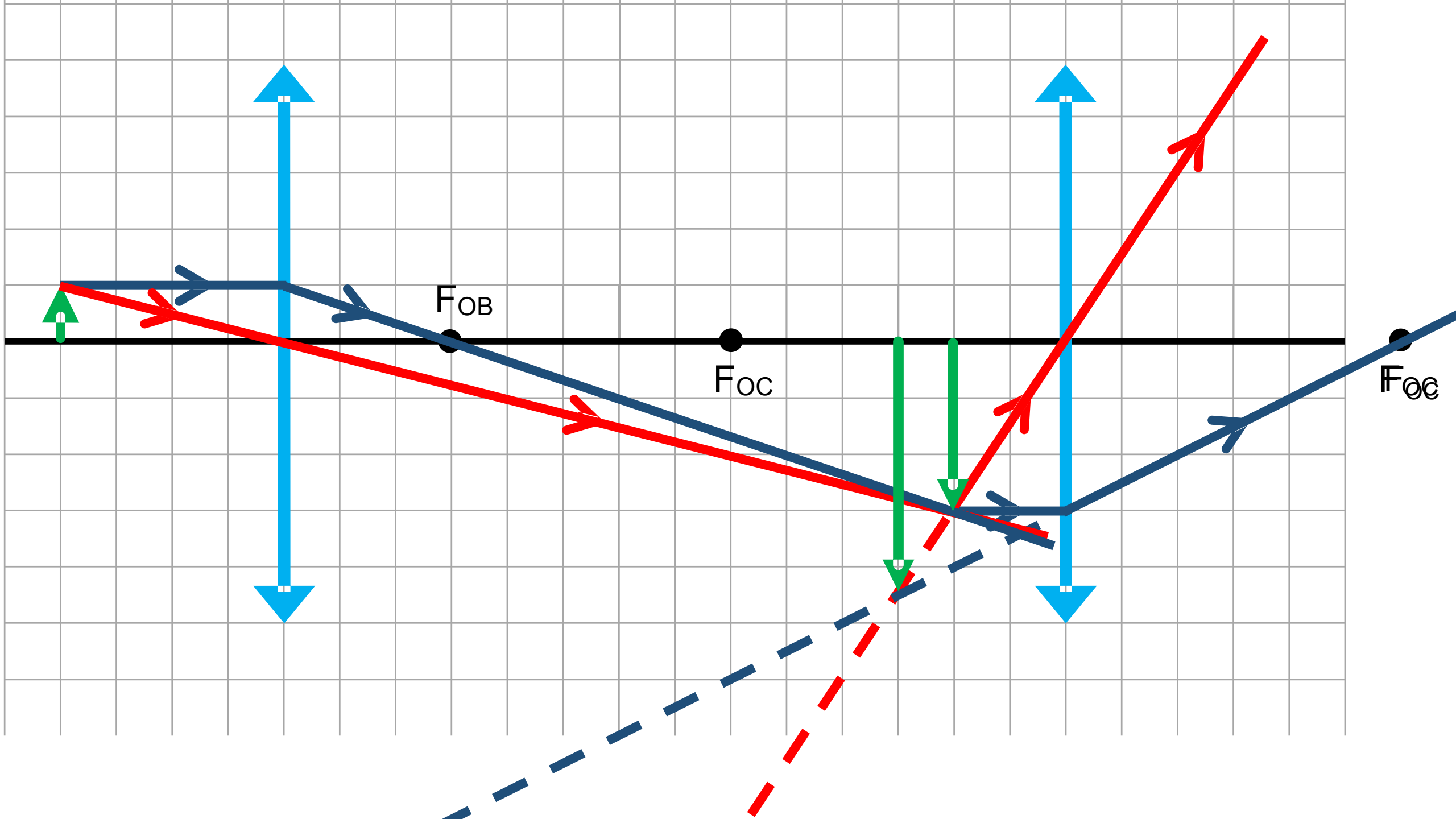












MICROSCÓPIO

MICROSCÓPIO

- IMAGEM:

MICROSCÓPIO

- IMAGEM:
 - VIRTUAL

MICROSCÓPIO

- IMAGEM:
 - VIRTUAL
 - INVERTIDA

MICROSCÓPIO

- IMAGEM:
 - VIRTUAL
 - INVERTIDA
 - MAIOR

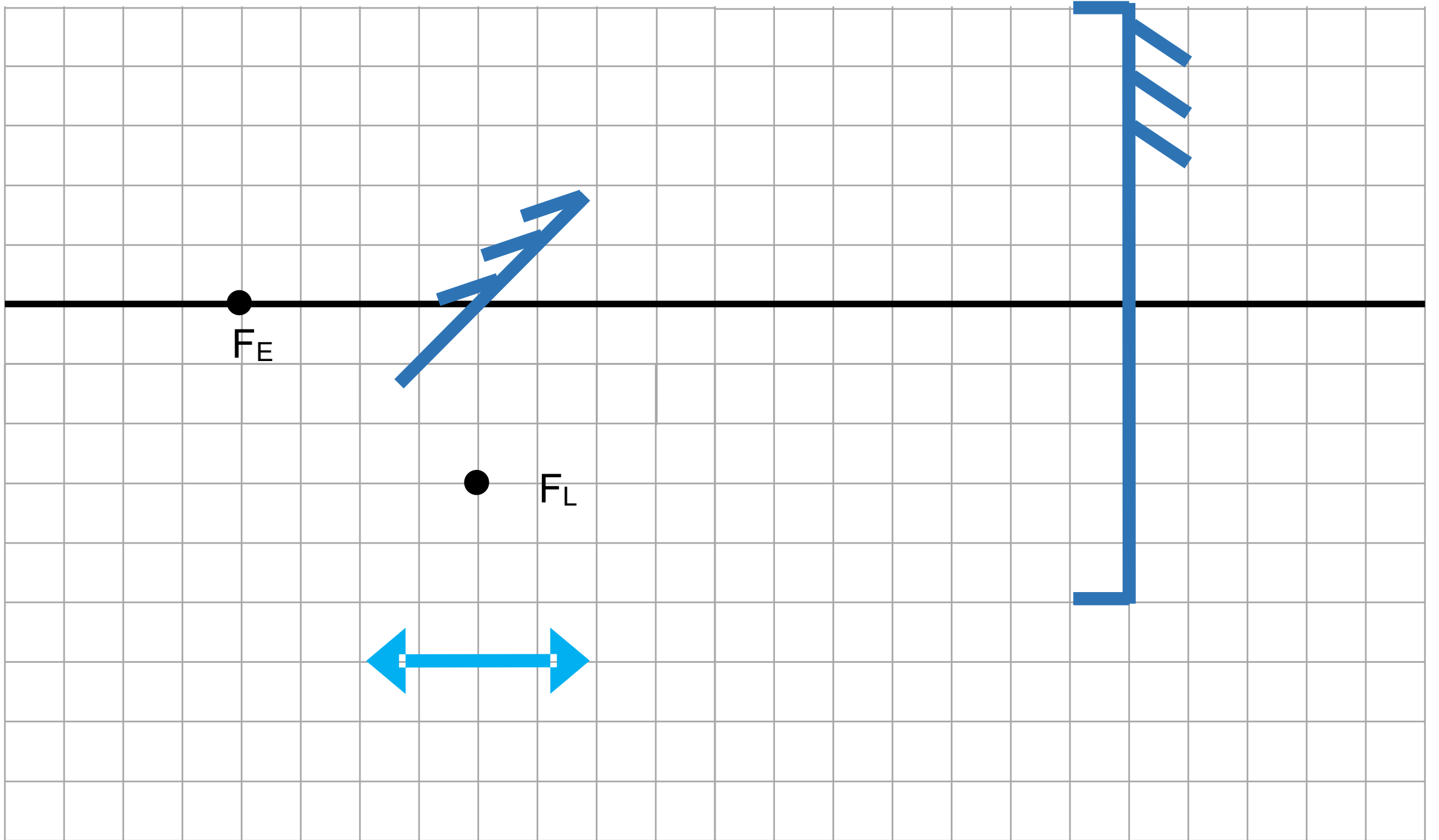
MICROSCÓPIO

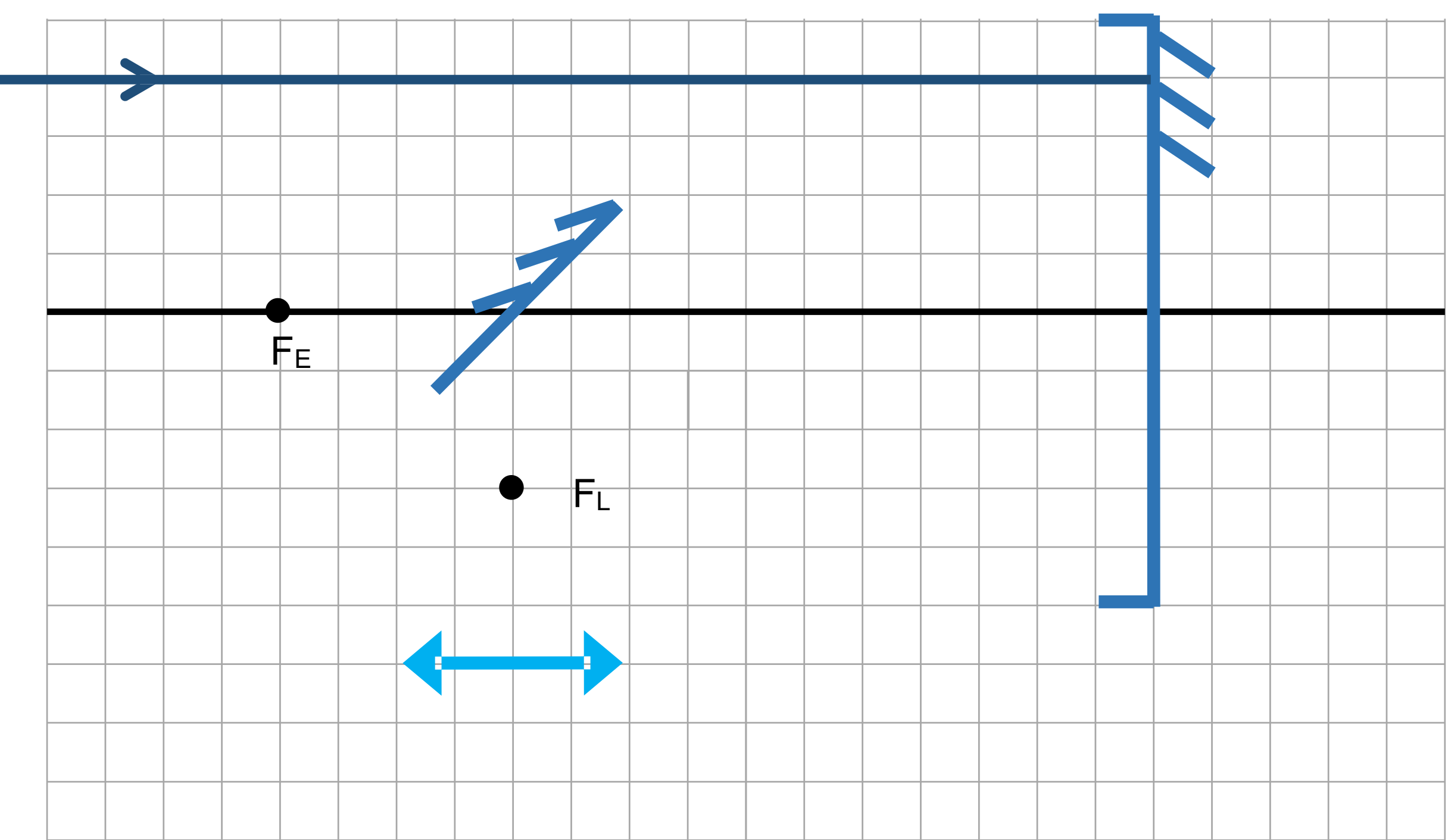
- IMAGEM:
 - VIRTUAL
 - INVERTIDA
 - MAIOR
 - AUMENTO:

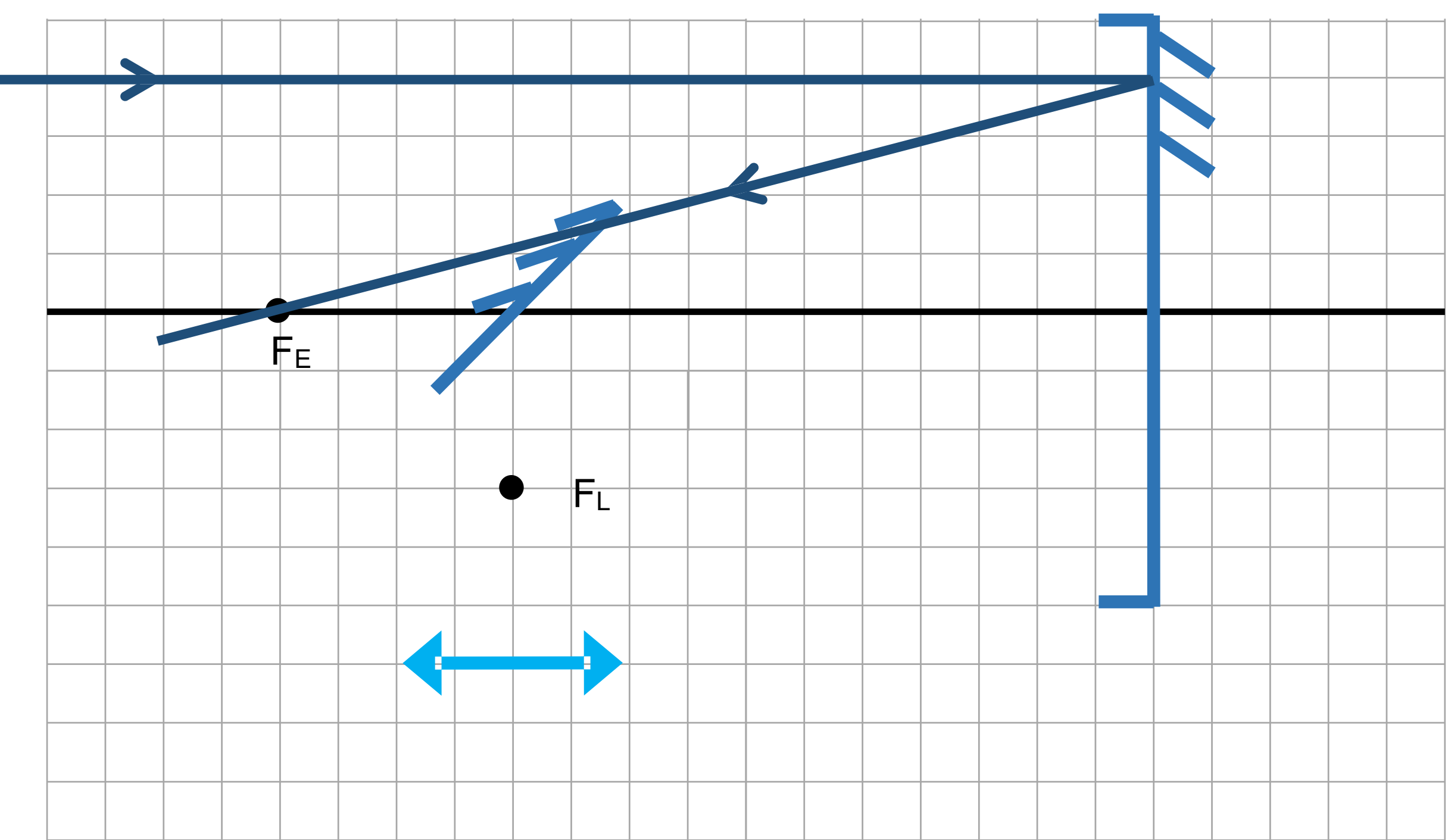
MICROSCÓPIO

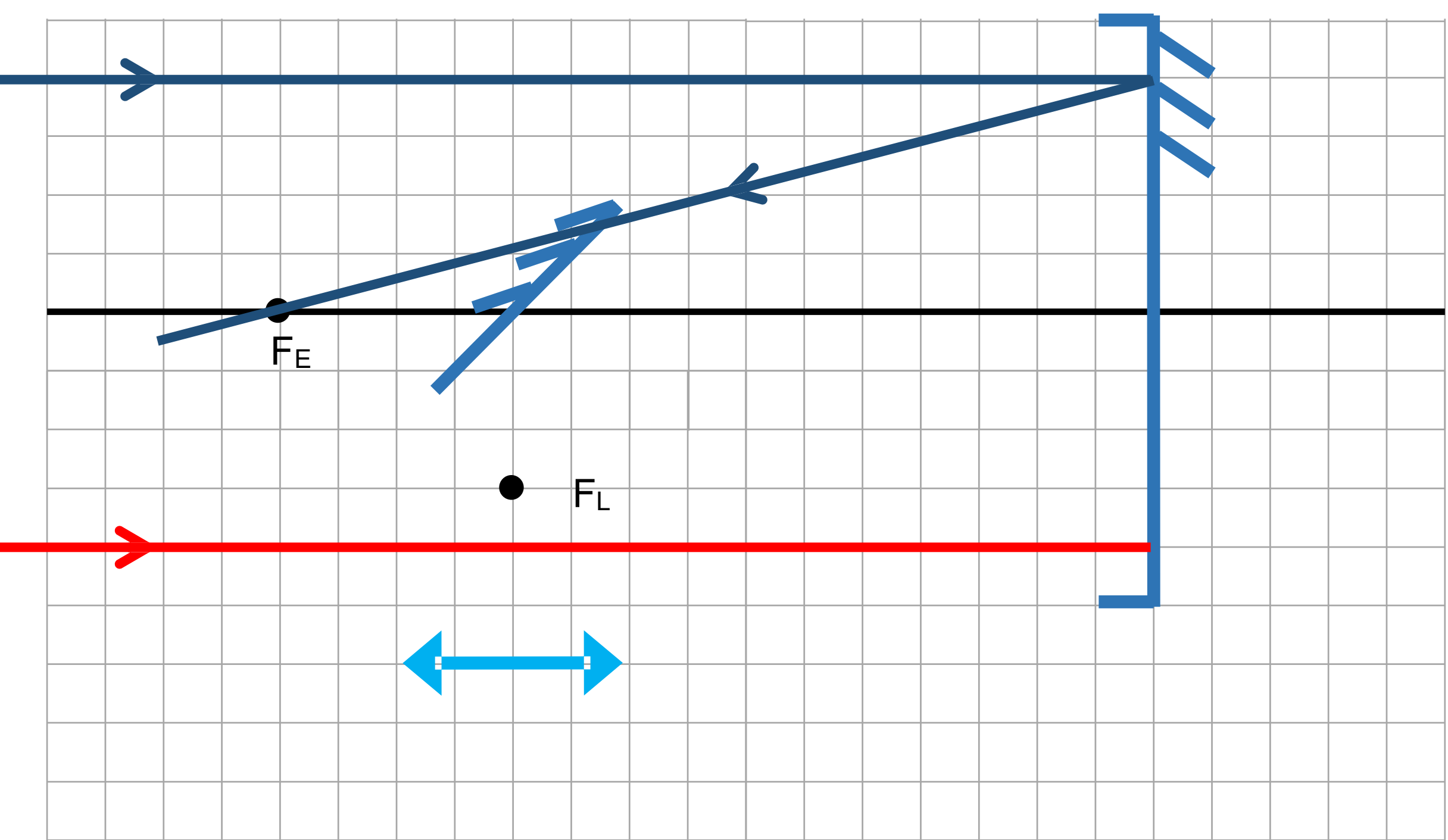
- IMAGEM:
 - VIRTUAL
 - INVERTIDA
 - MAIOR
 - AUMENTO: $A = A_{OB} \cdot A_{OC}$

