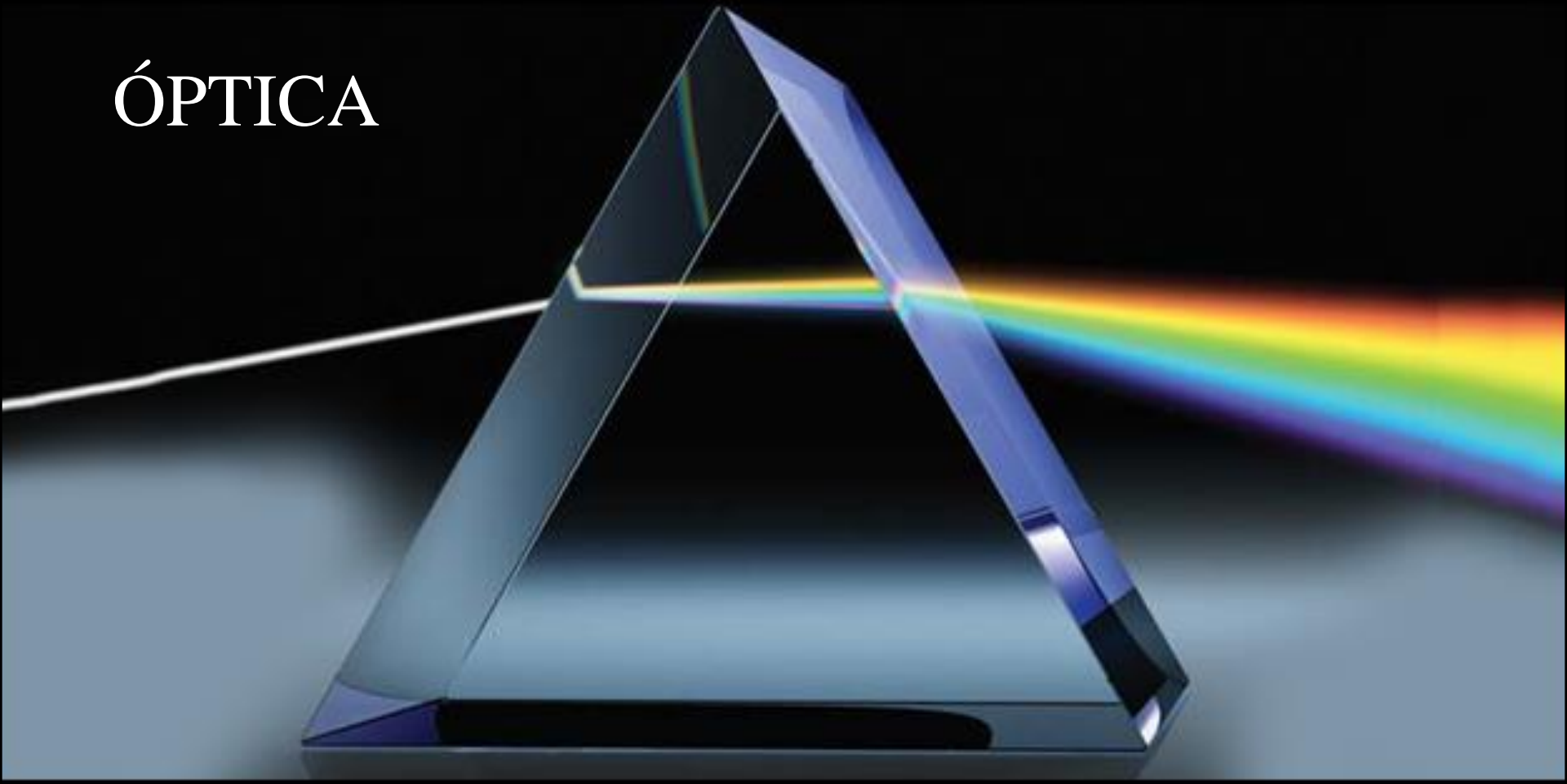
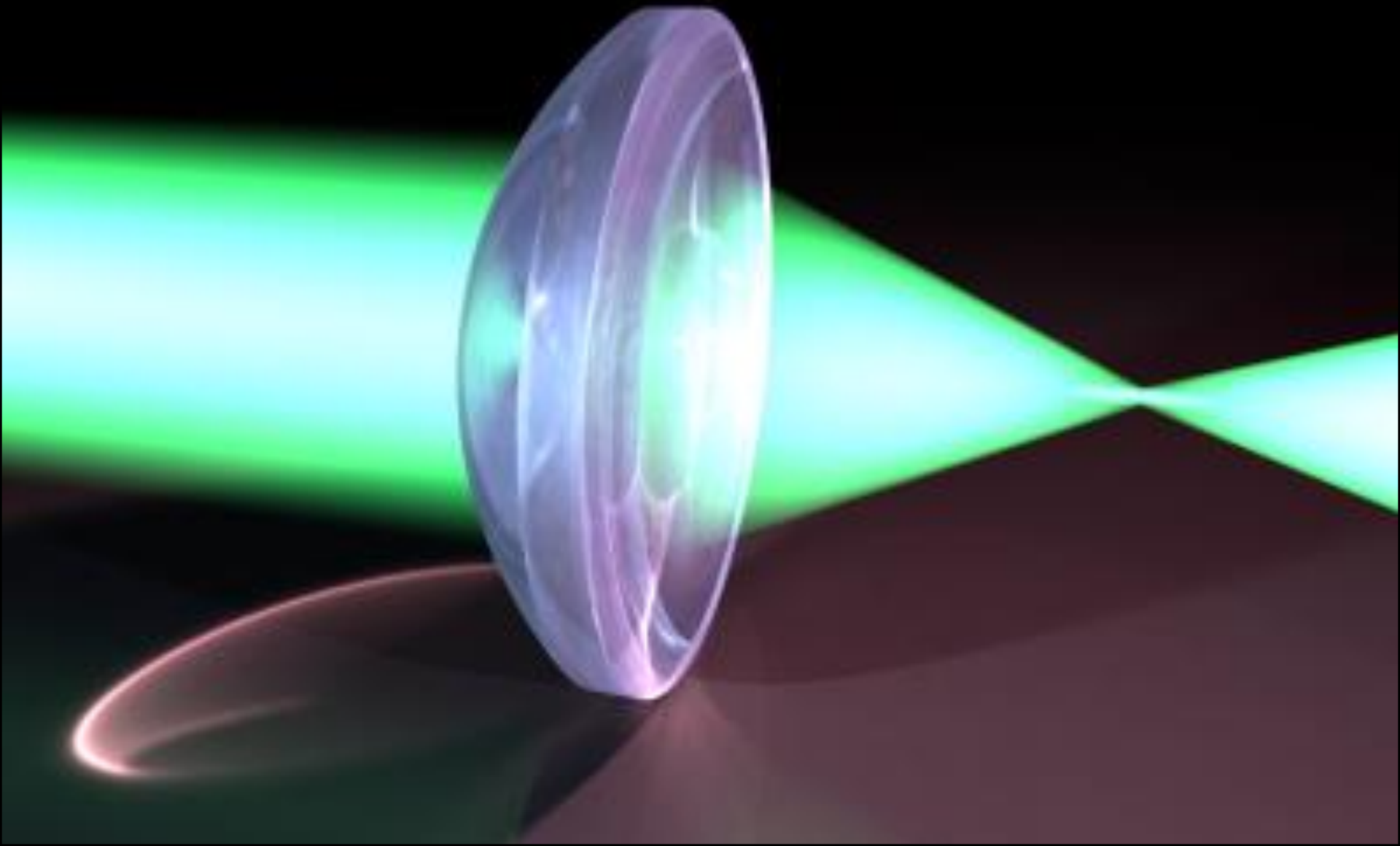


# ÓPTICA



# LENTES ESFÉRICAS





# FORMAÇÃO DE IMAGENS EM LENTES: MÉTODO GEOMÉTRICO

PROF. DANILO

[fisica.professordanilo.com](http://fisica.professordanilo.com)



# LENTEs ESFÉRICAS



# LENTES CONVERGENTES



Primeiro caso

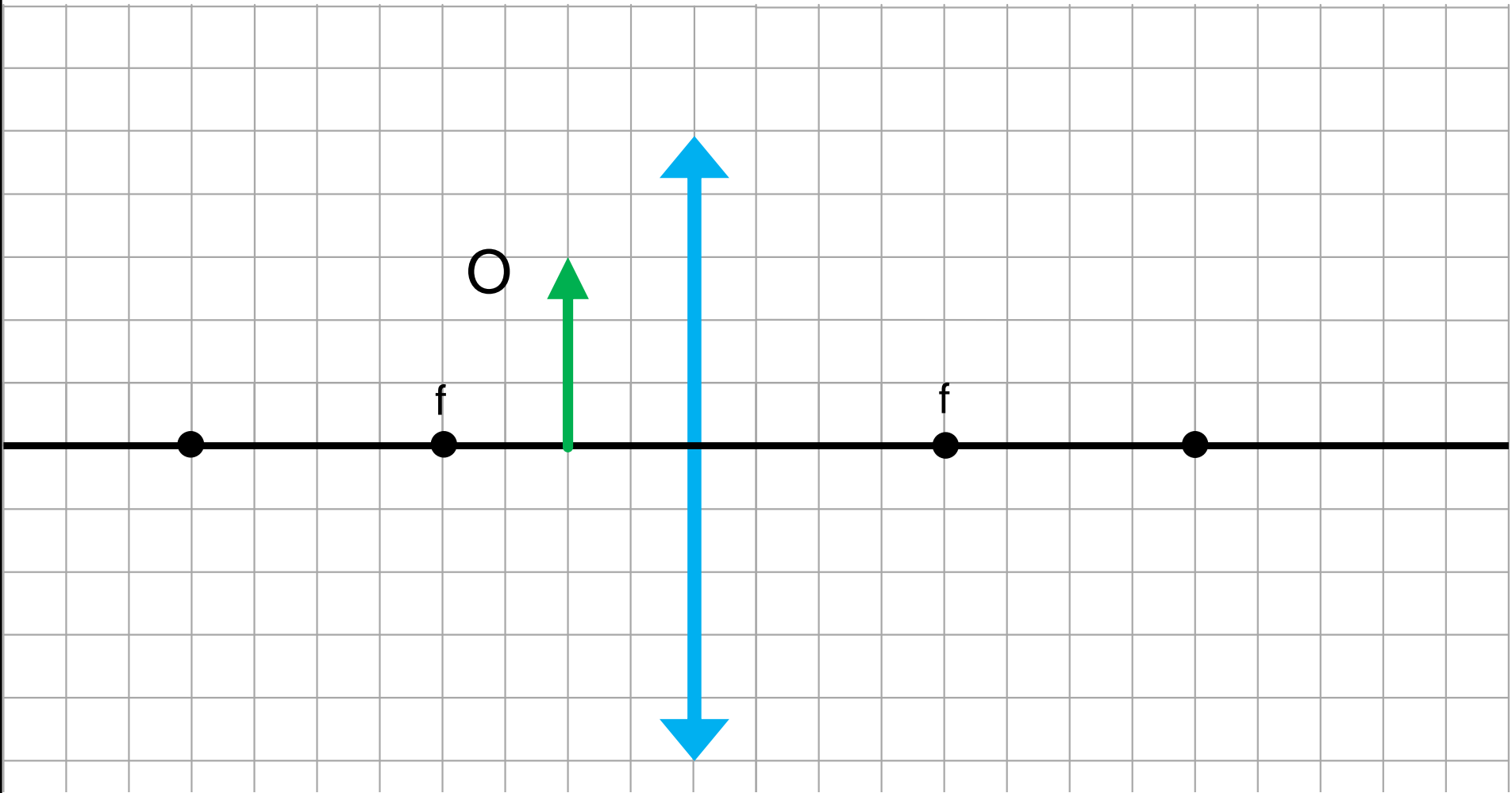


Figura 1: Objeto entre o vértice e o foco

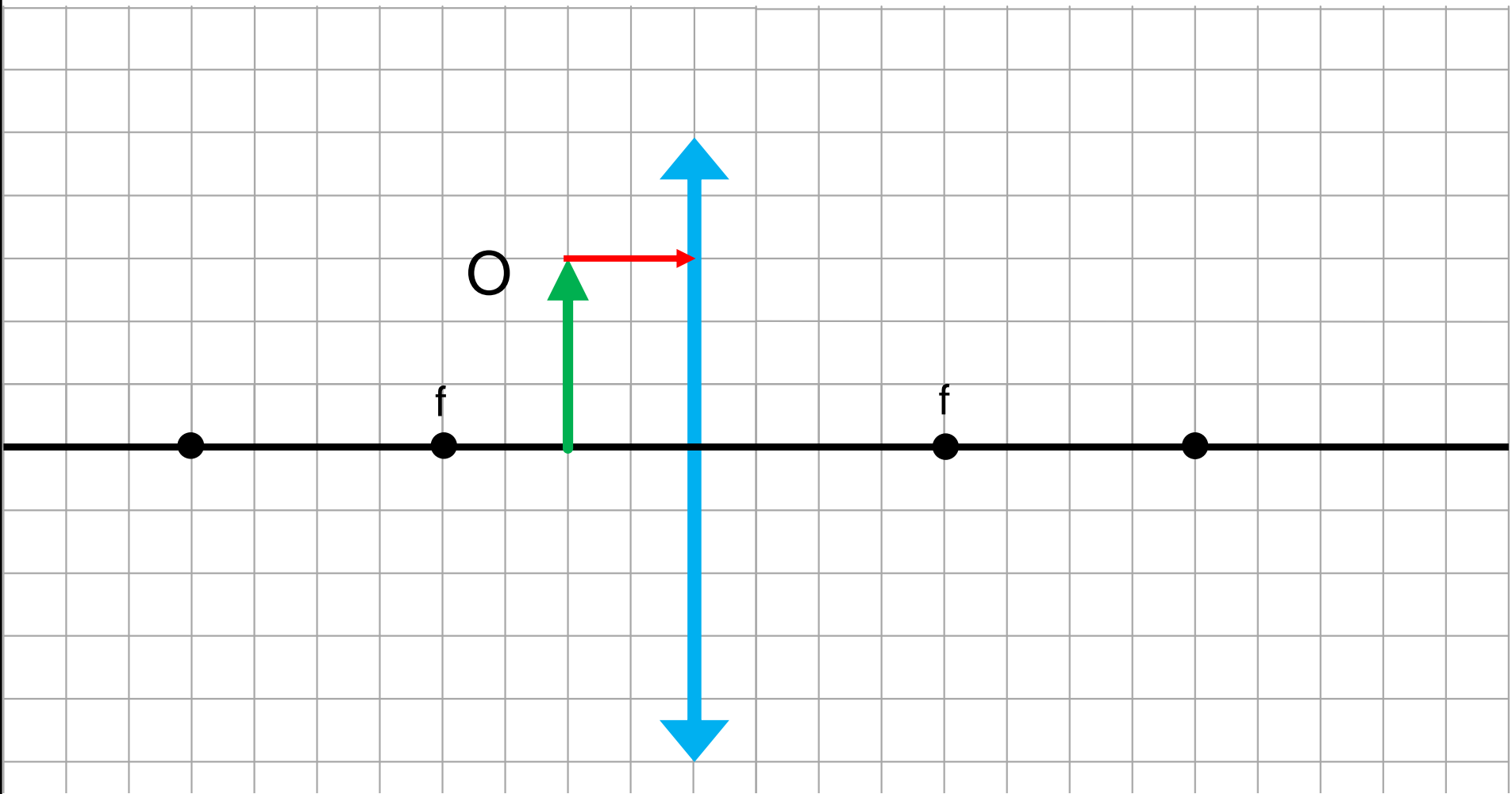


Figura 1: Objeto entre o vértice e o foco