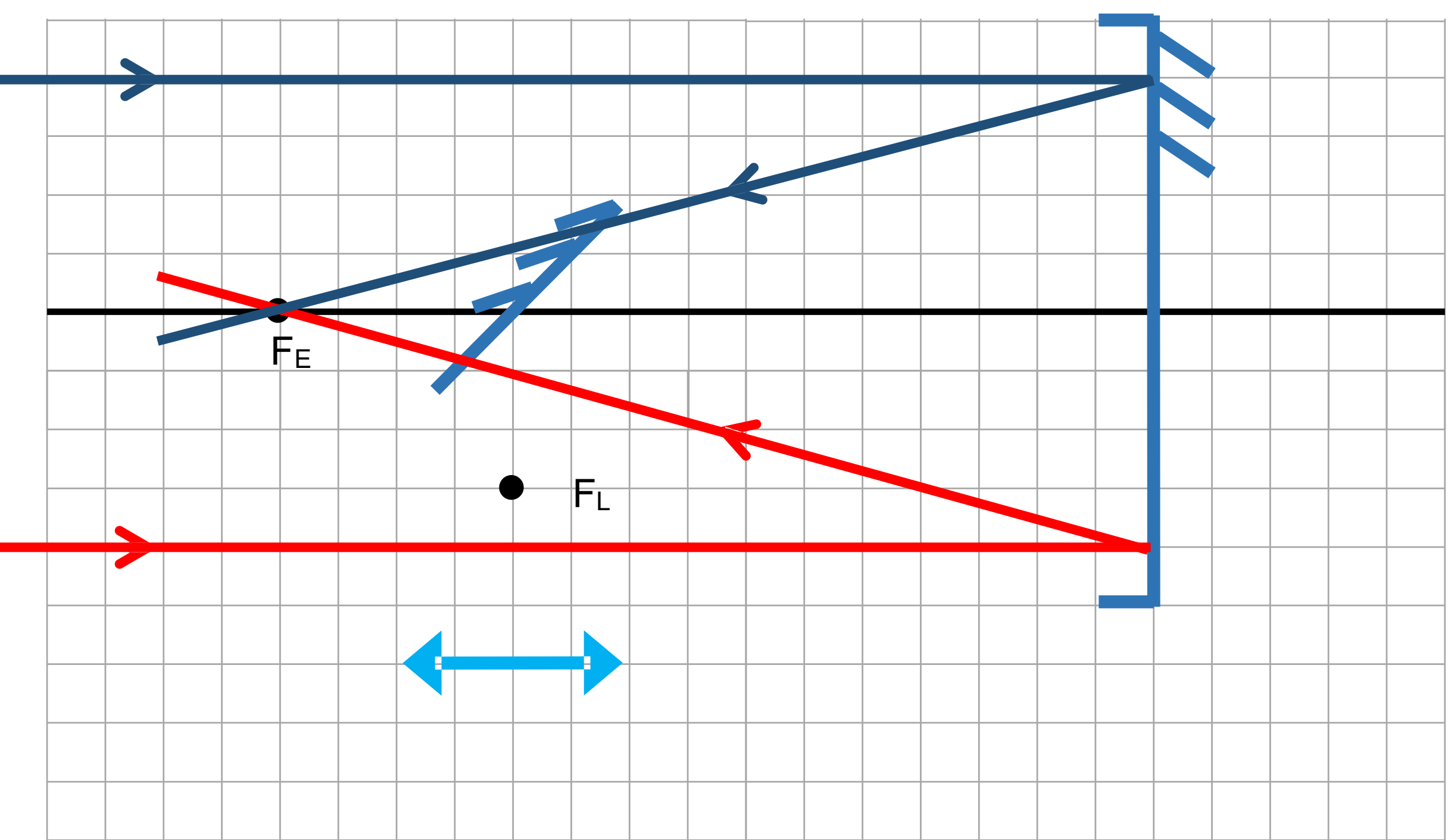
TELESCÓPIO NEWTONIANO

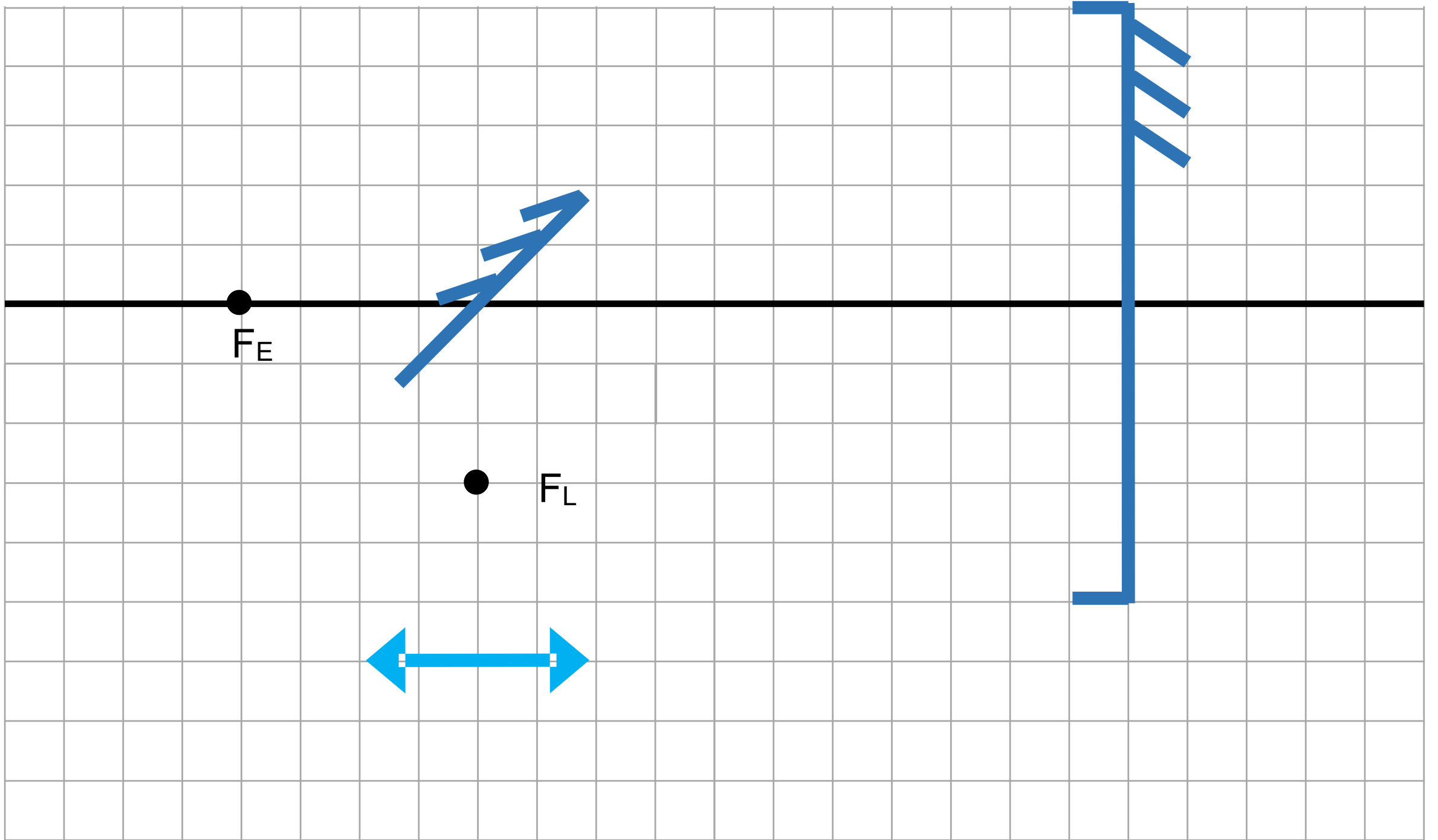


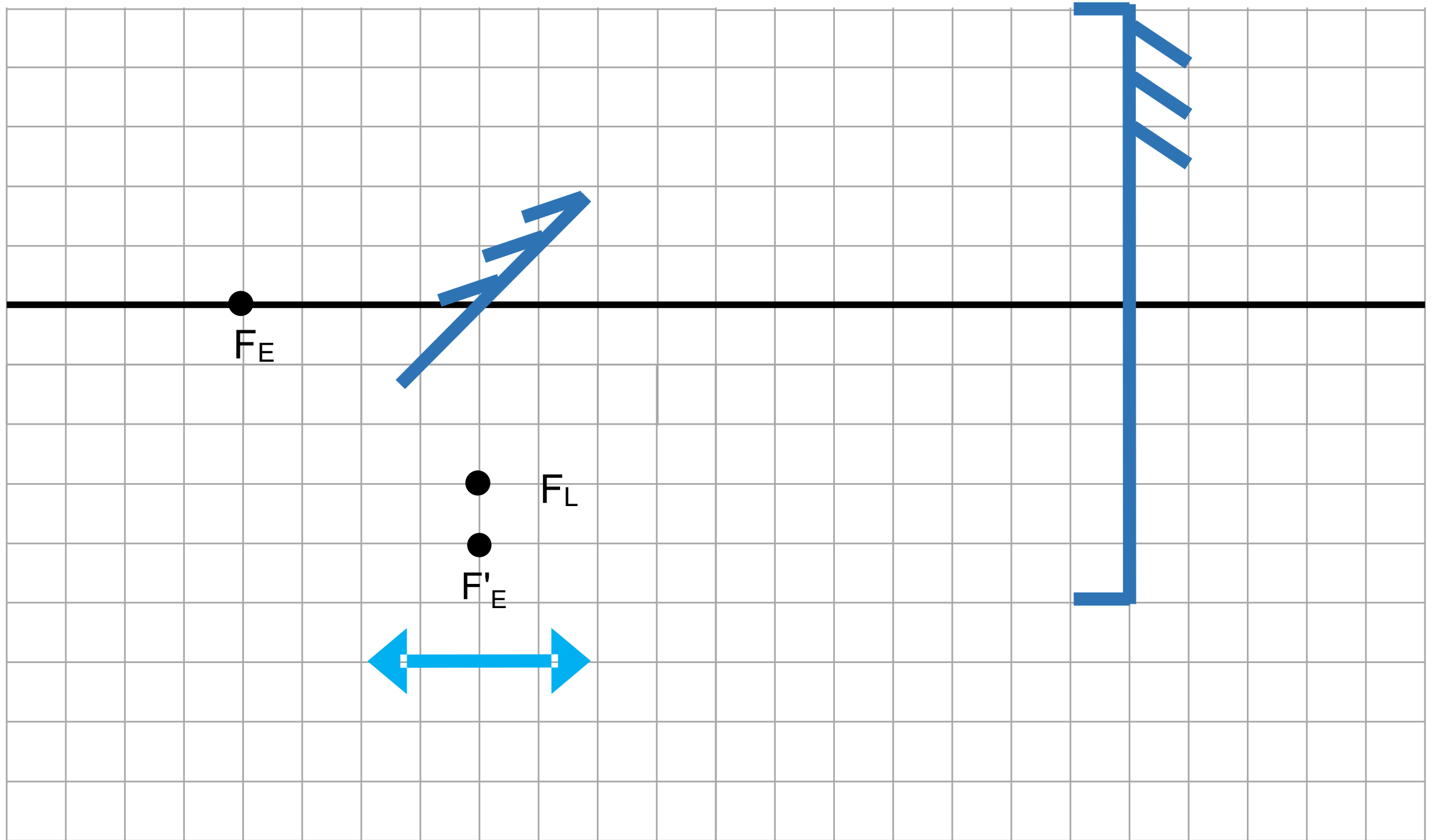


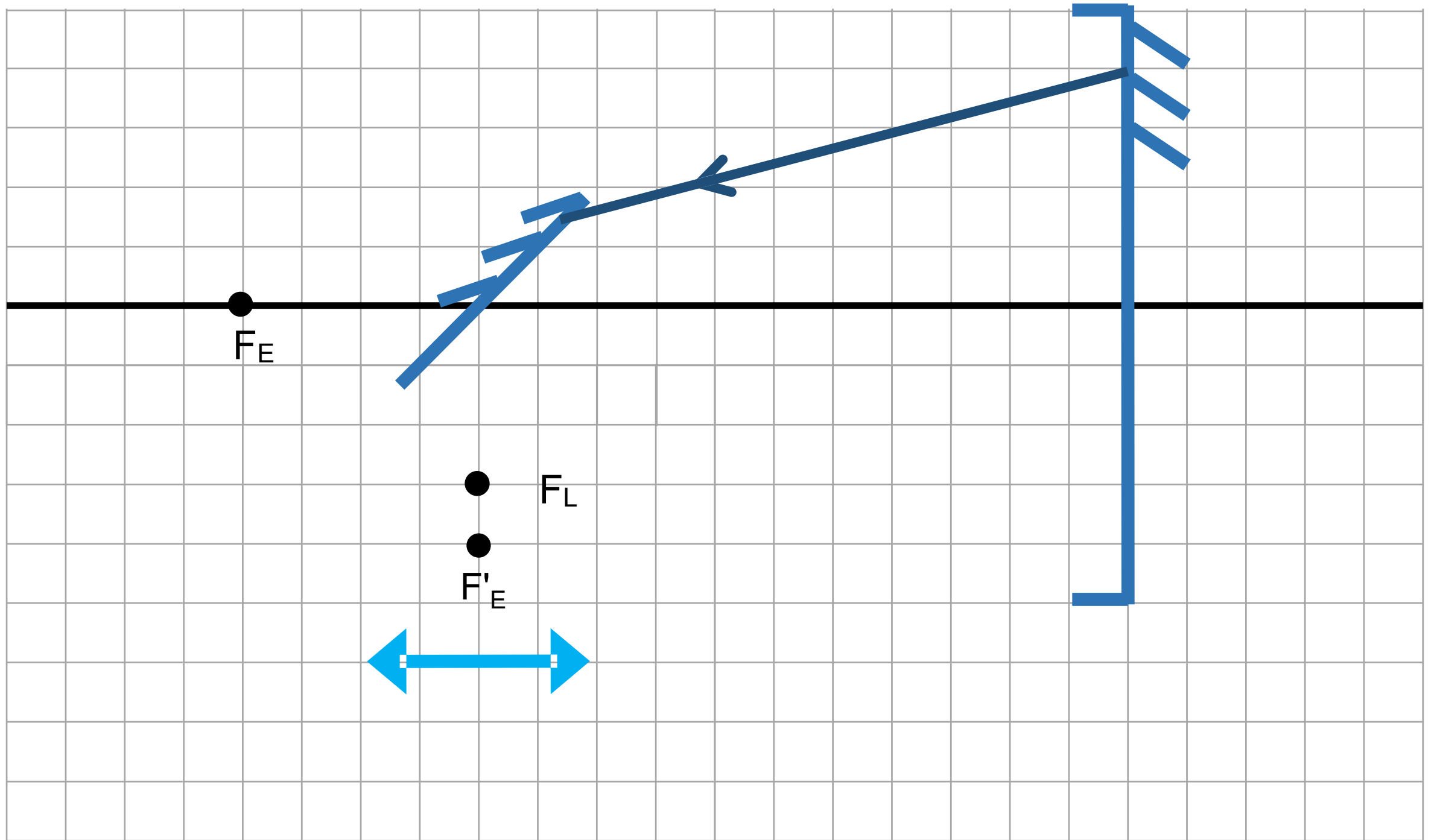


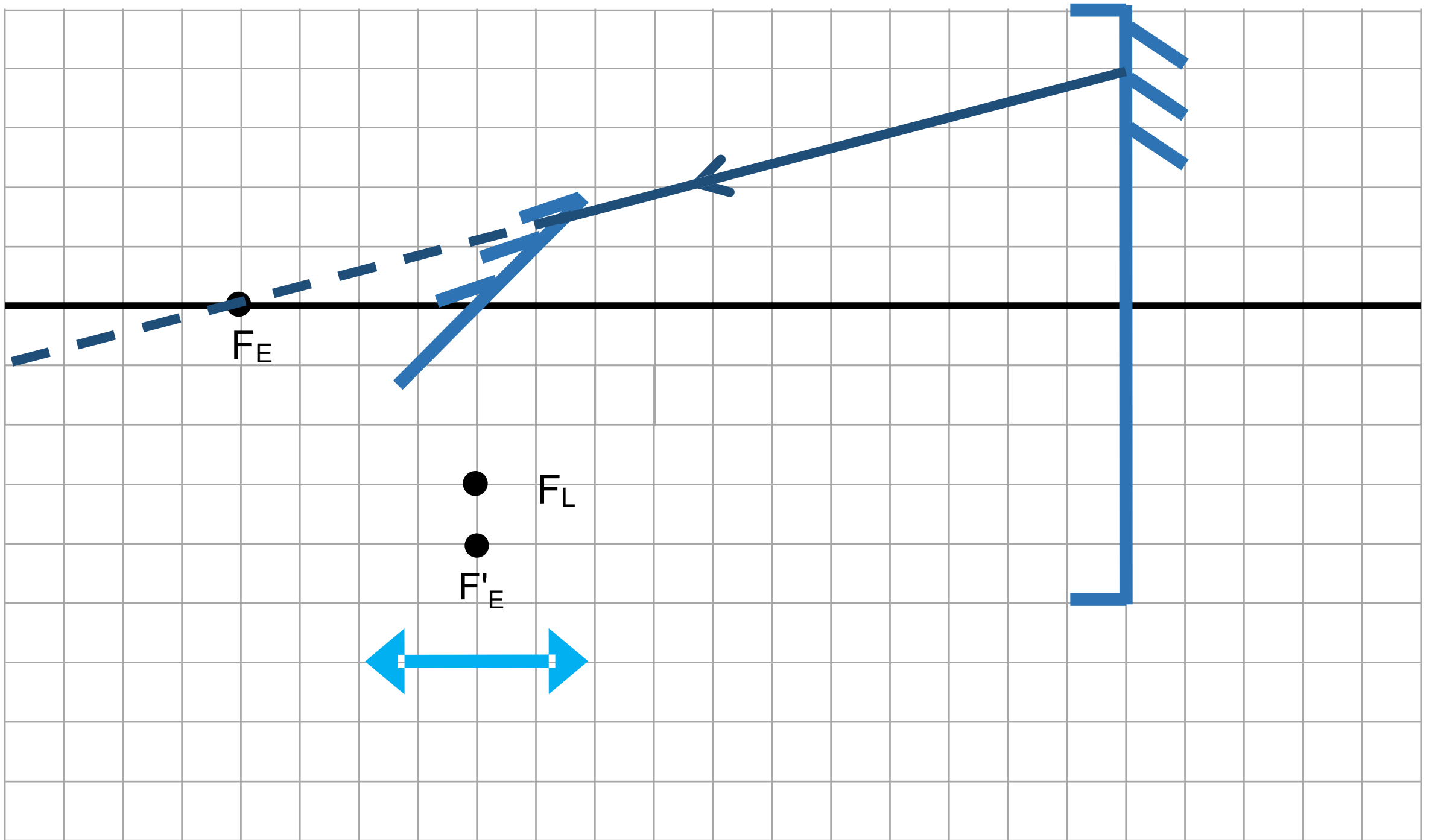