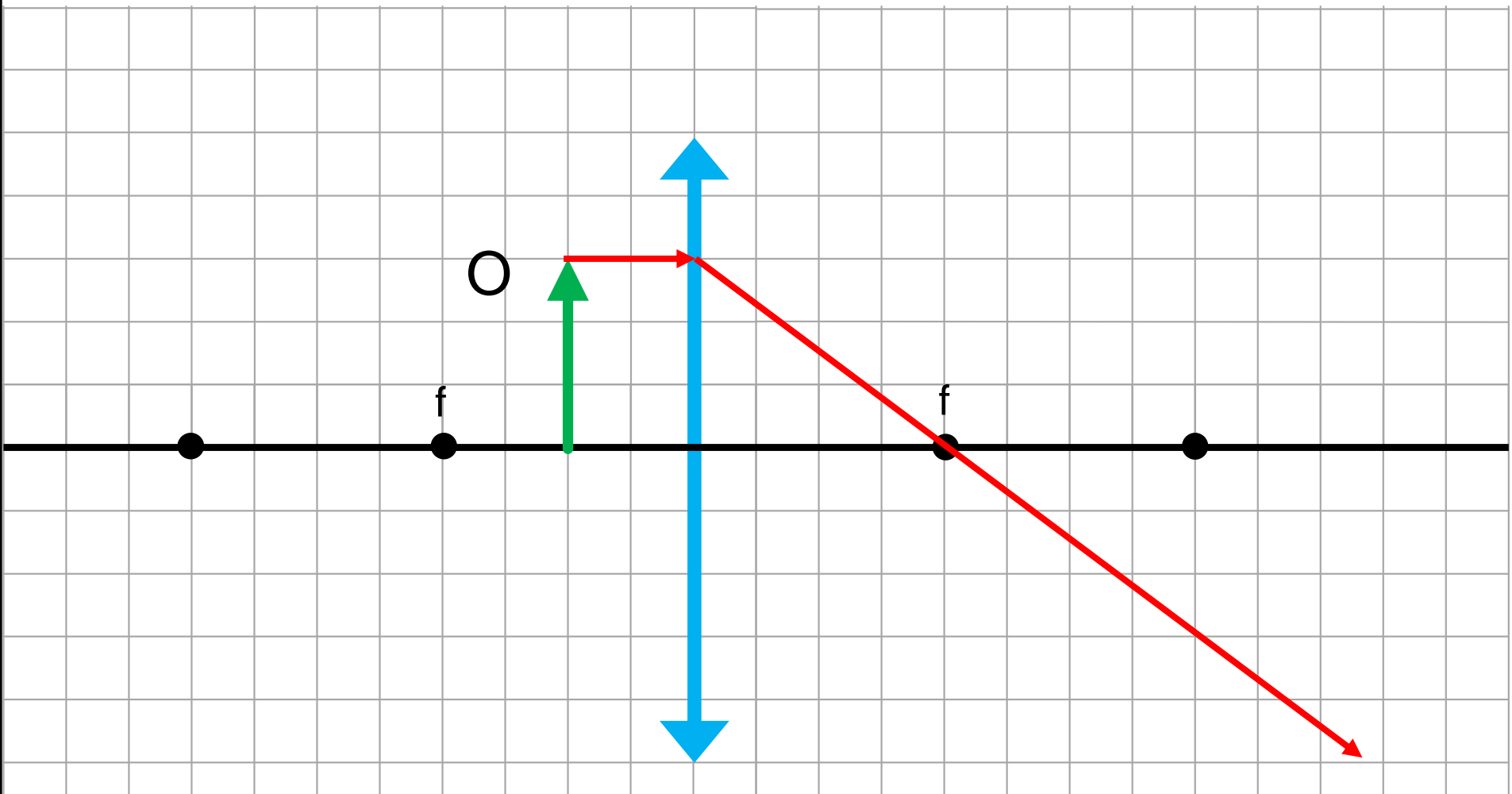


Figura 1: Objeto entre o vértice e o foco

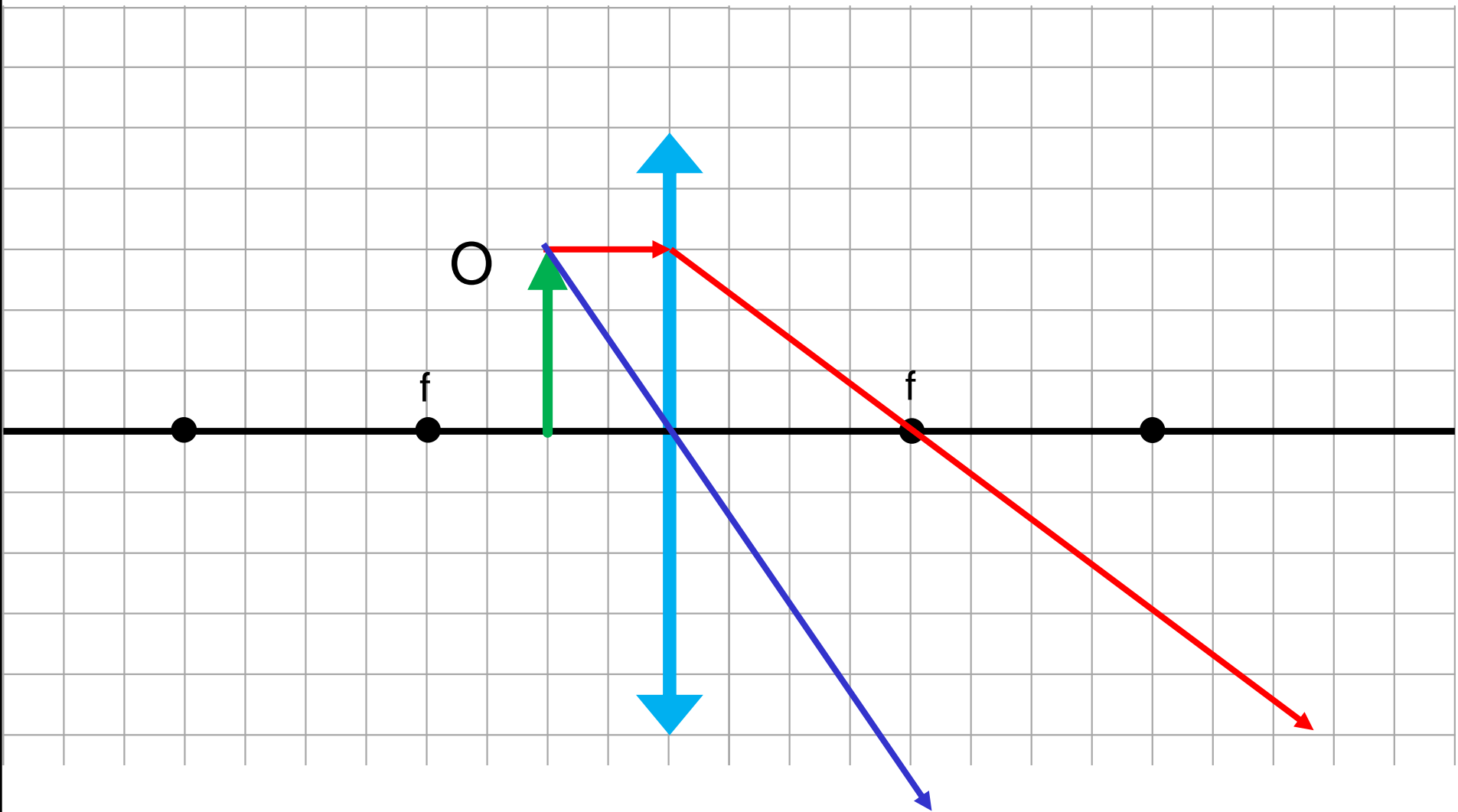


Figura 1: Objeto entre o vértice e o foco

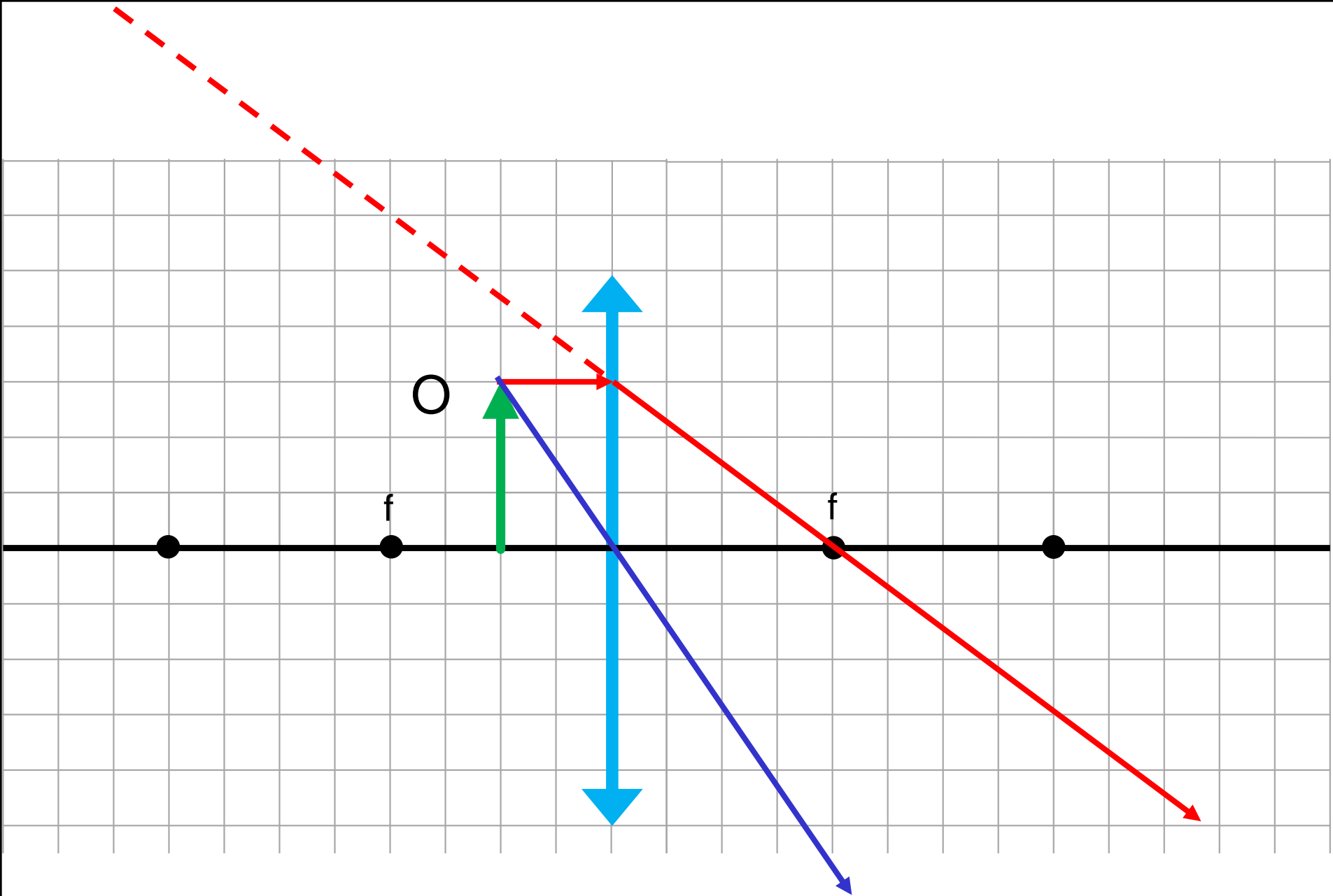


Figura 1: Objeto entre o vértice e o foco