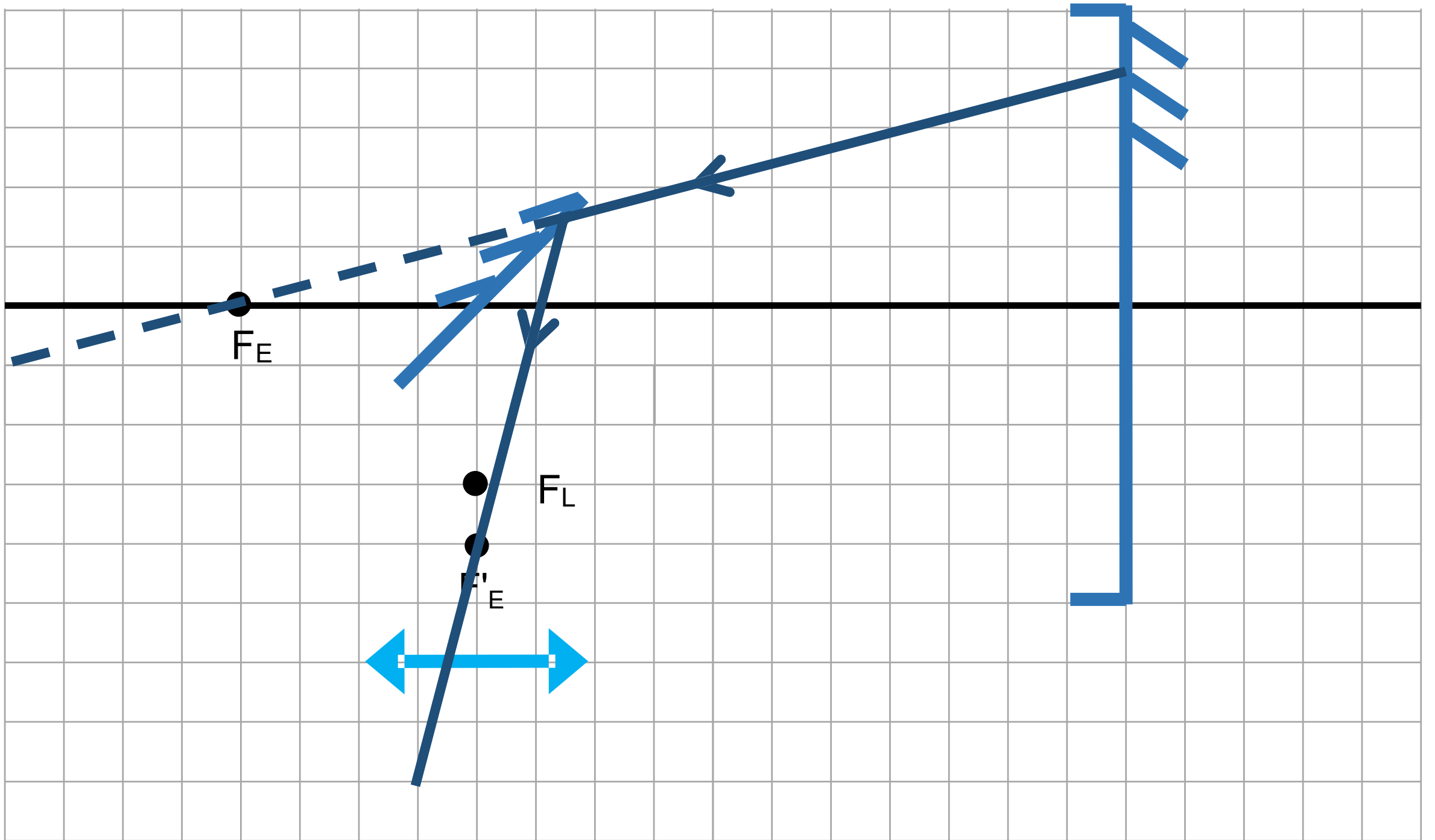


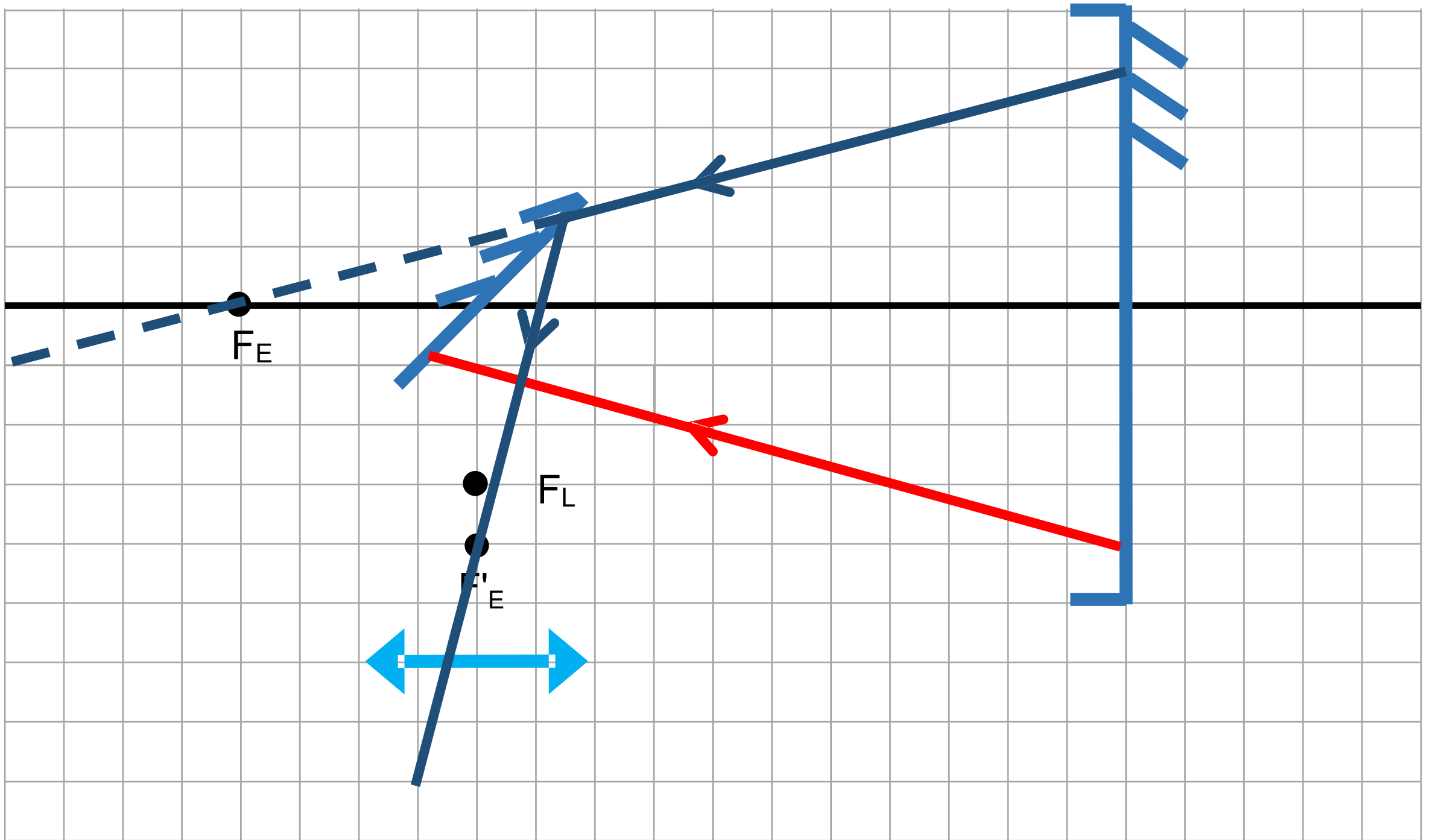


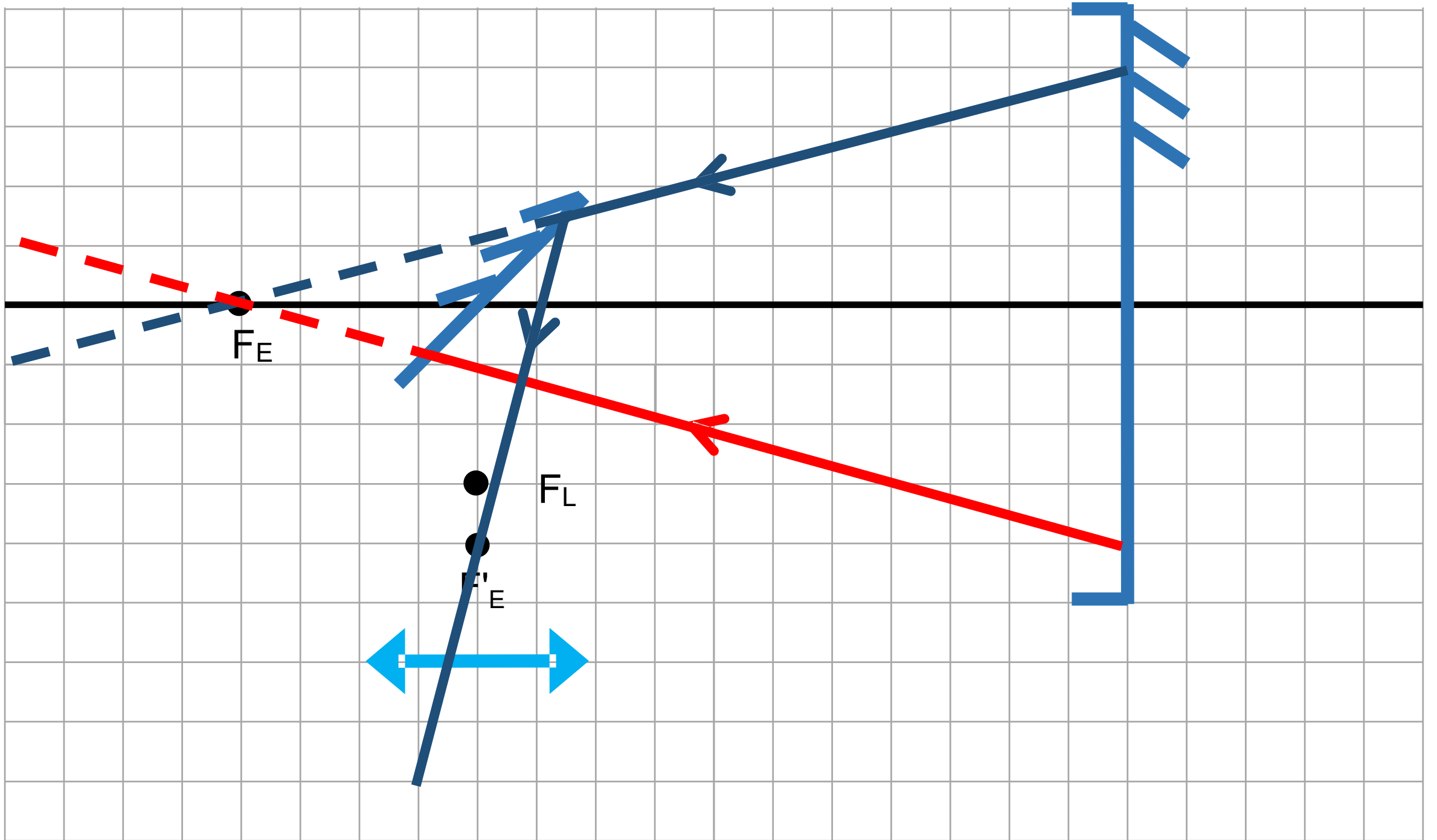


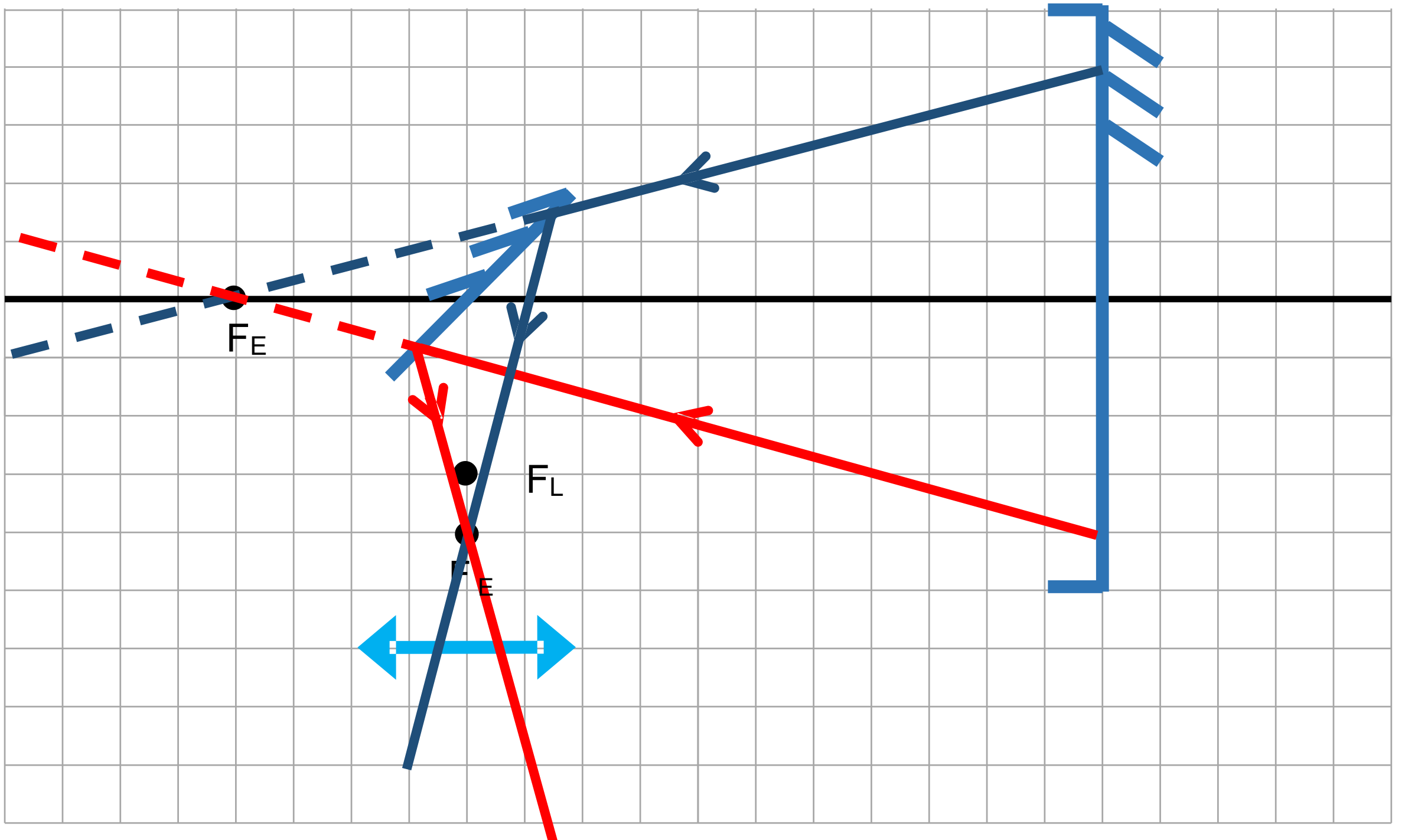


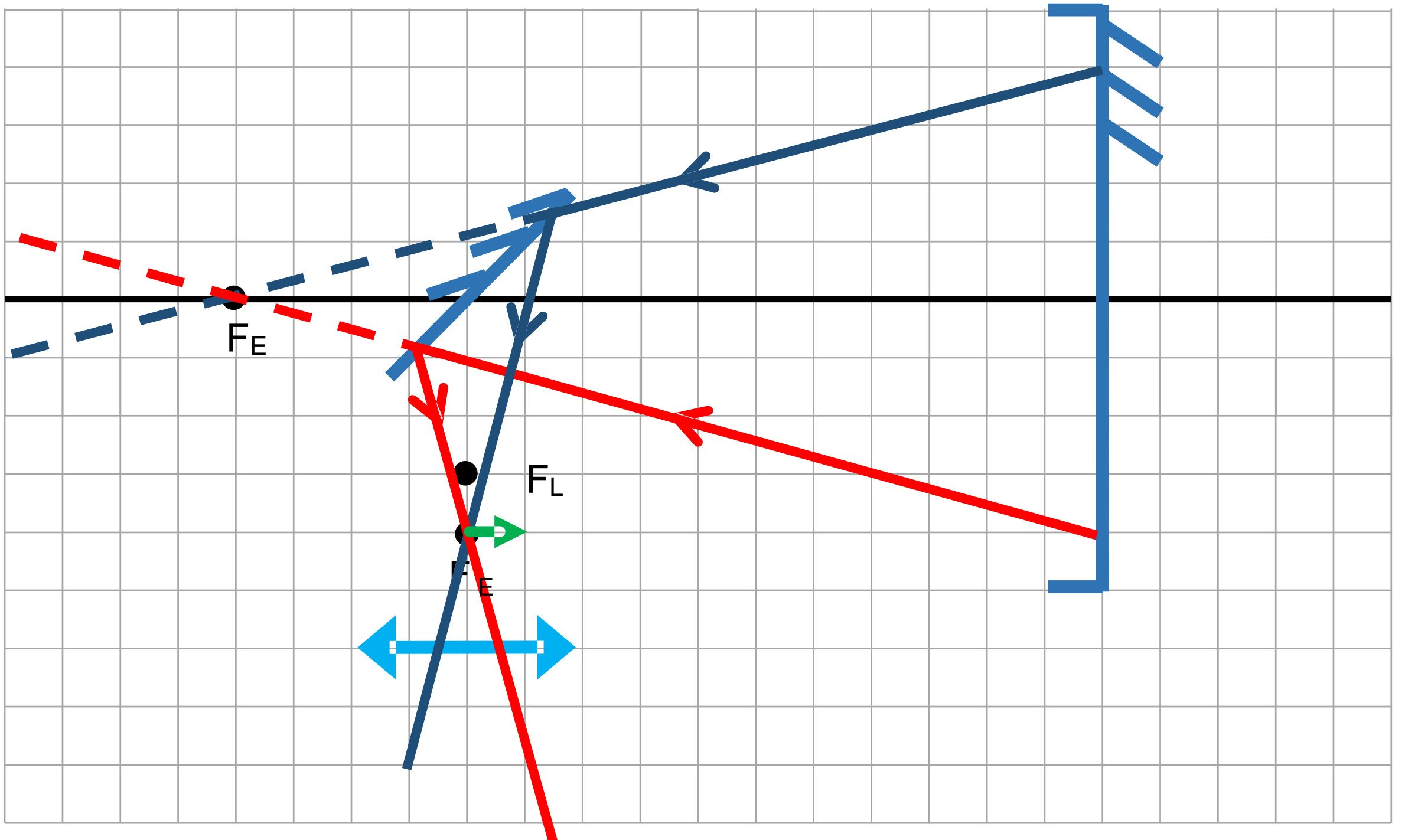