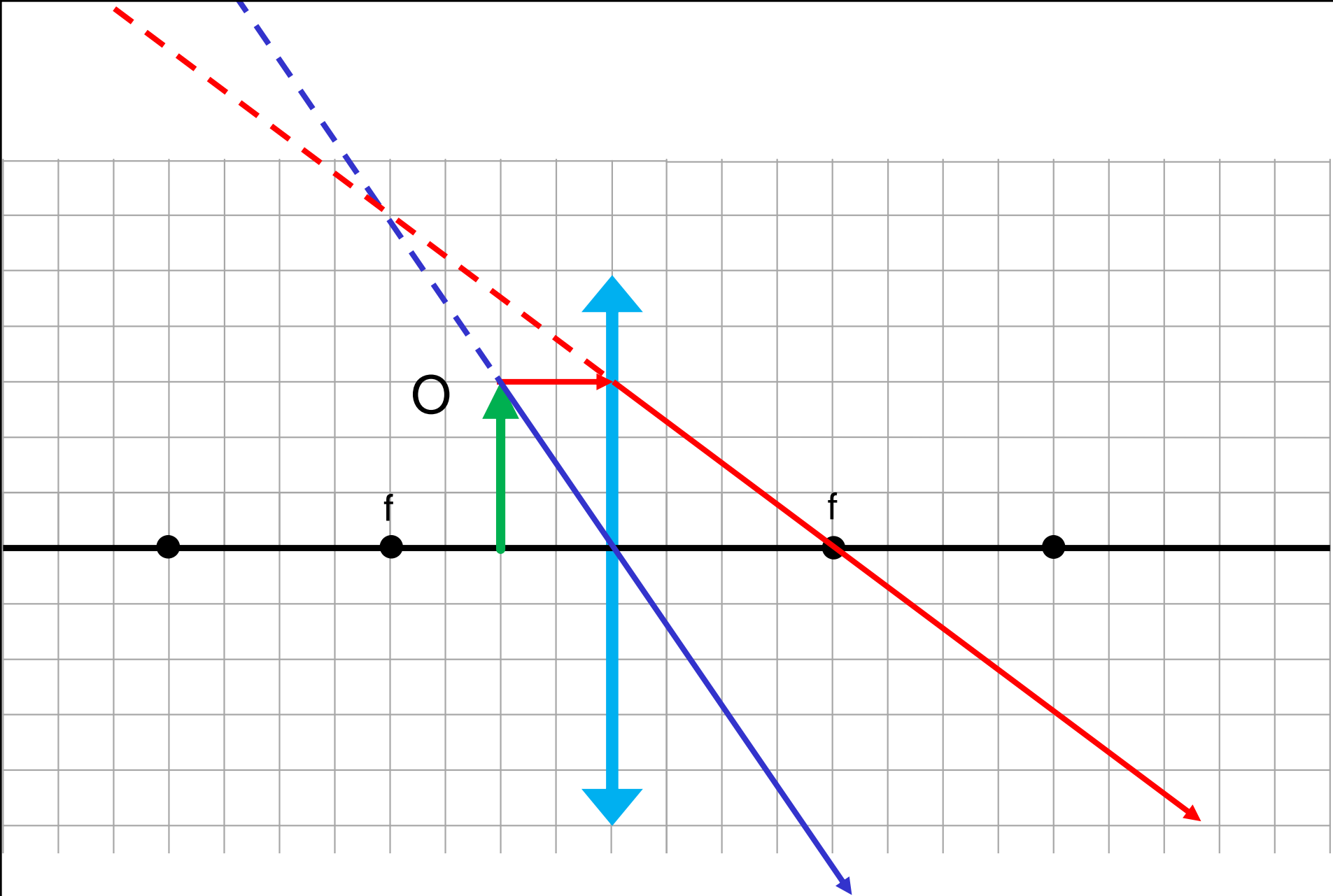


Figura 1: Objeto entre o vértice e o foco

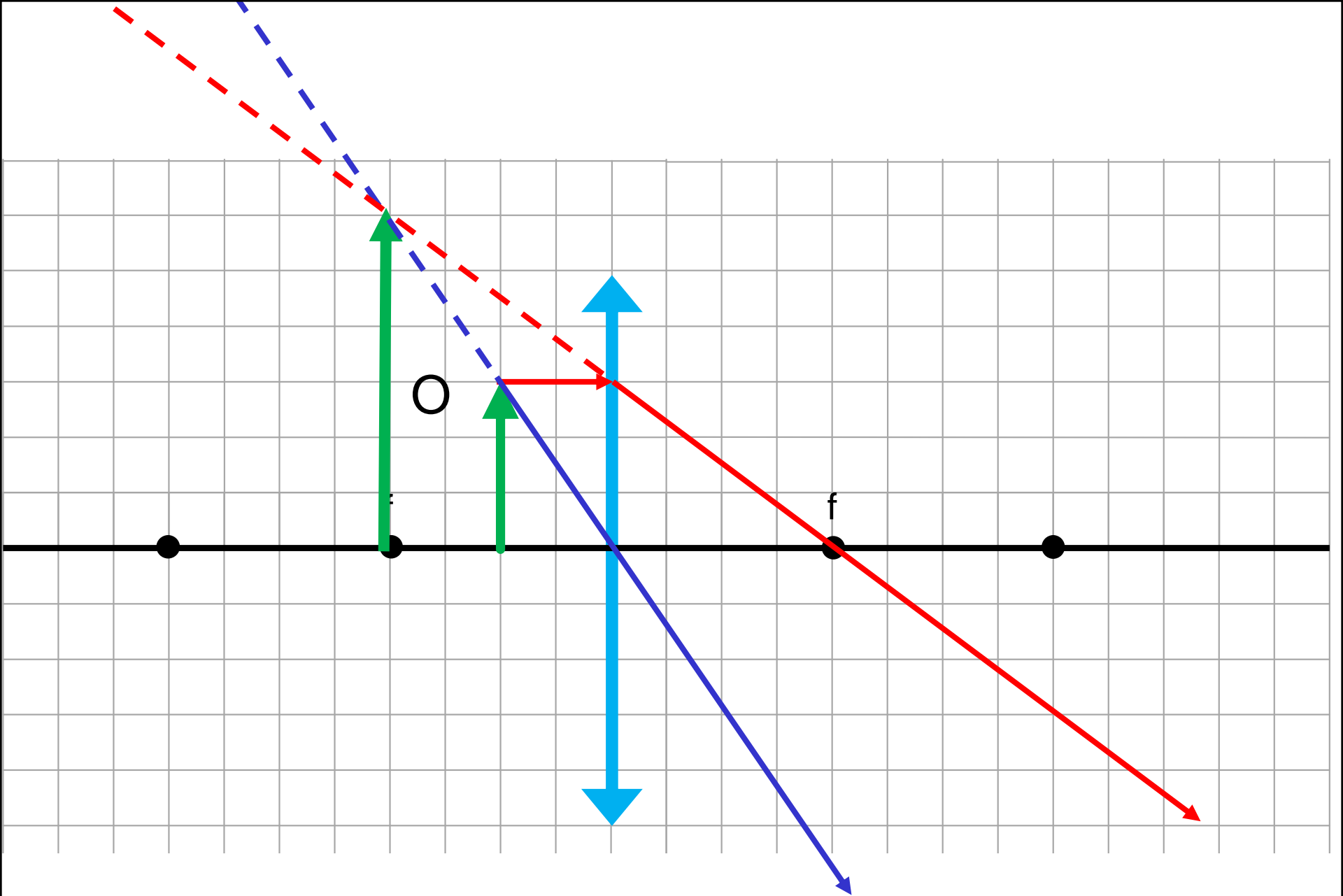


Figura 1: Objeto entre o vértice e o foco

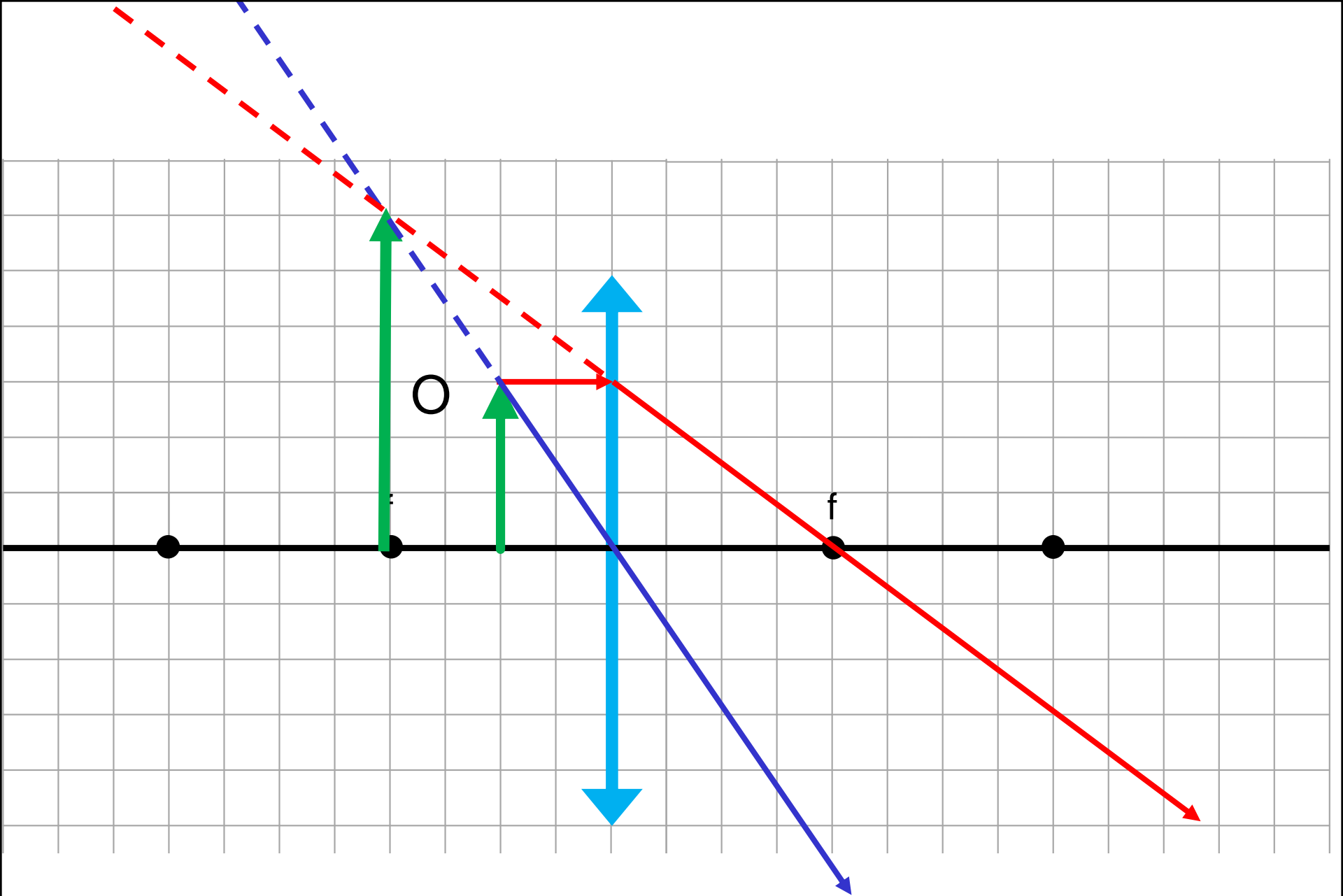


Figura 1: Objeto entre o vértice e o foco