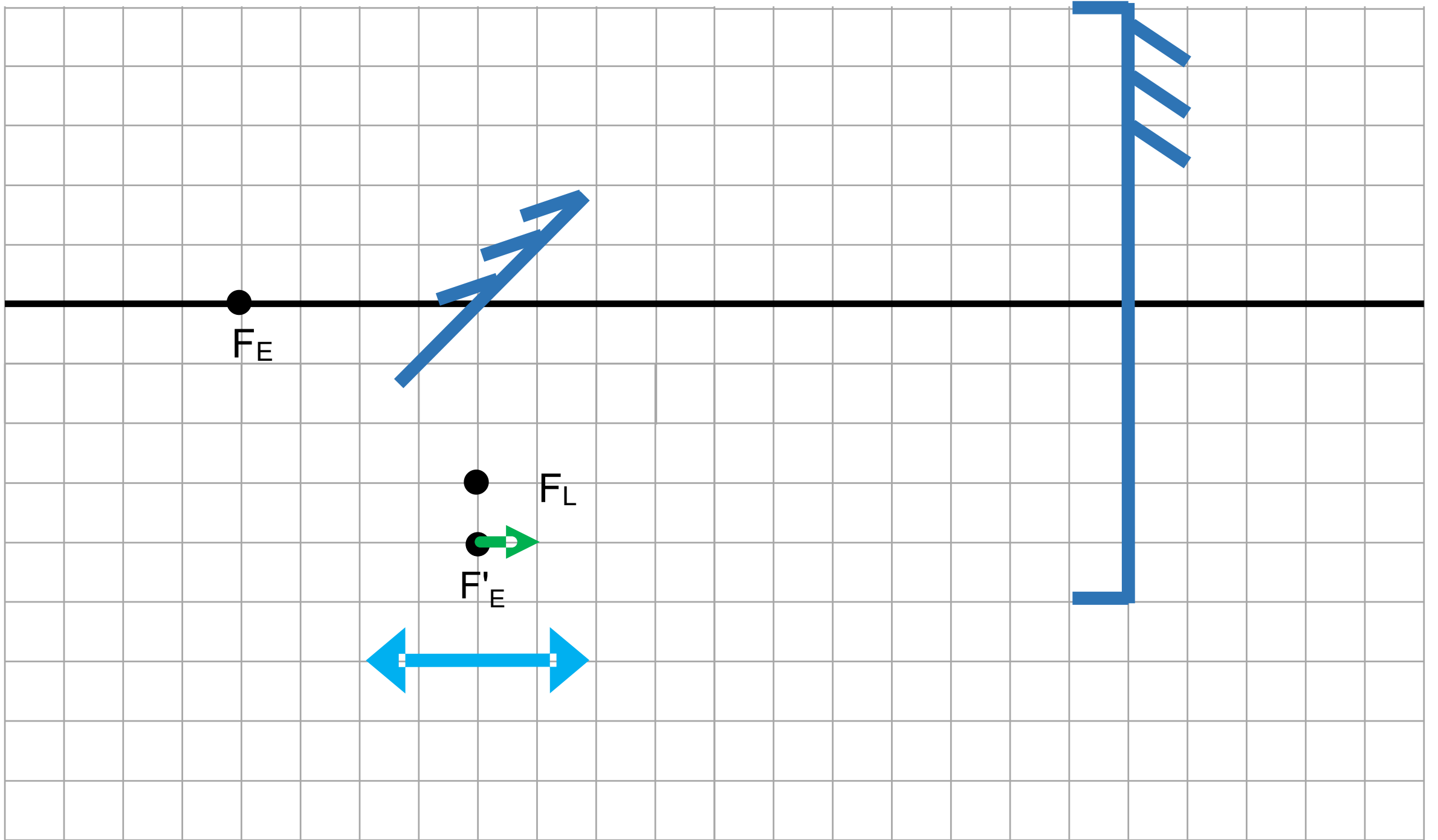


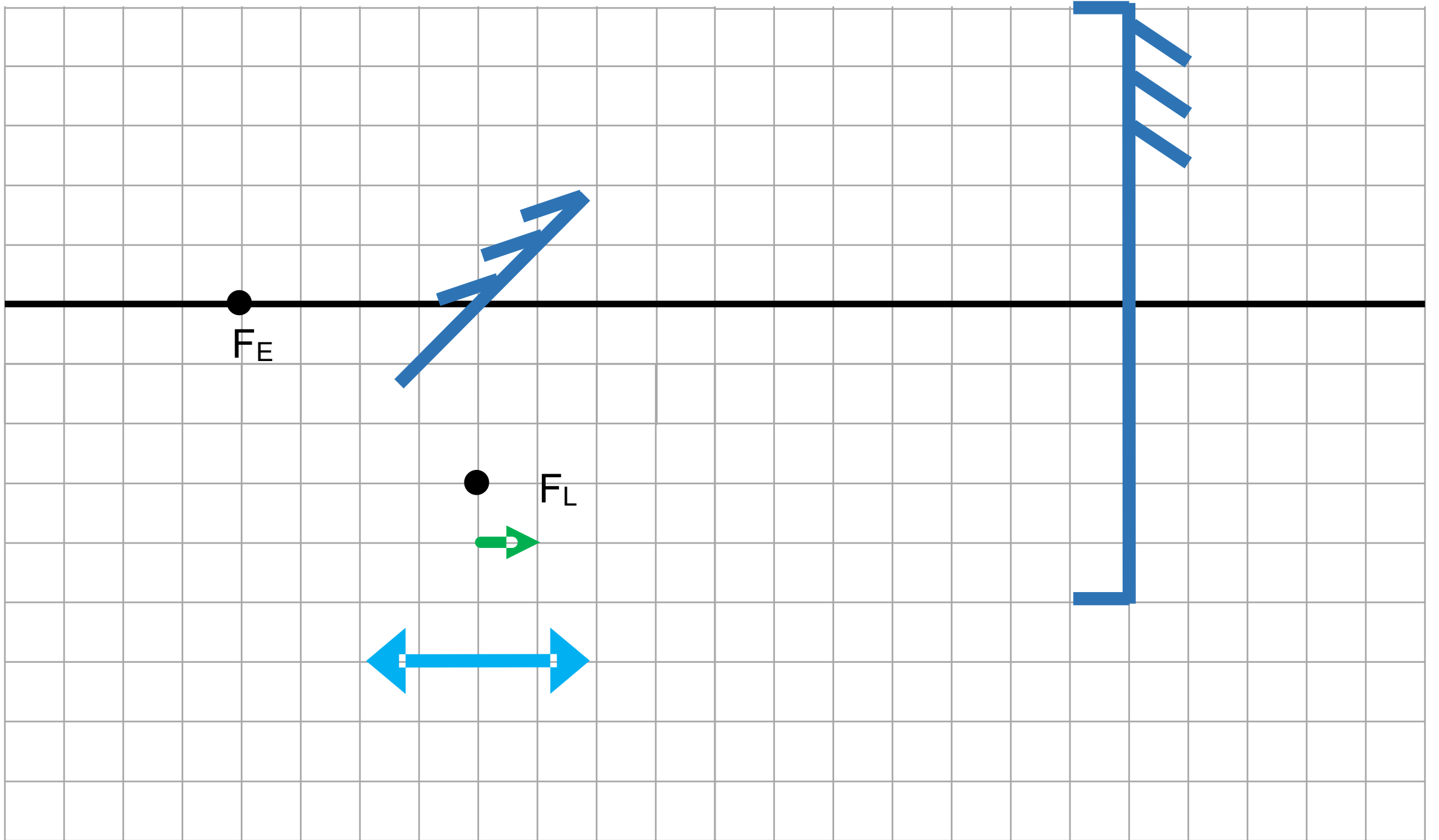


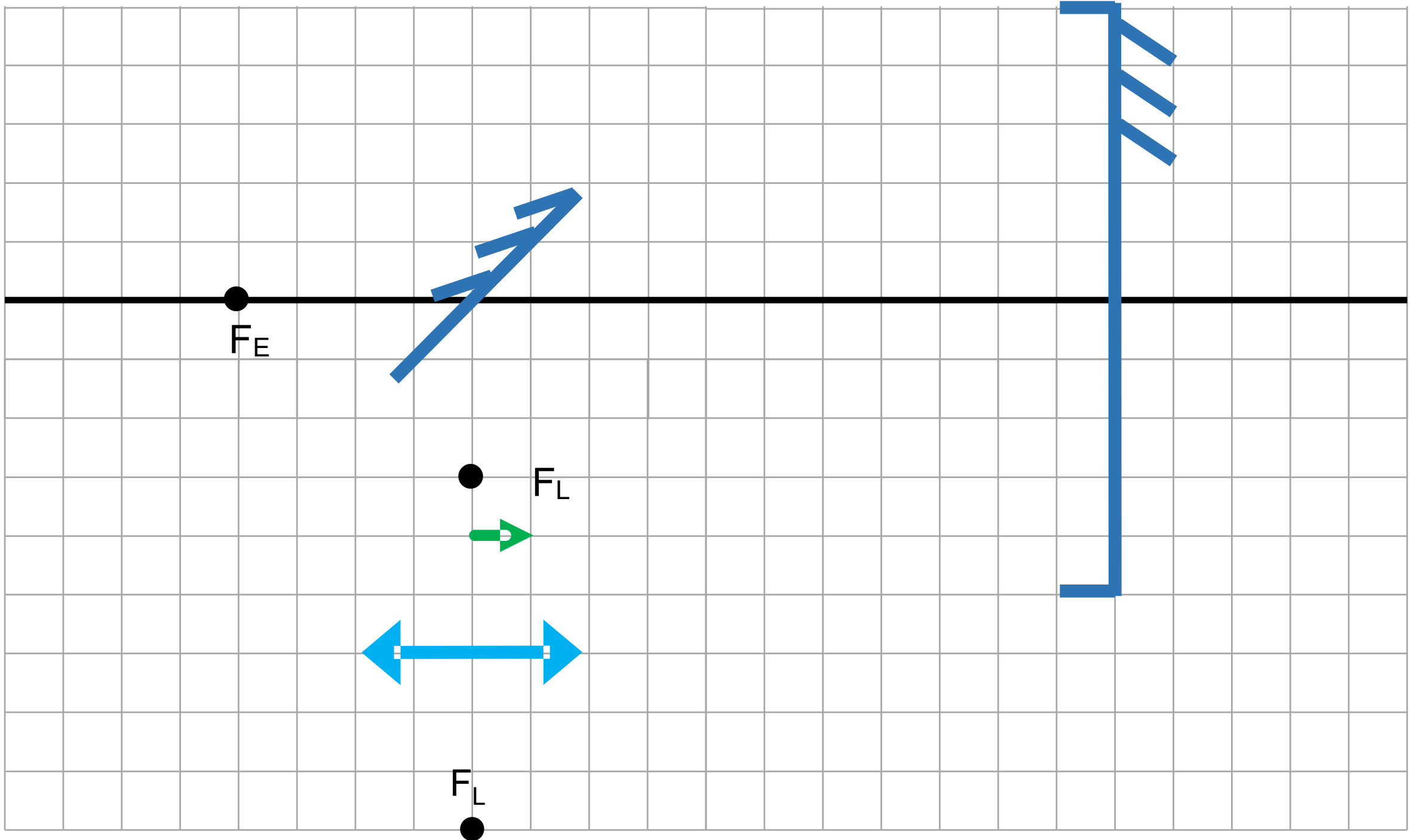


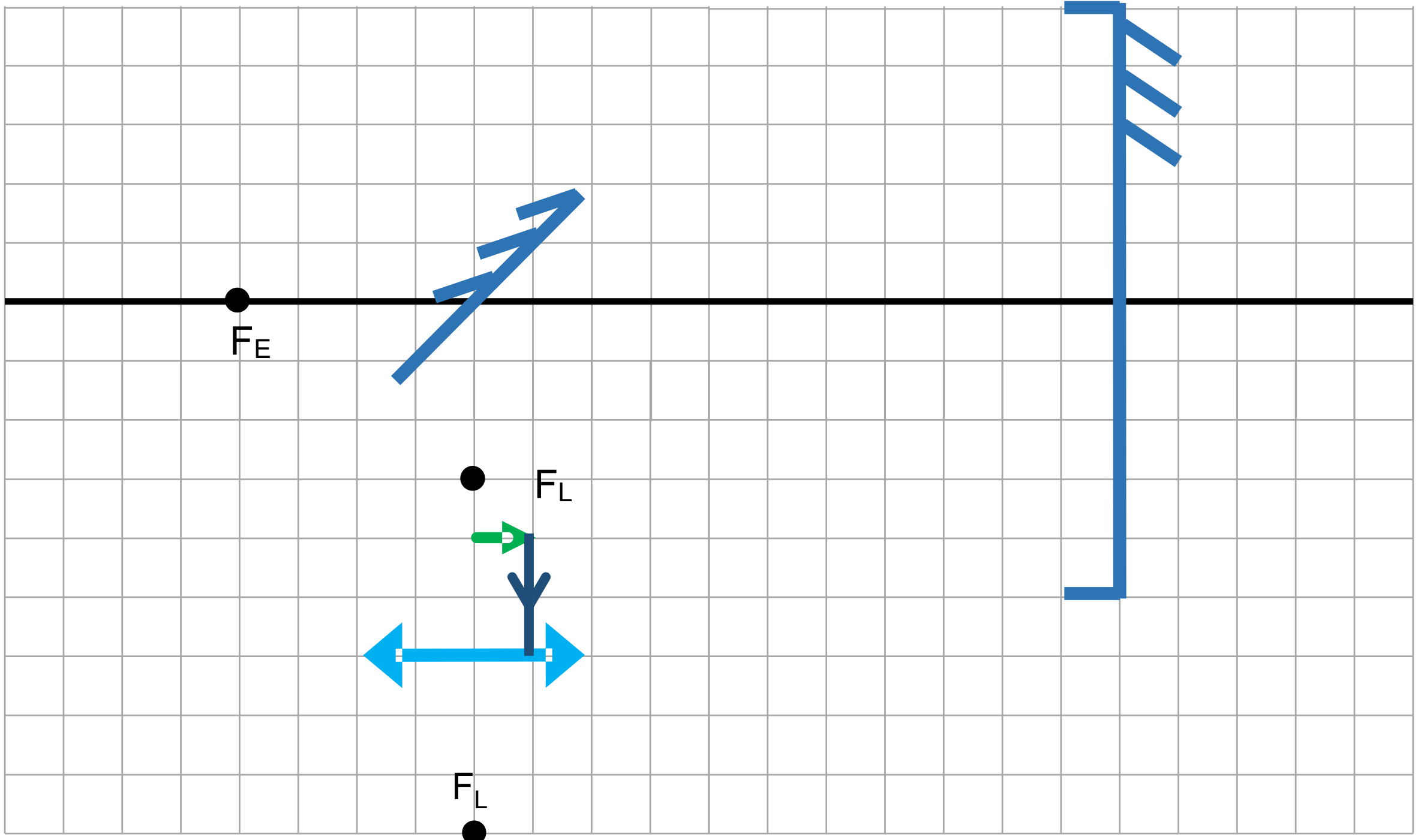


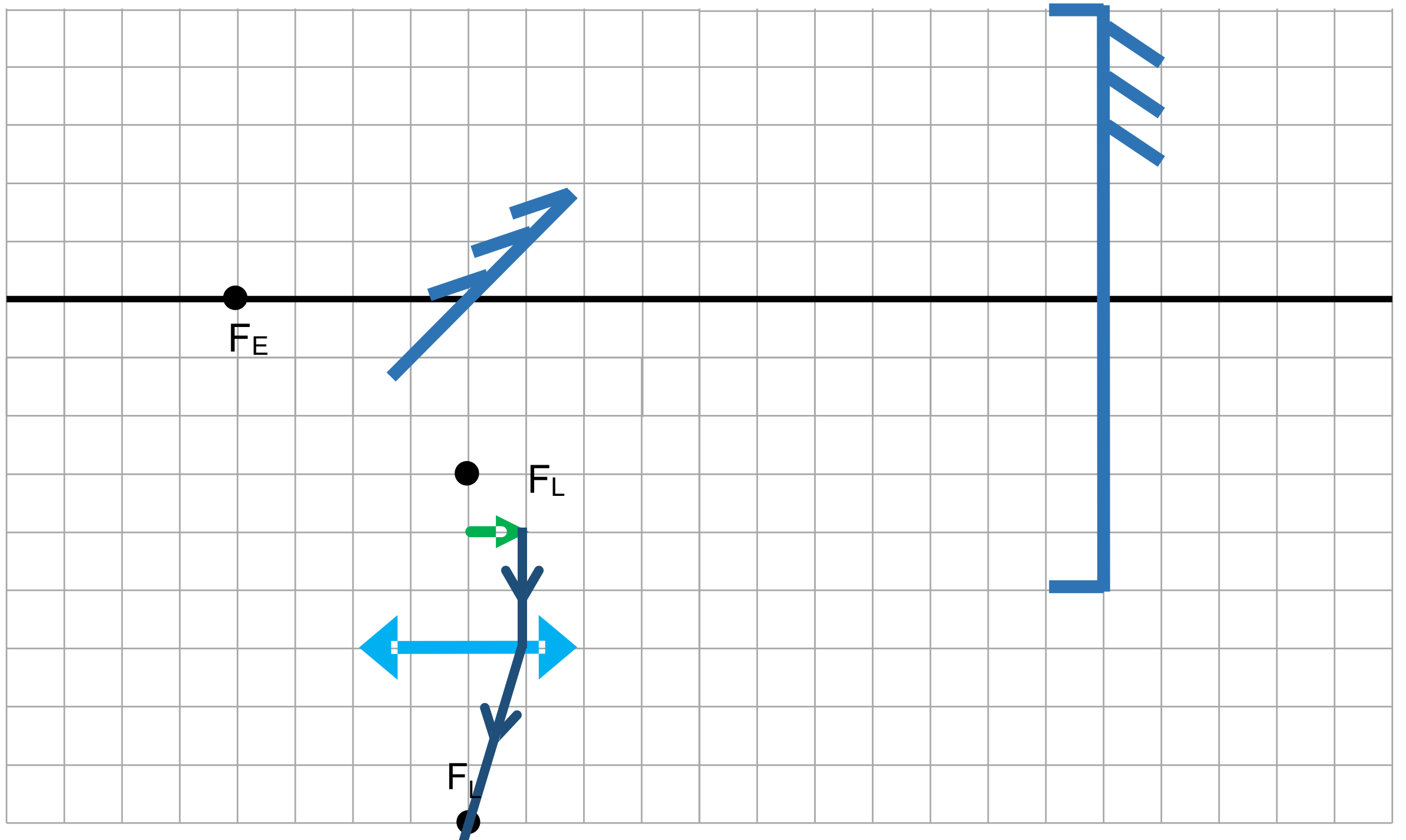


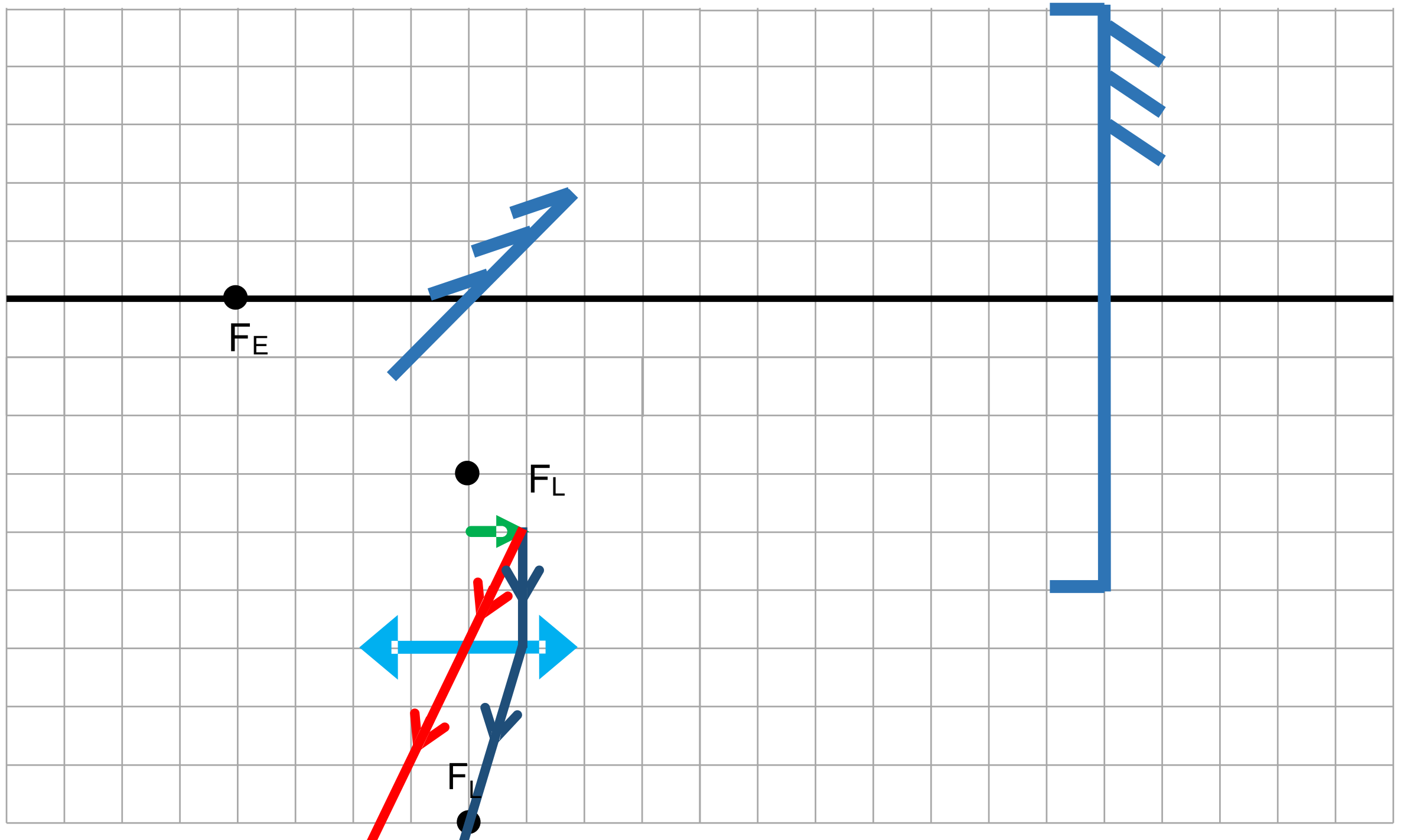


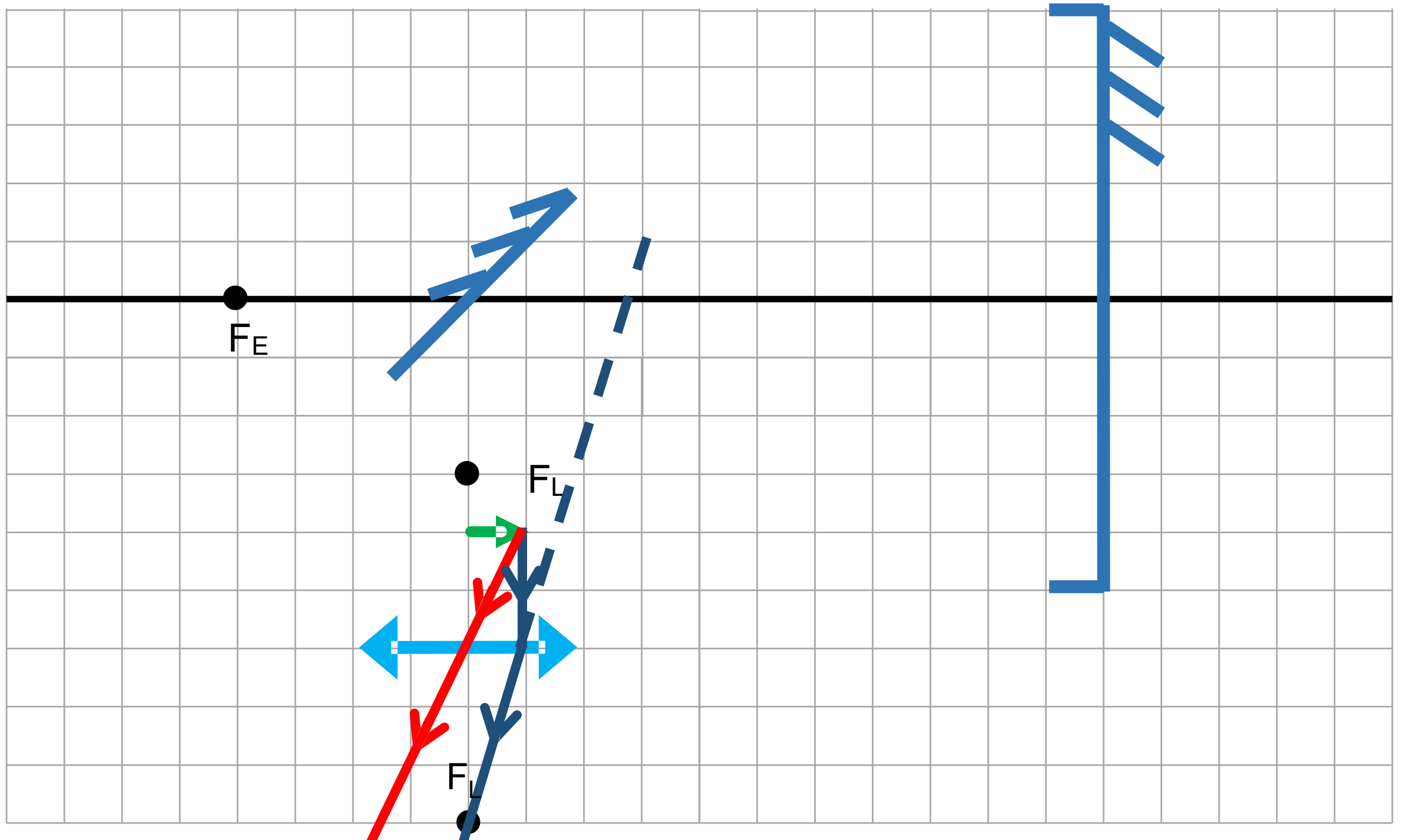


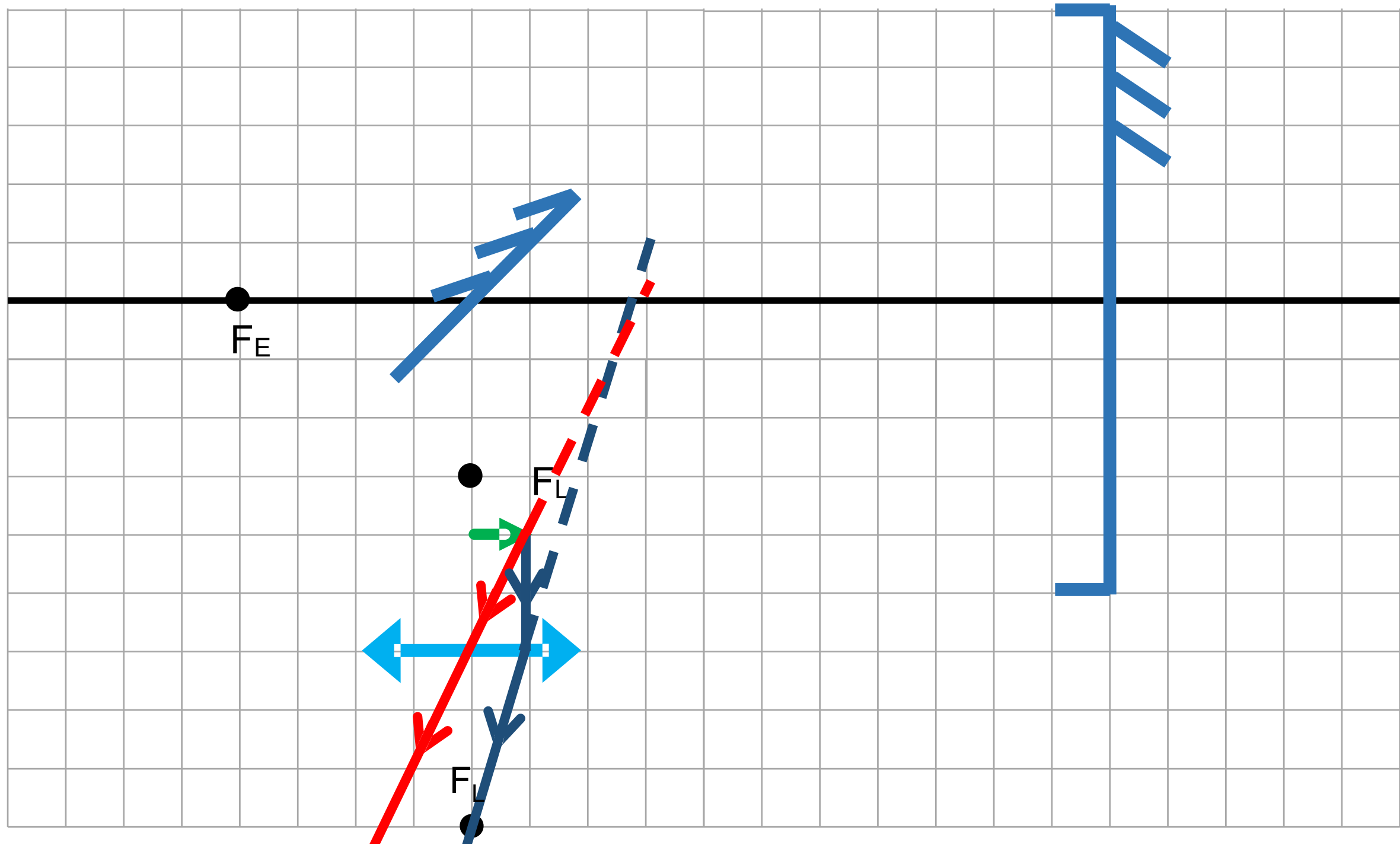


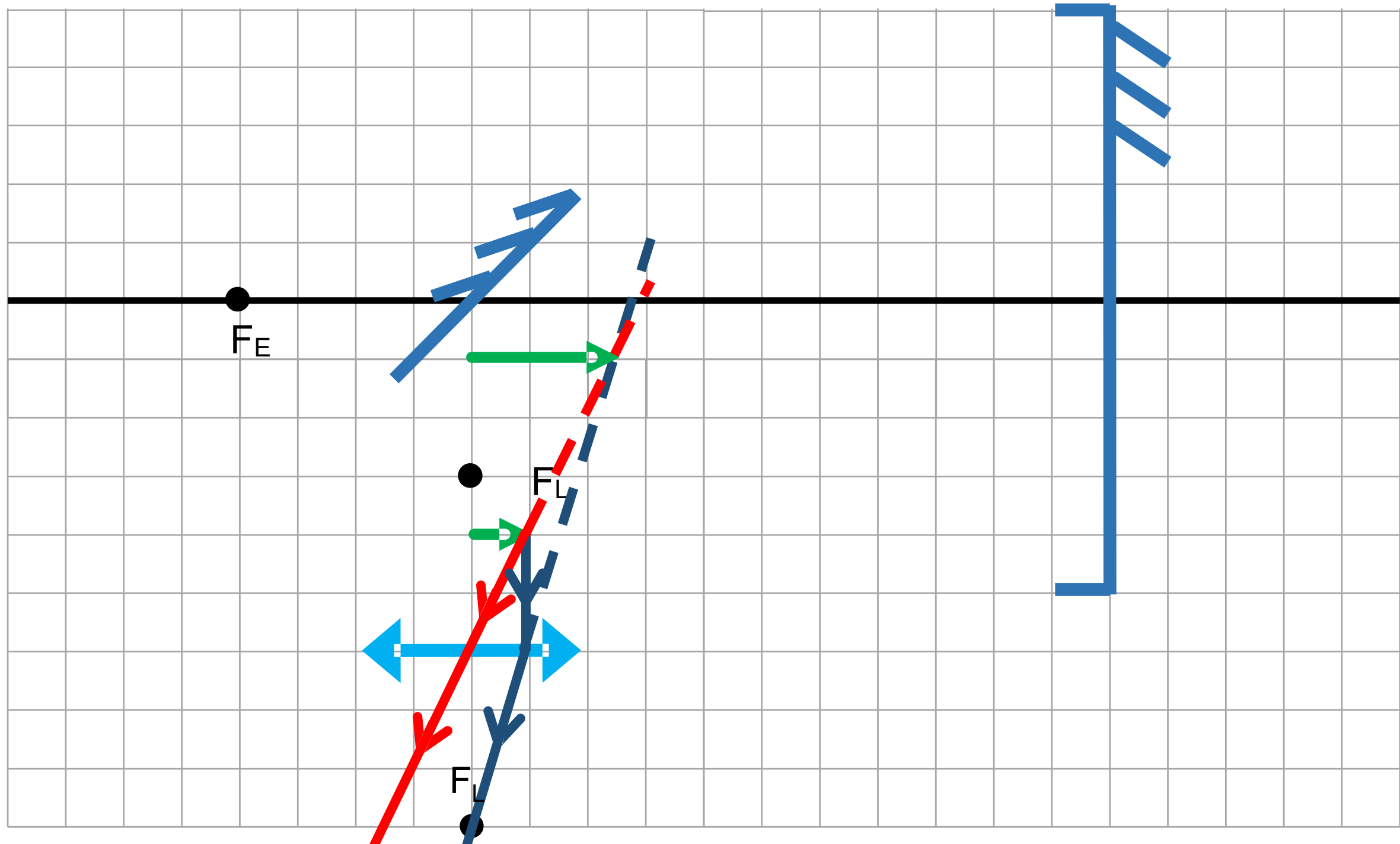


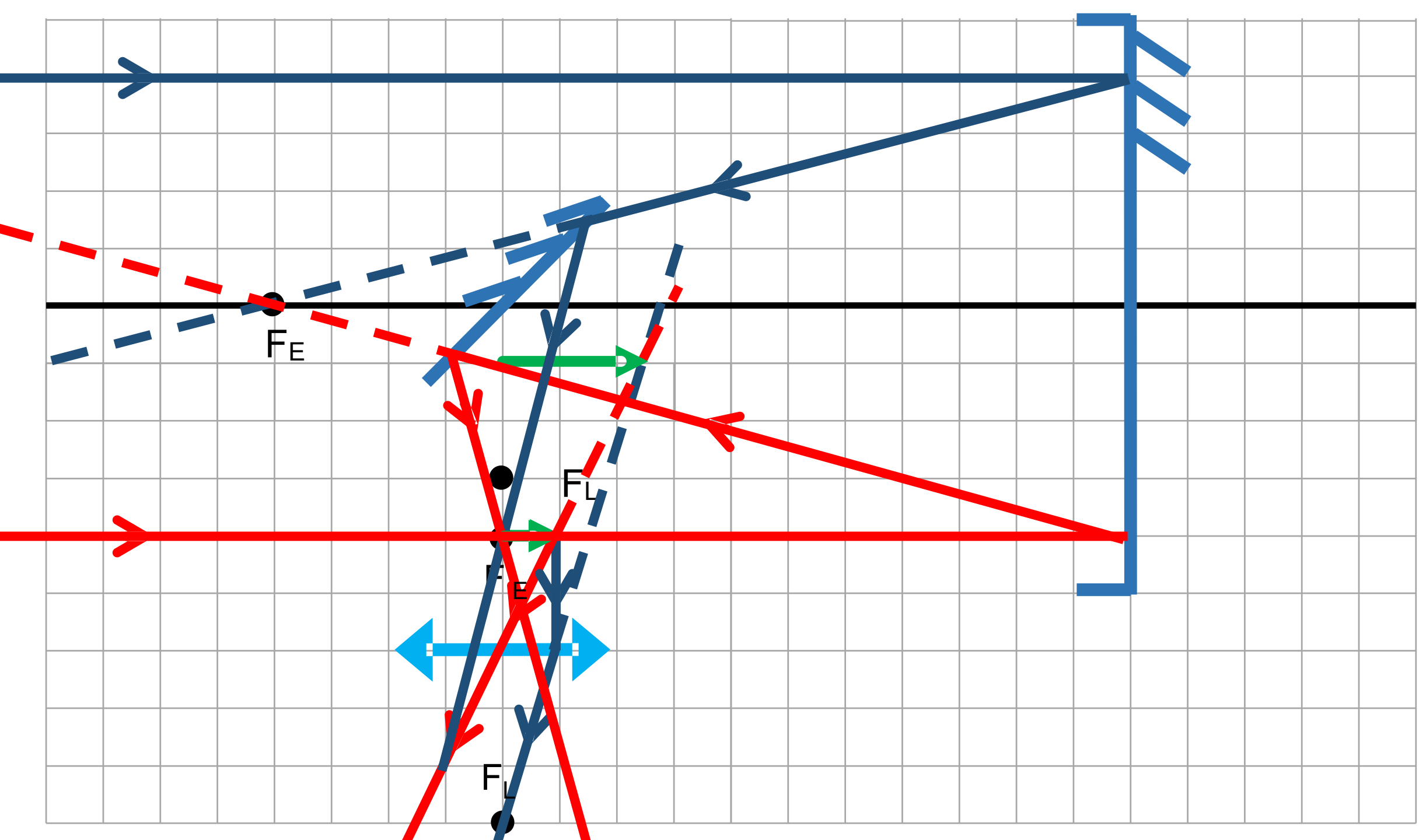




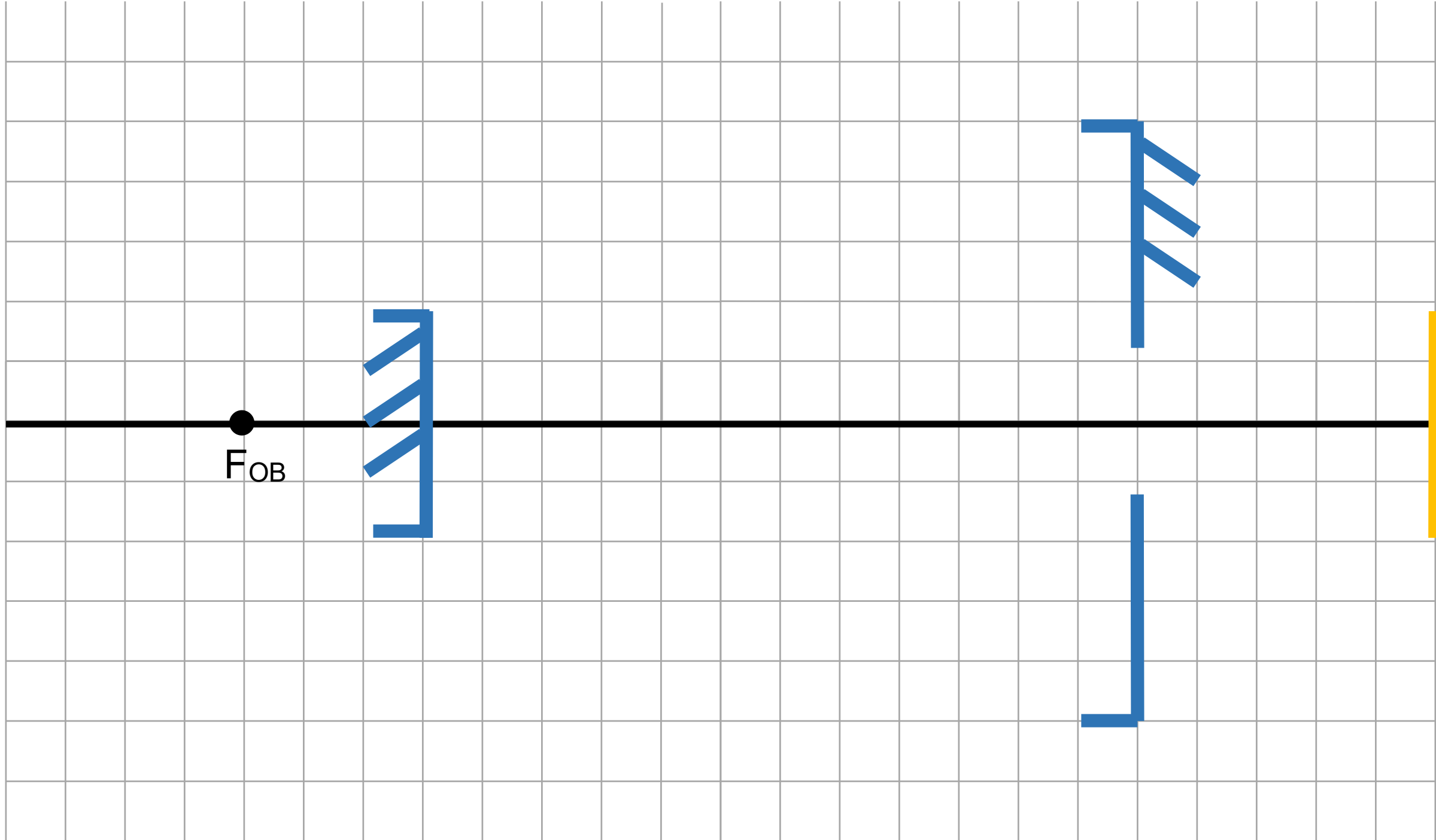