CLASSIFICAÇÃO: Imagem VIRTUAL

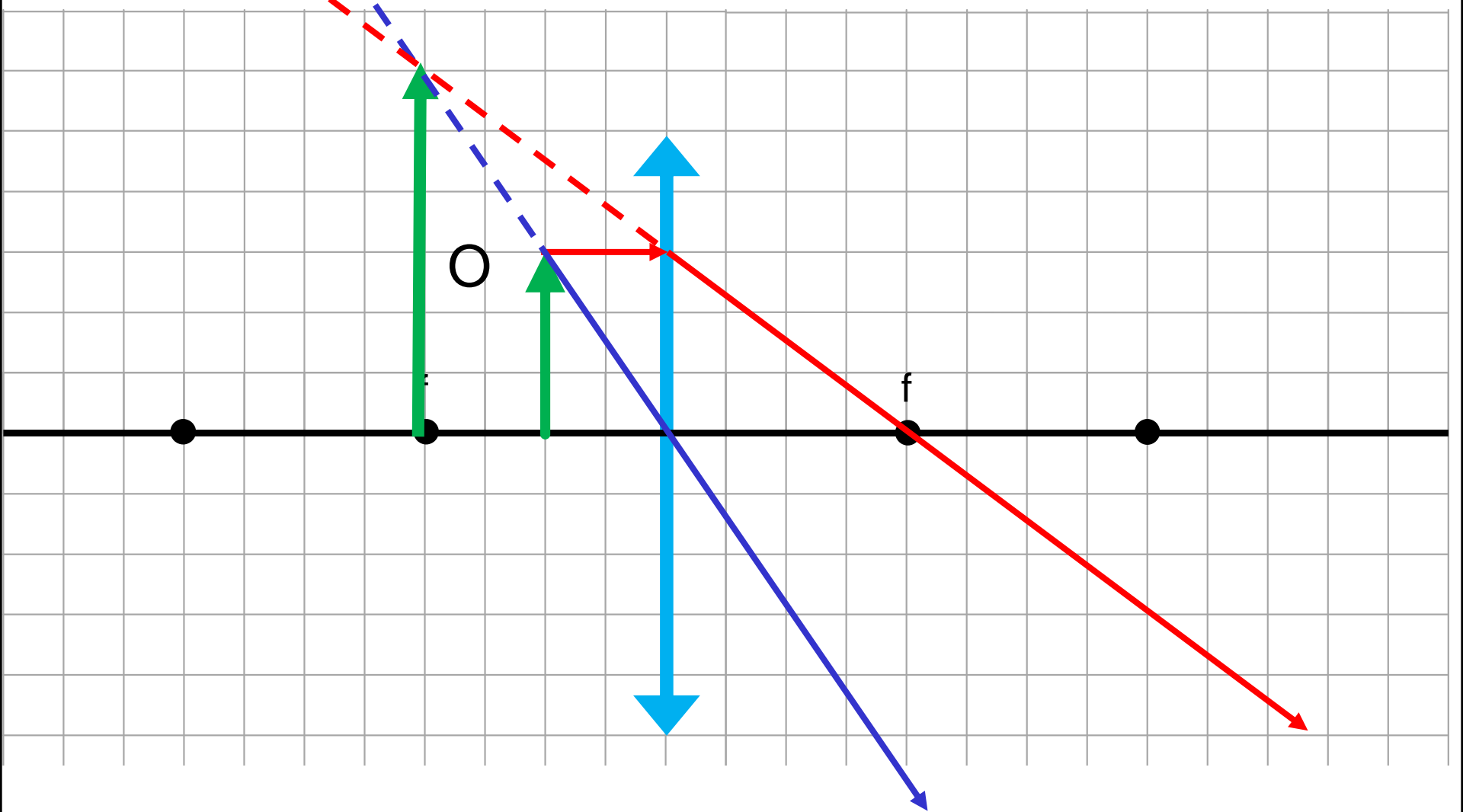


Figura 1: Objeto entre o vértice e o foco

CLASSIFICAÇÃO:

Imagem

VIRTUAL  
DIREITA

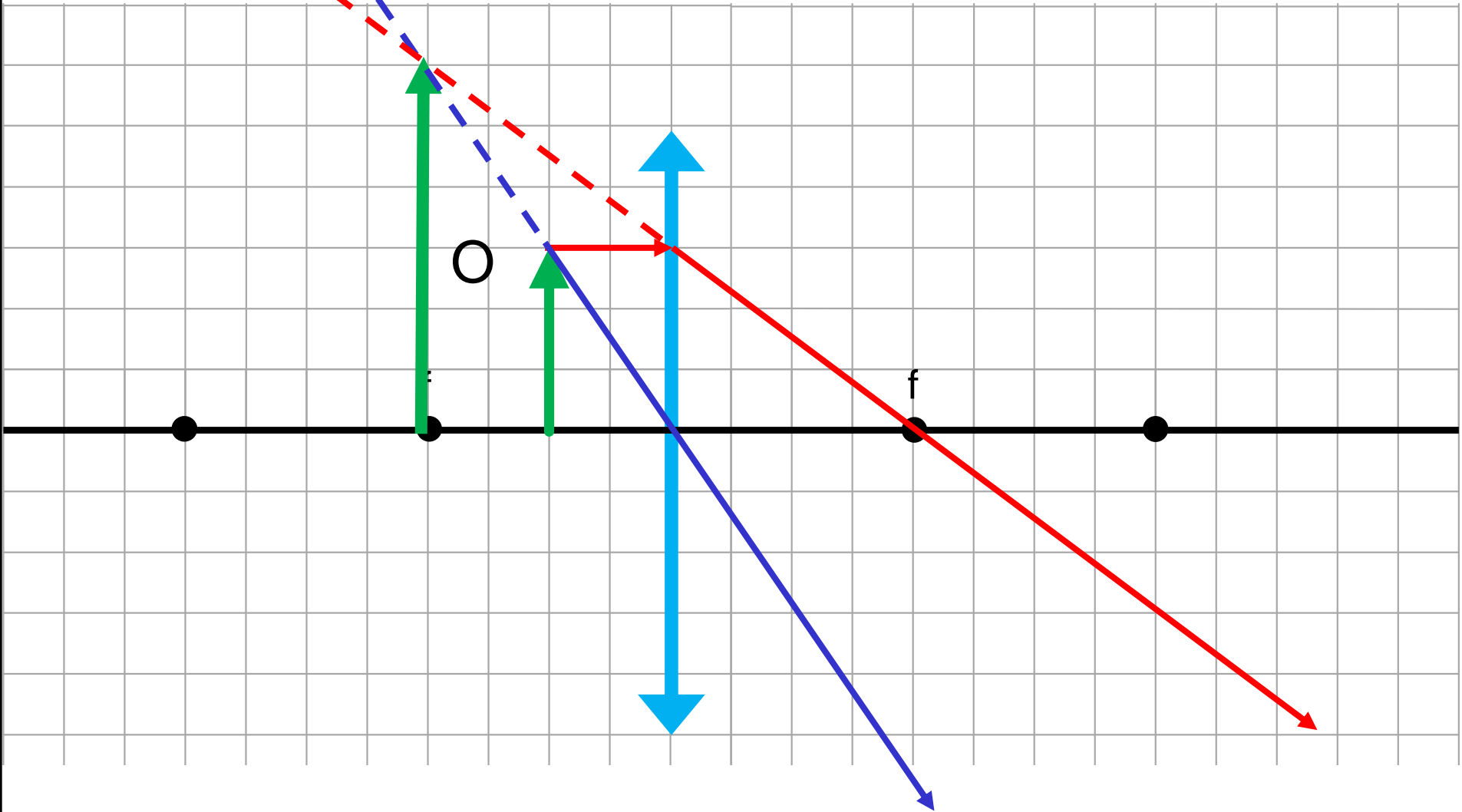


Figura 1: Objeto entre o vértice e o foco



CLASSIFICAÇÃO:

Imagem

VIRTUAL  
DIREITA  
MAIOR

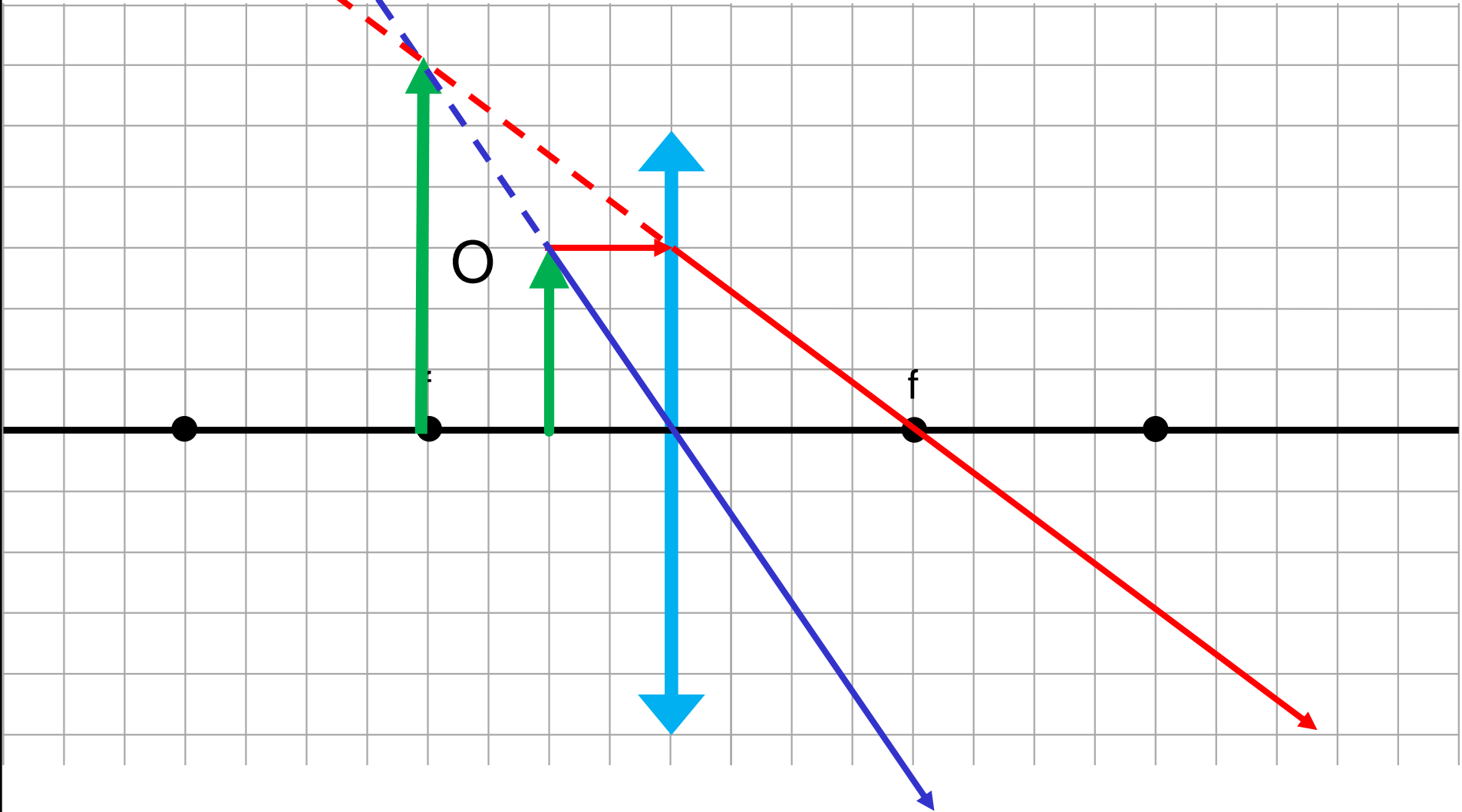


Figura 1: Objeto entre o vértice e o foco

Poderíamos utilizar algum outro raio notável?

Claro que sim. Vejamos como seria.