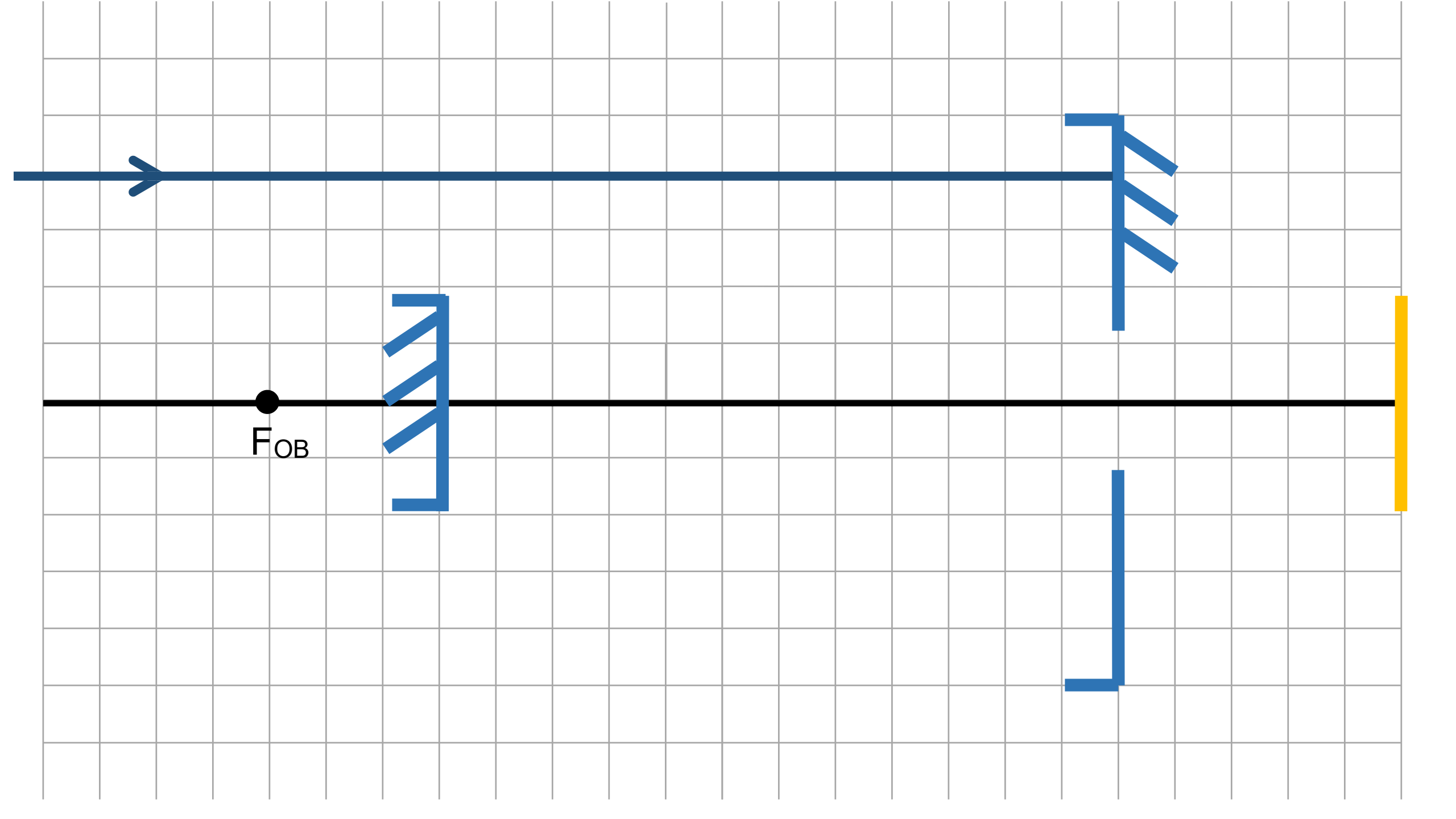


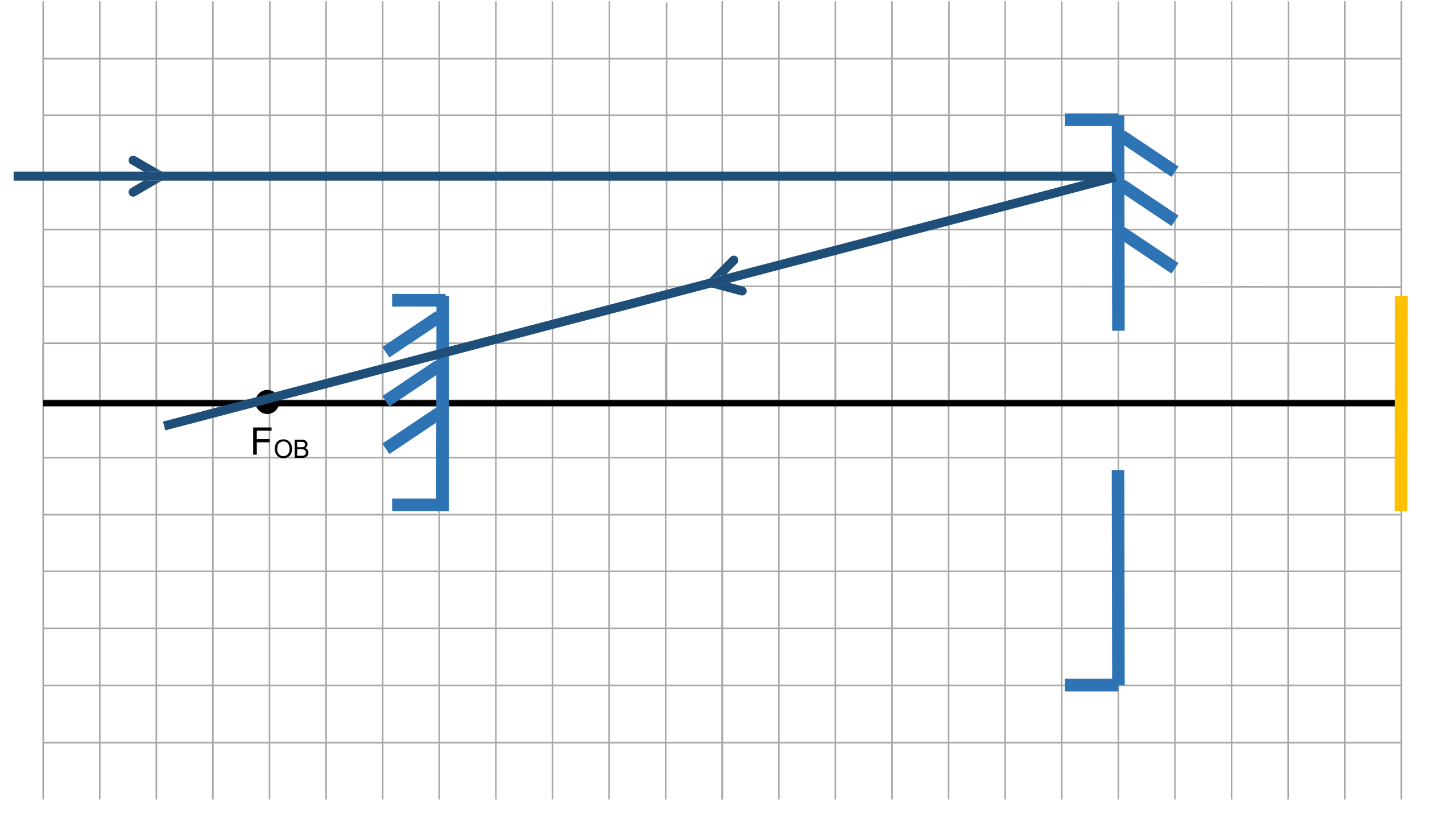


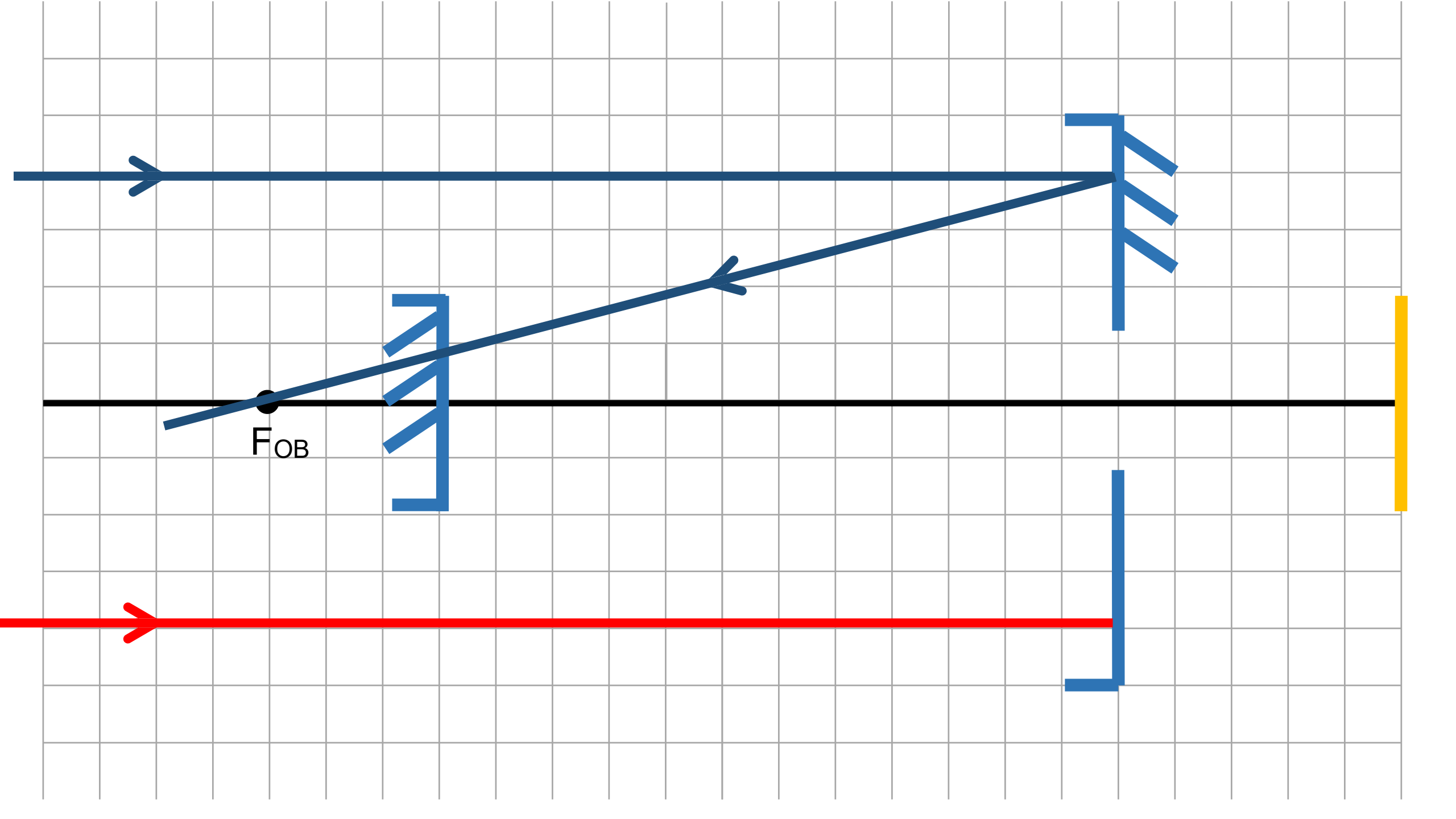


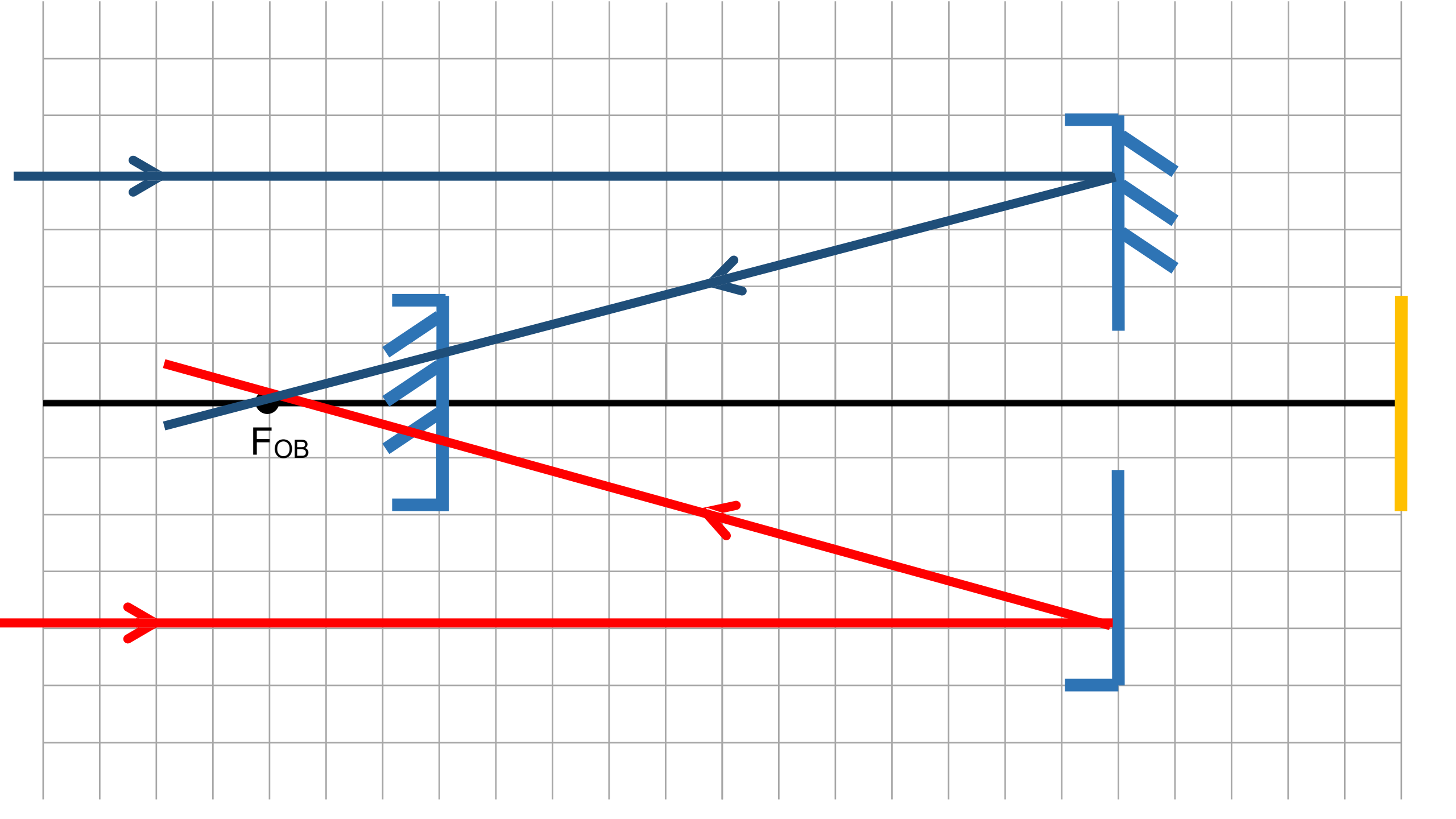
TELESCÓPIO CASSEGRAIN (MODELO DO HUBBLE)