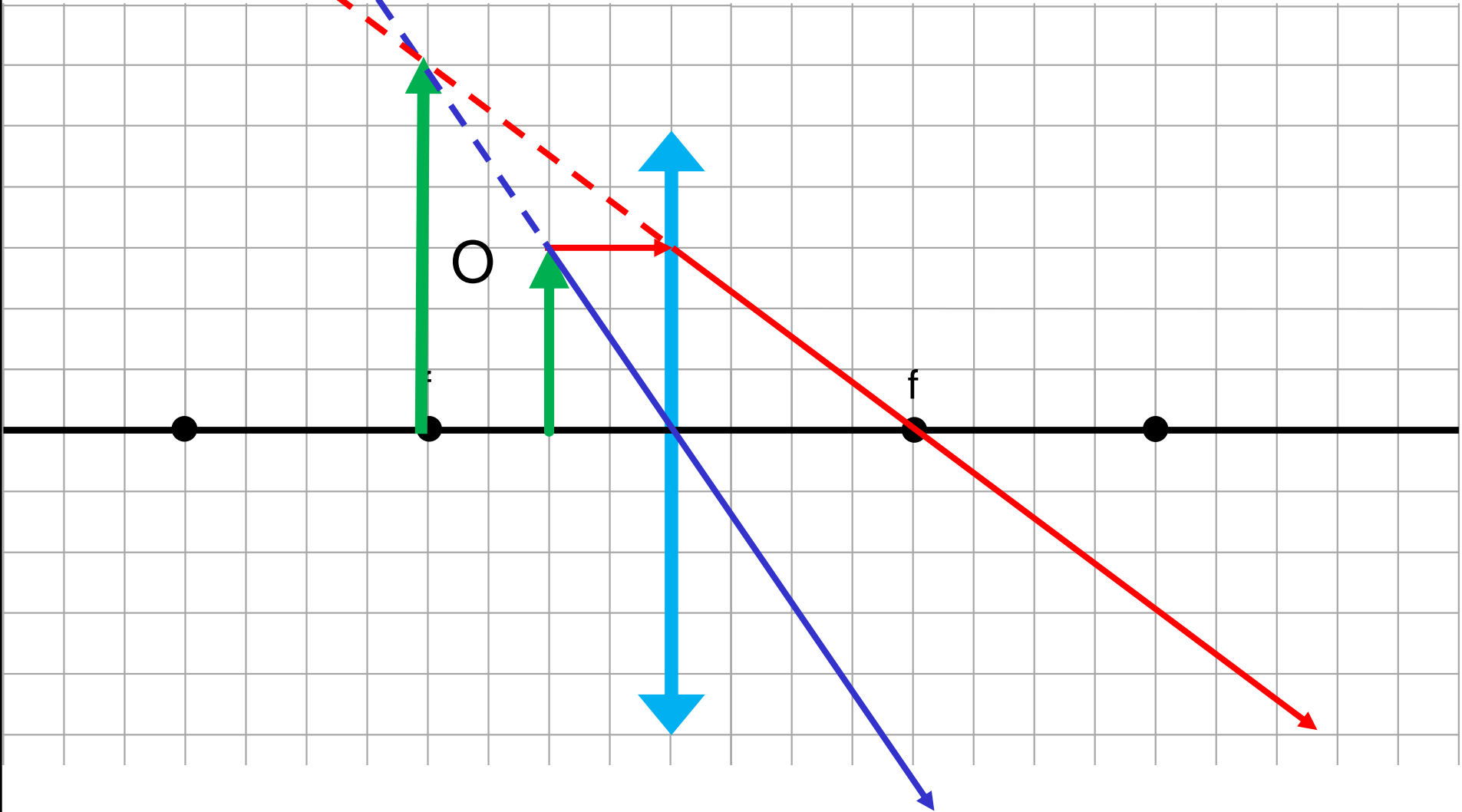


Figura 1: Objeto entre o vértice e o foco

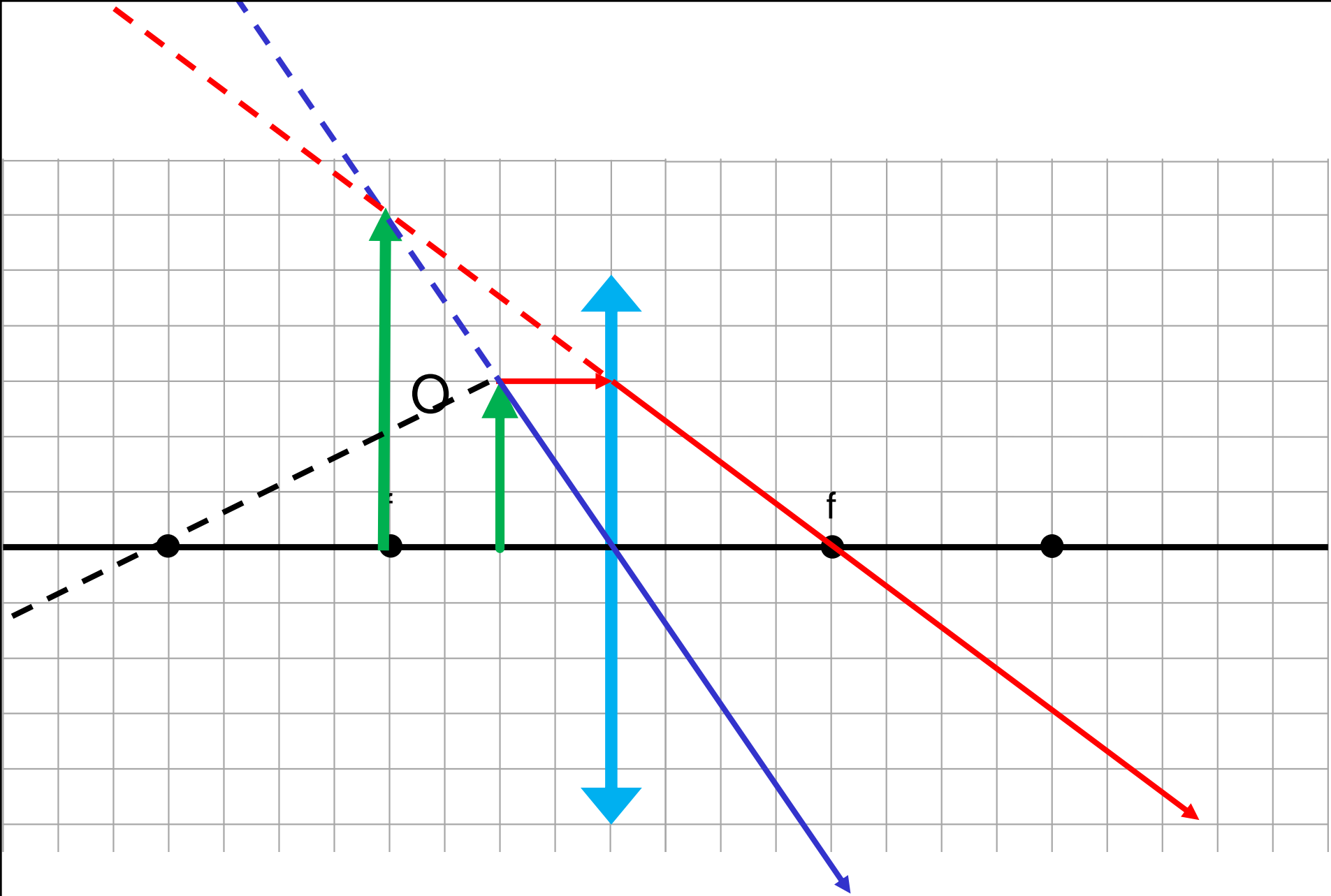


Figura 1: Objeto entre o vértice e o foco

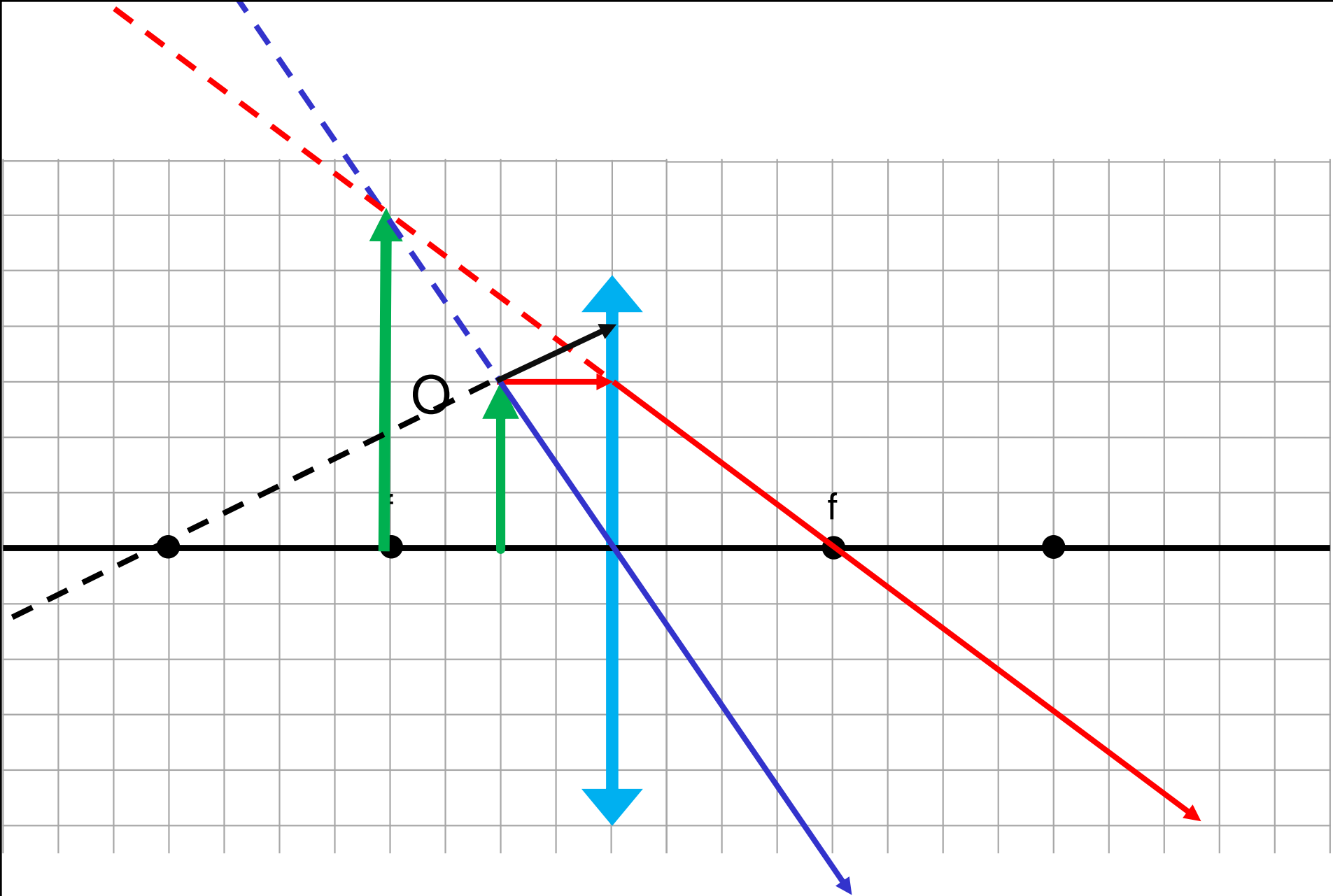


Figura 1: Objeto entre o vértice e o foco