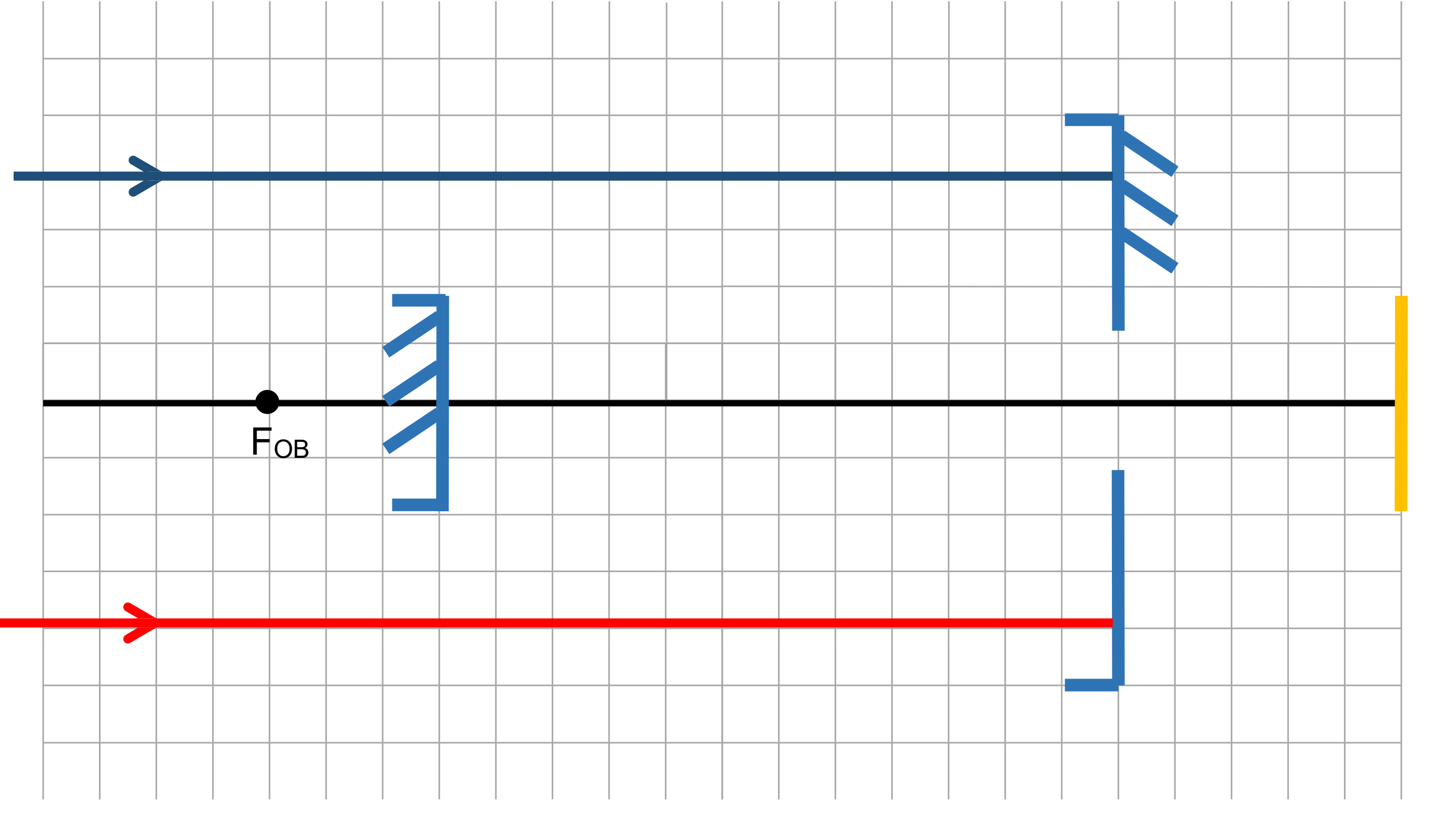


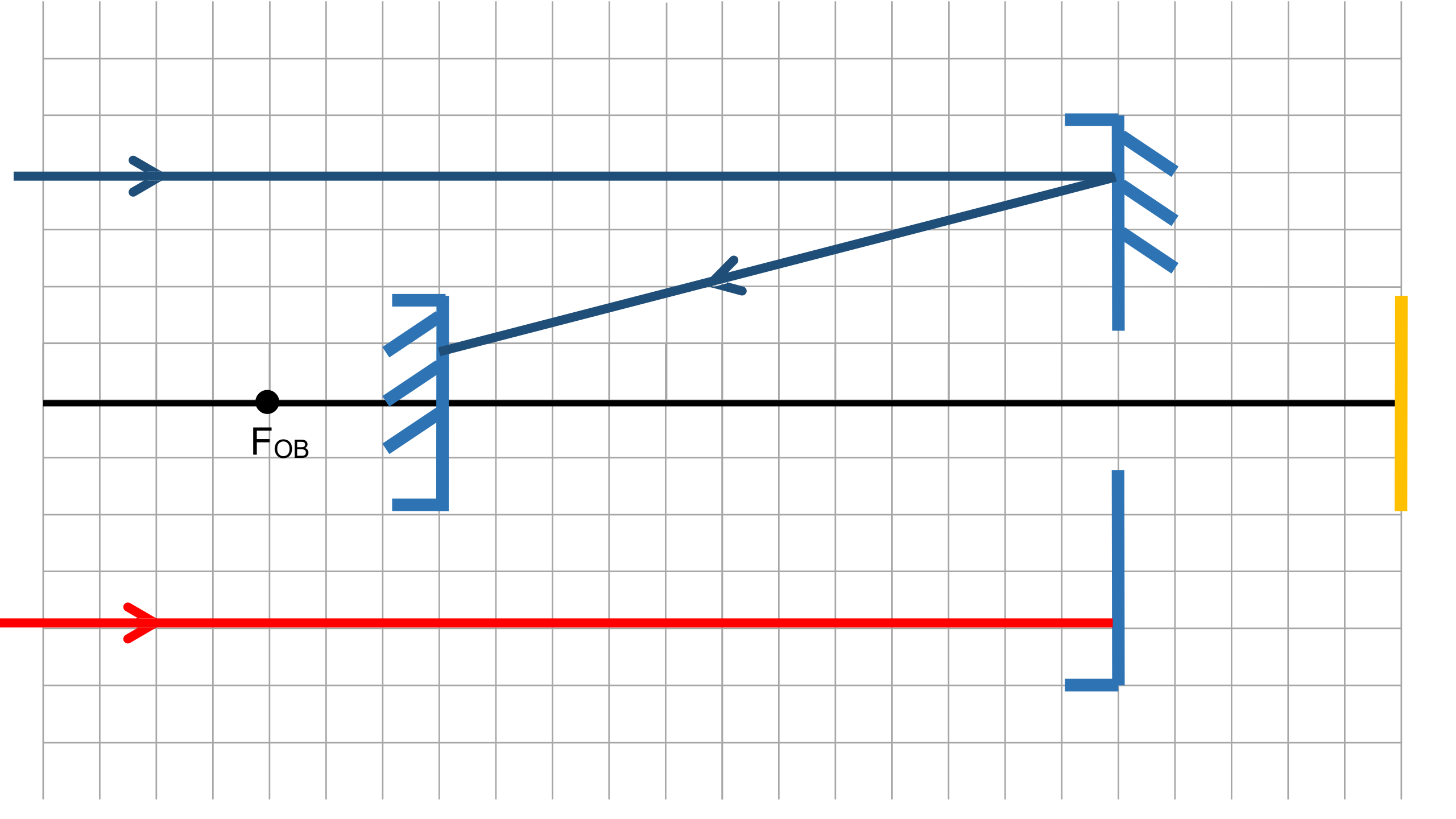


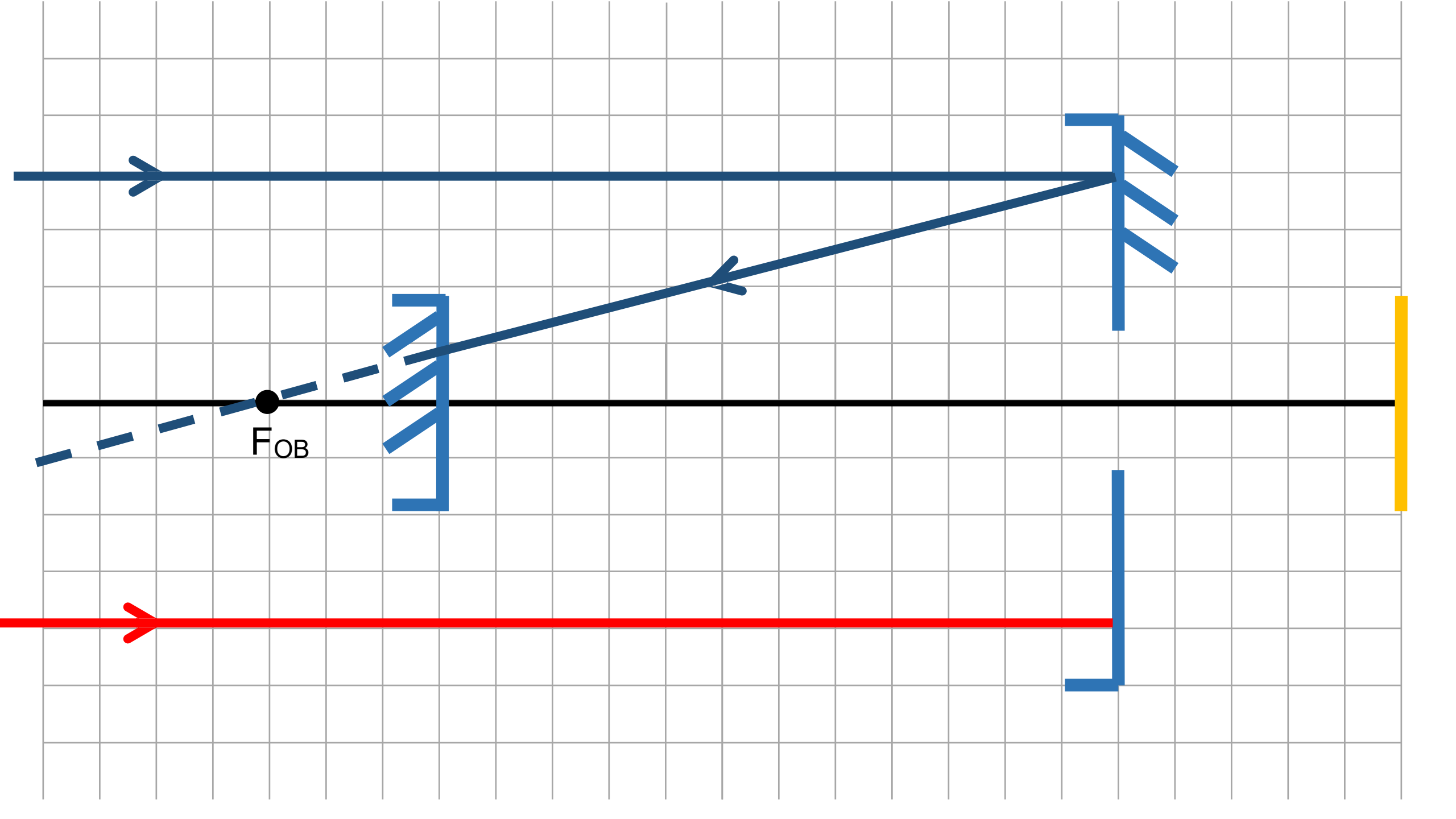


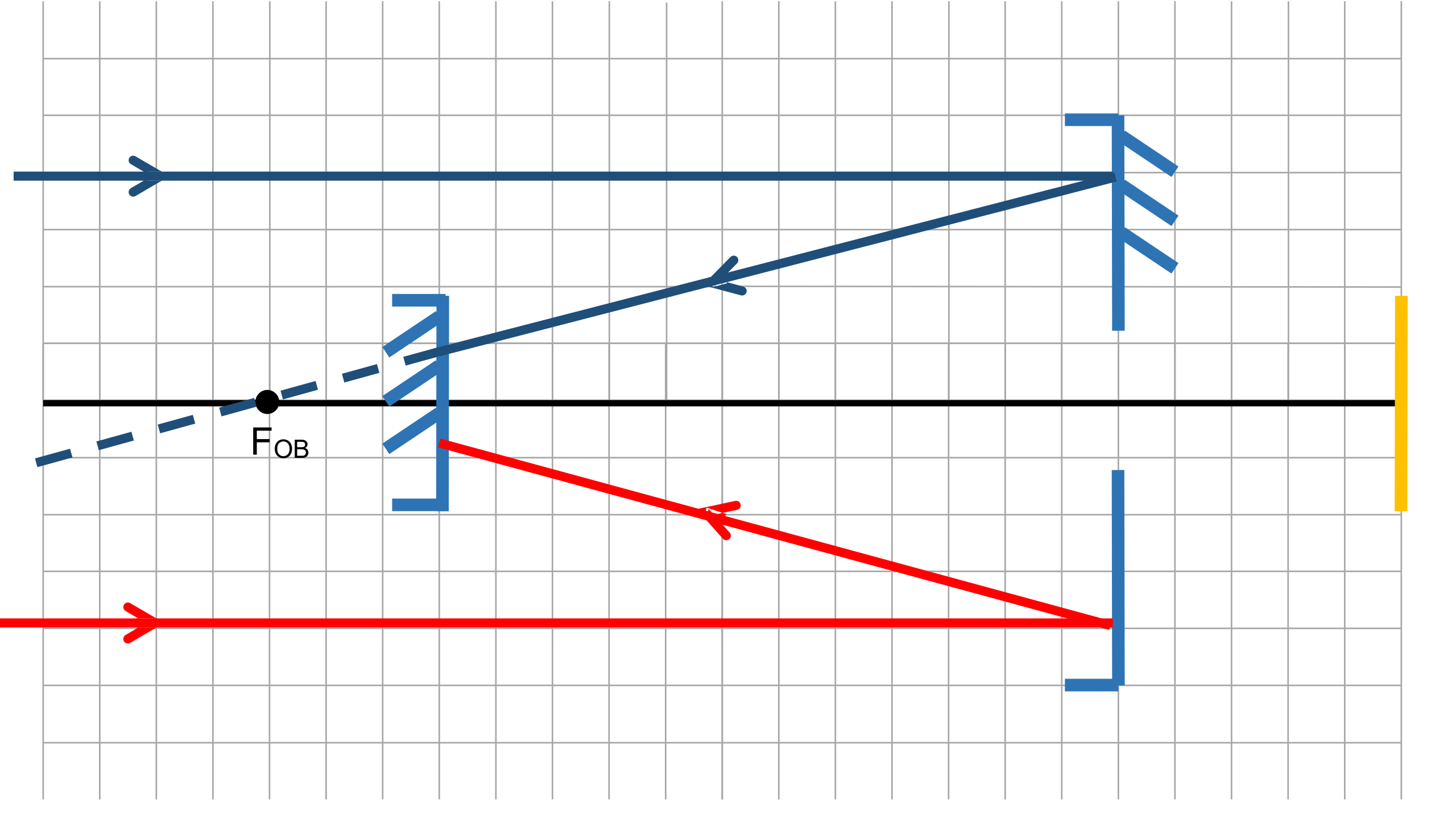


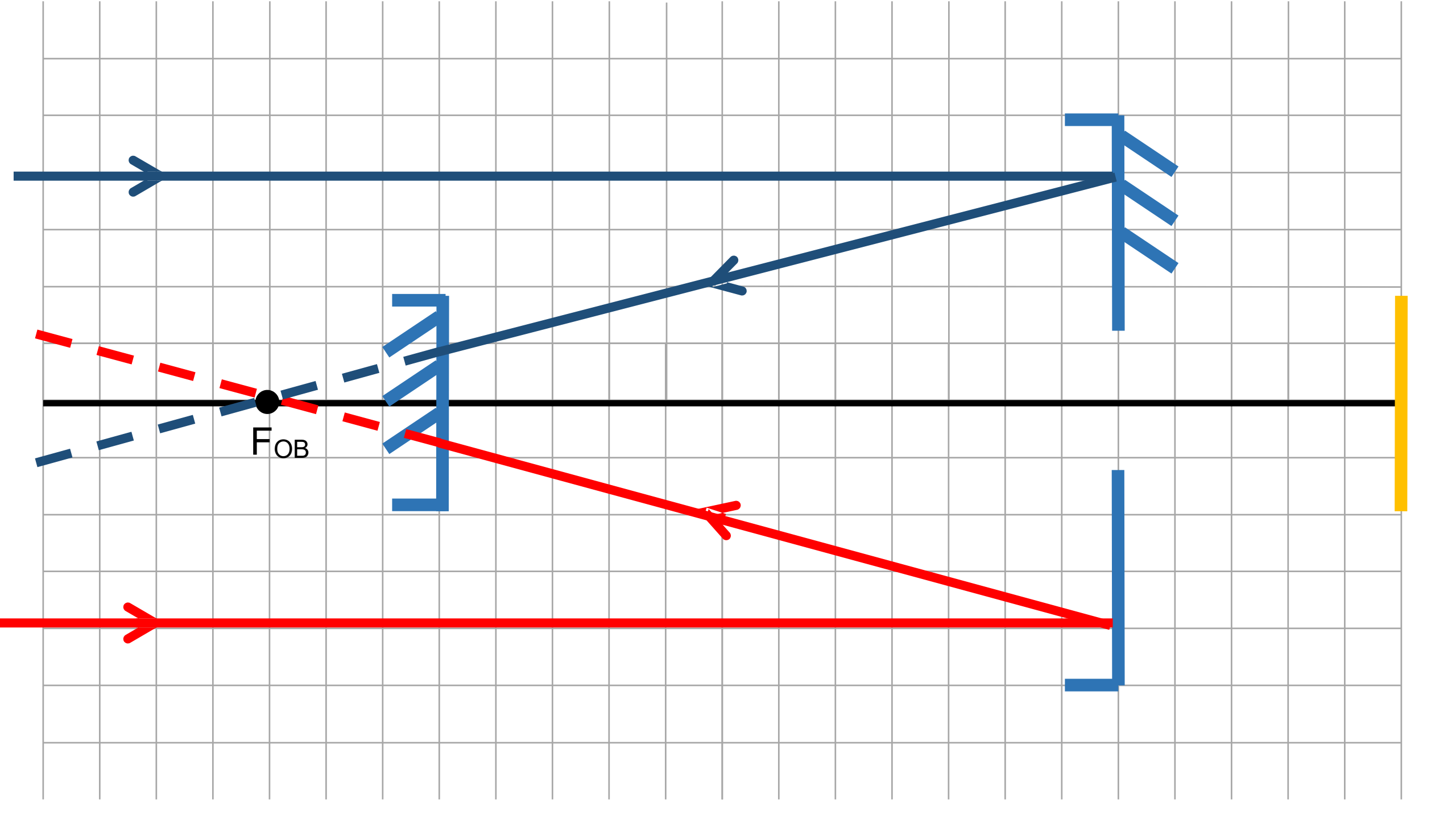












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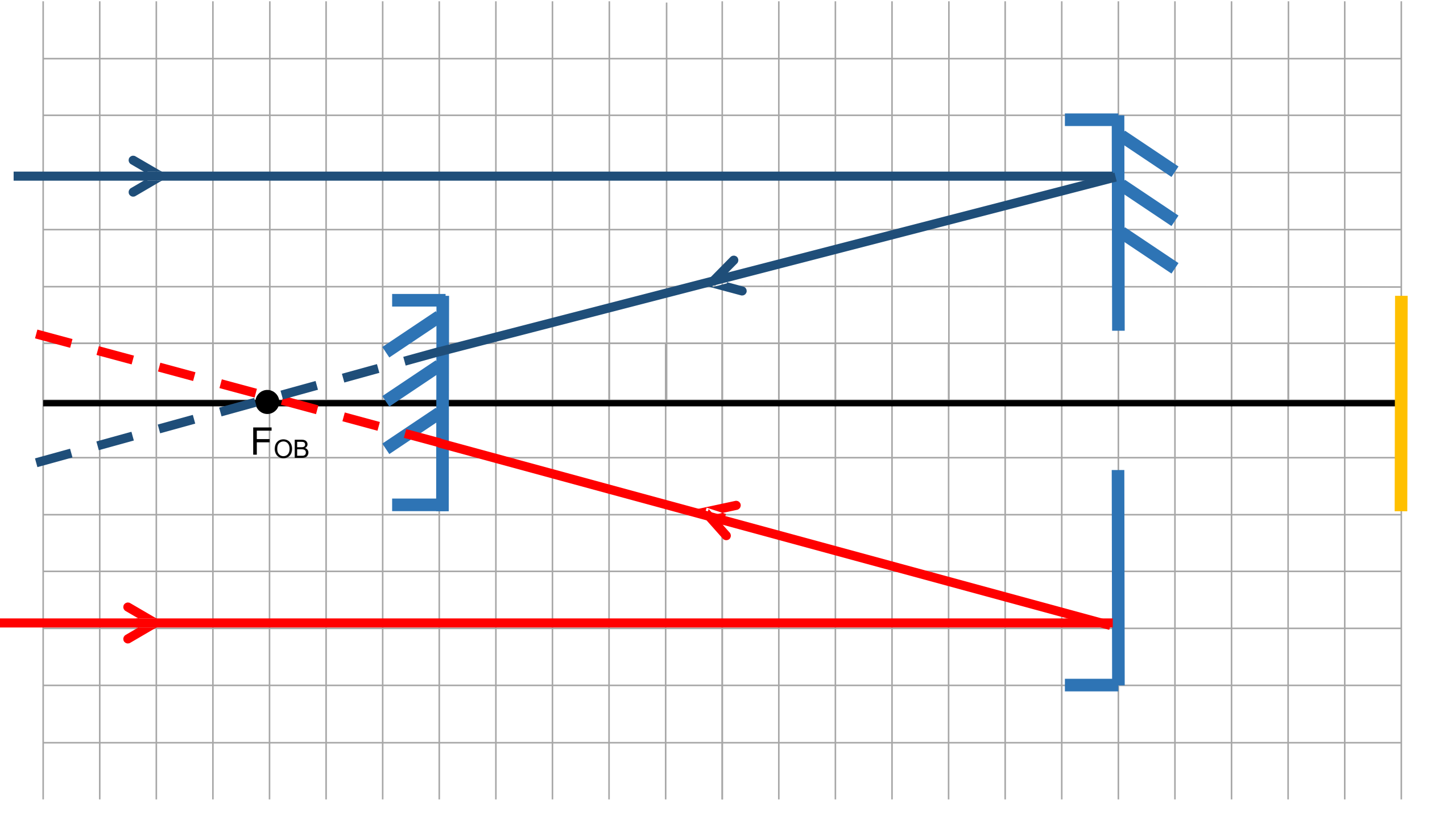
$$\frac{1}{p'} = \frac{1}{3} - \frac{1}{3,64} \Rightarrow$$

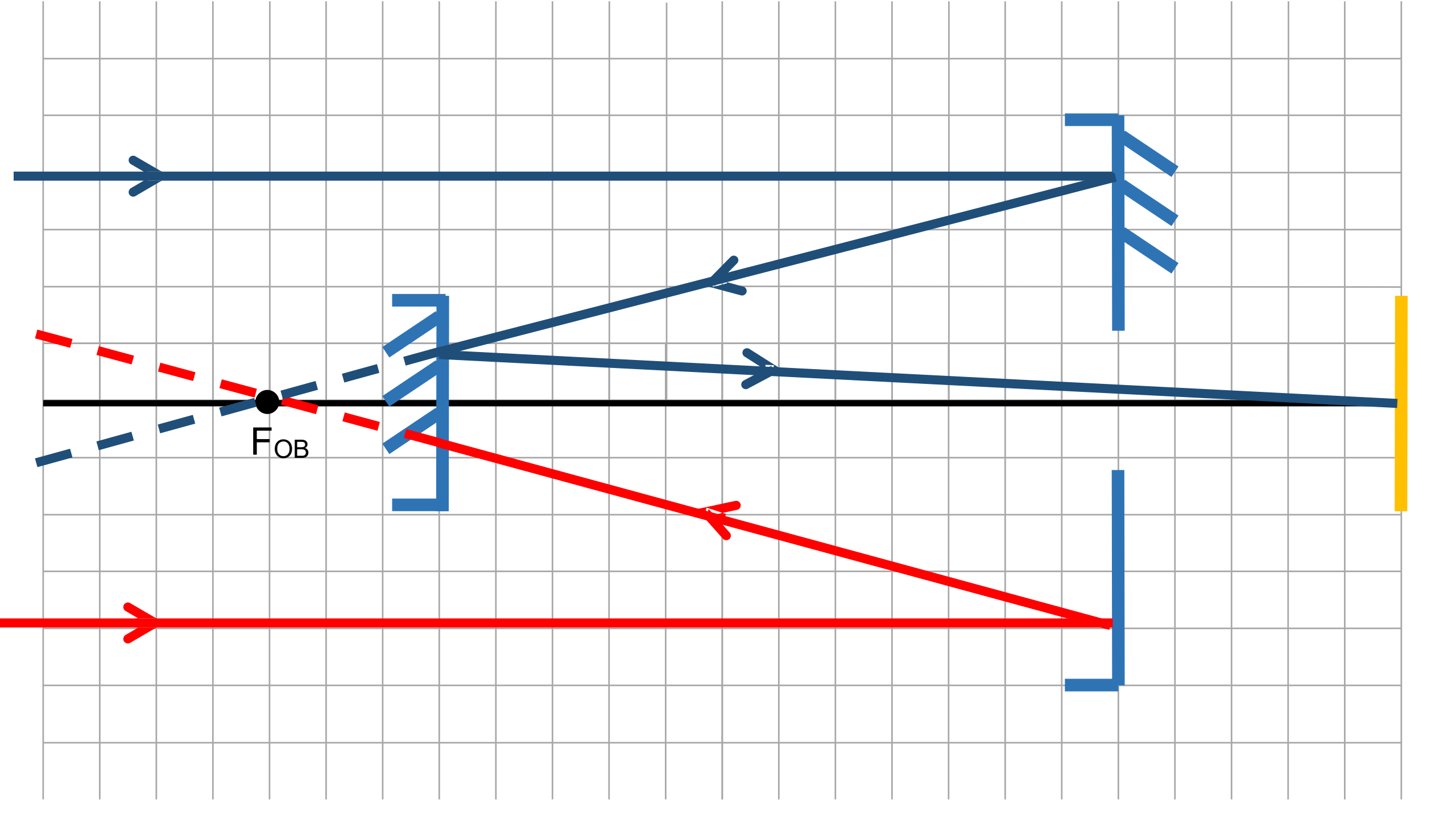
$$\frac{1}{p'} = \frac{3,64 - 3}{10,92} \Rightarrow$$

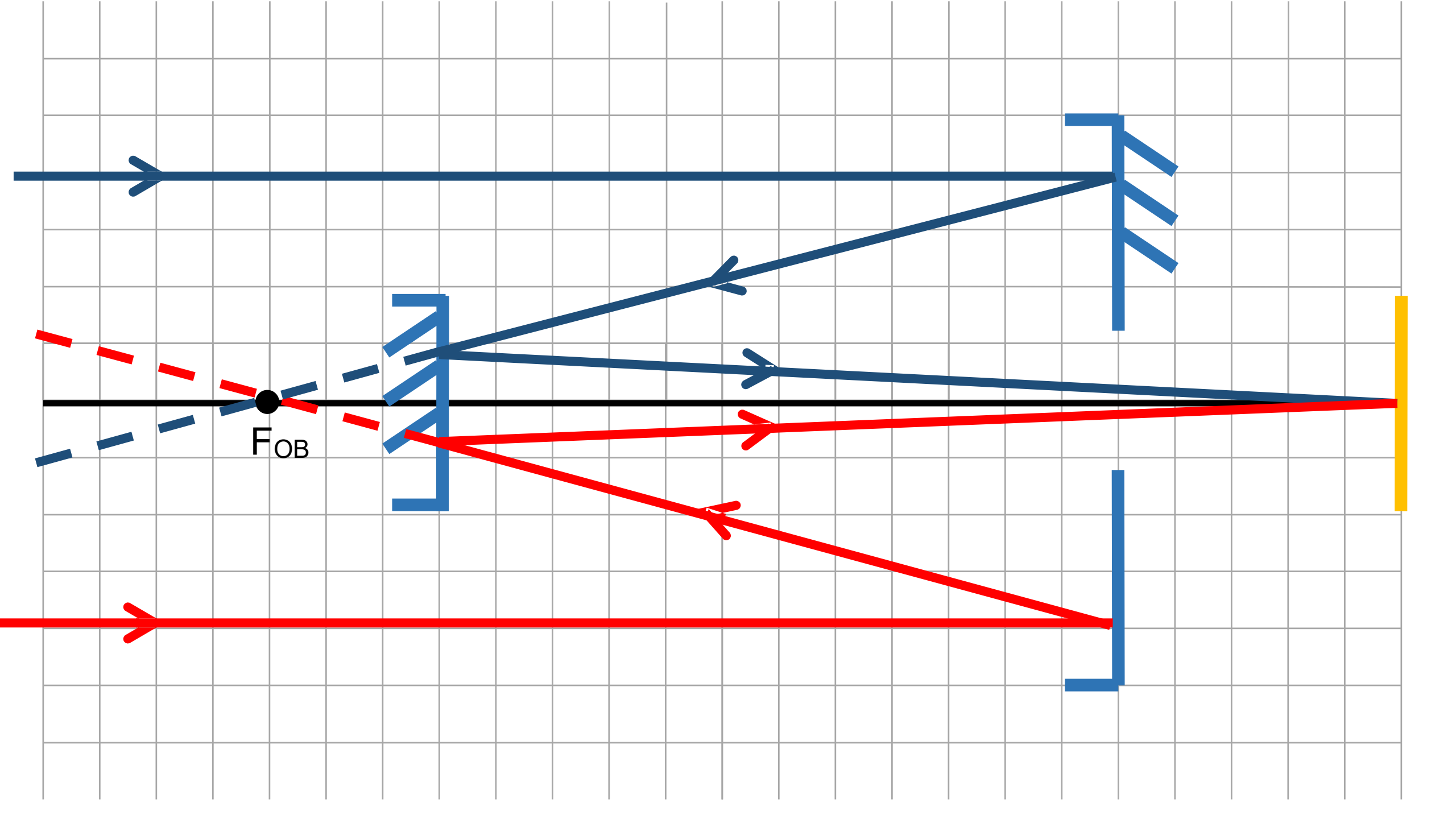
$$\frac{1}{p'} = \frac{0,64}{10,92} \Rightarrow$$

$$p' = \frac{10,92}{0,64} \Rightarrow$$

$$p' = 17 \text{ cm}$$







FIM