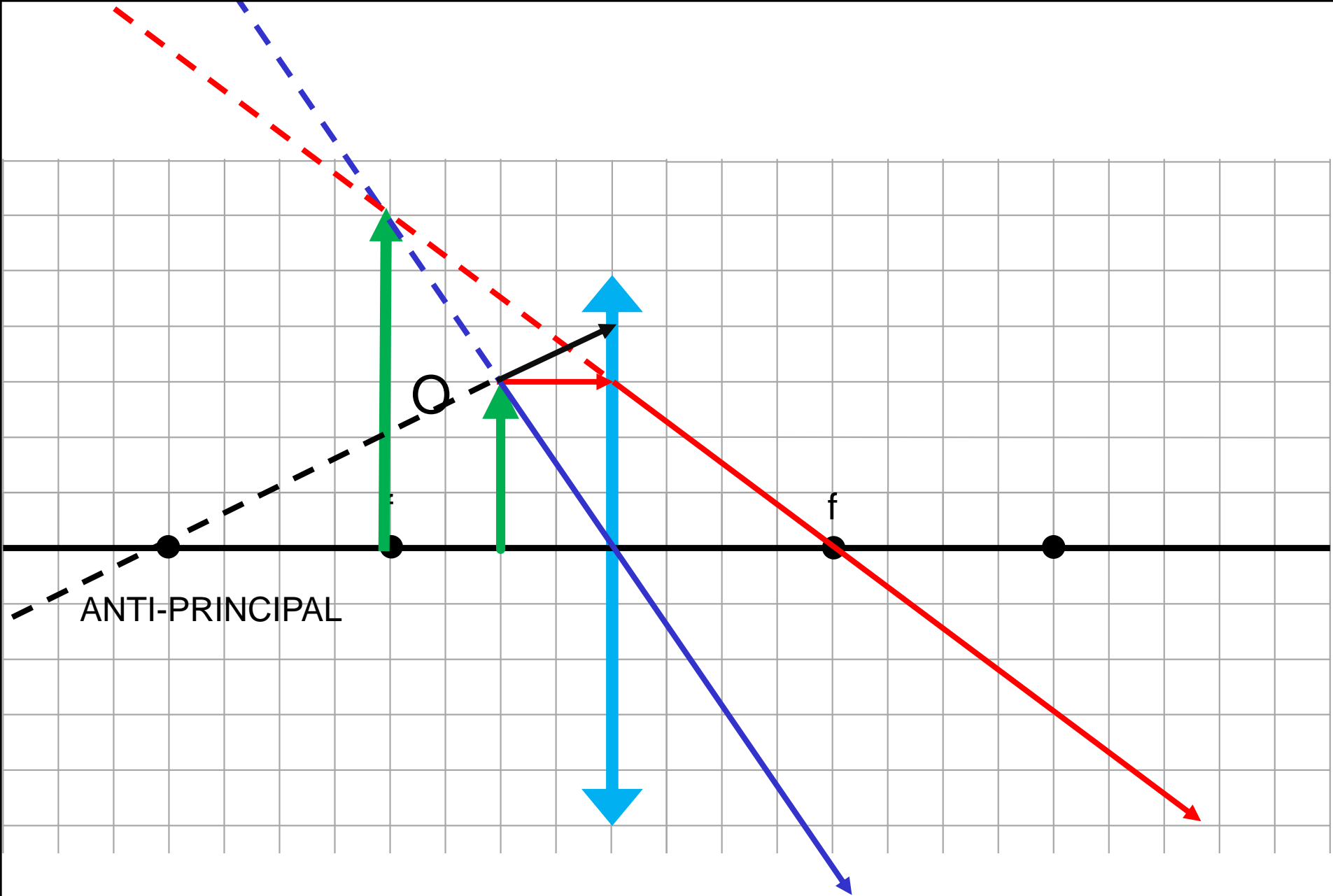


Figura 1: Objeto entre o vértice e o foco

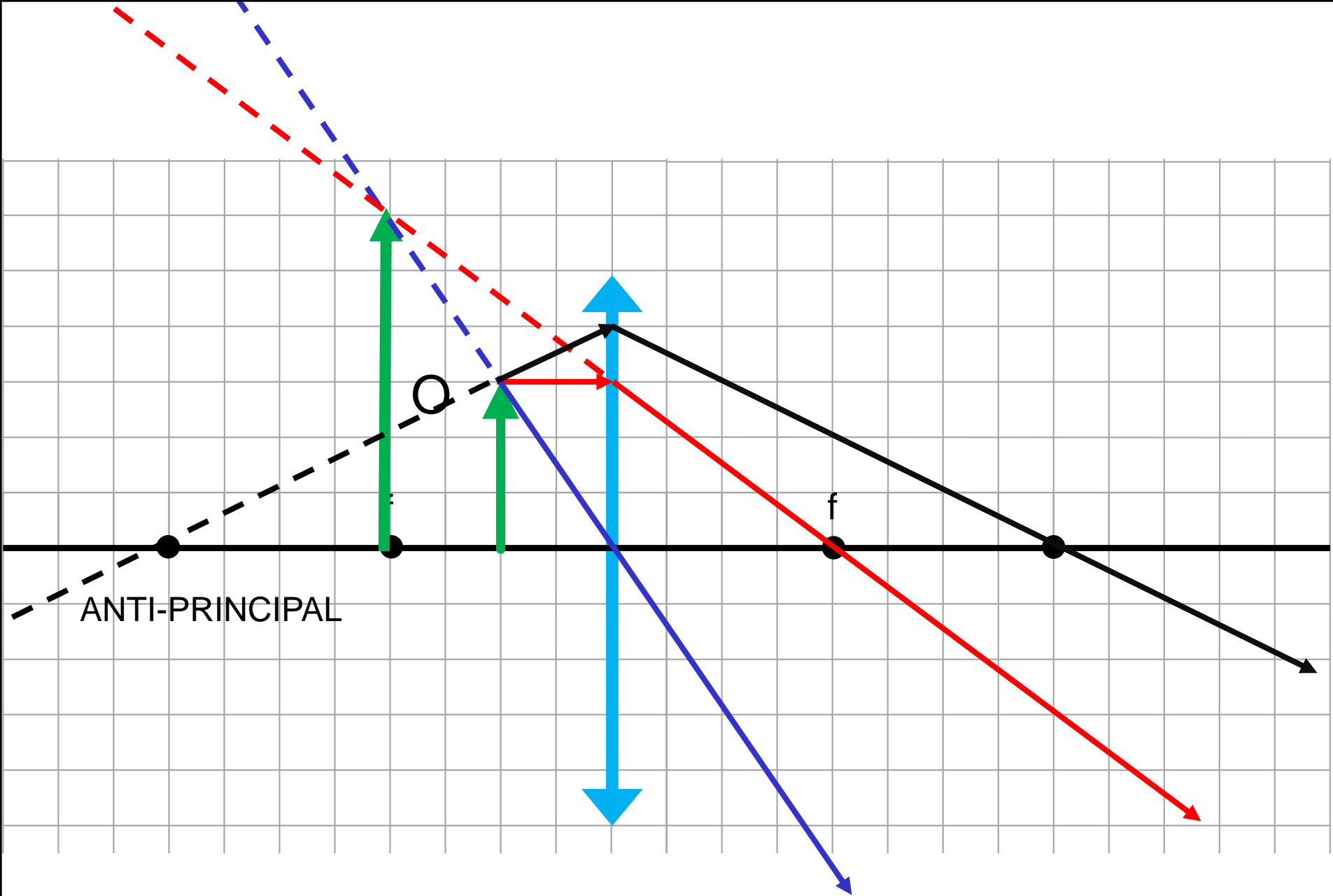


Figura 1: Objeto entre o vértice e o foco

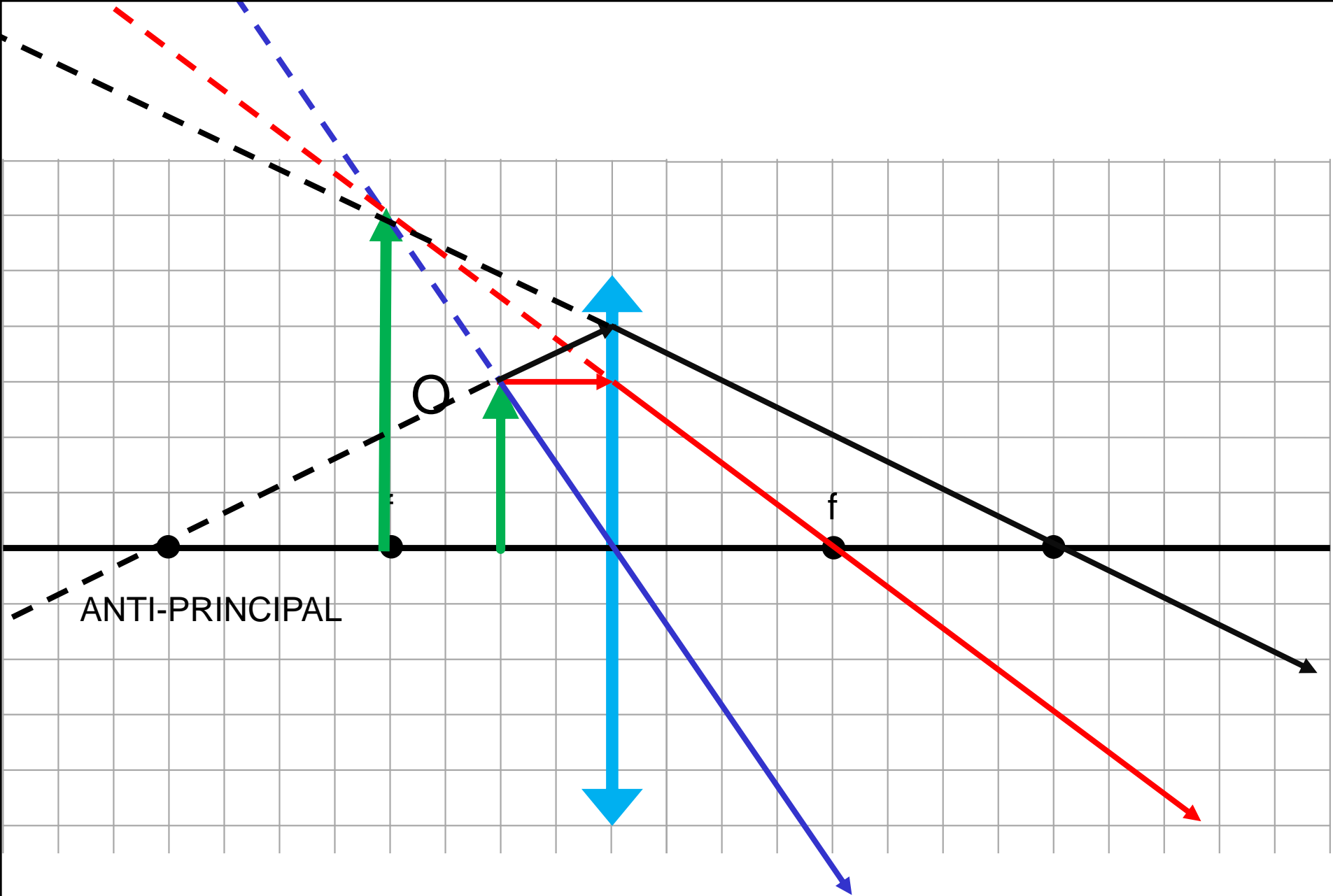


Figura 1: Objeto entre o vértice e o foco

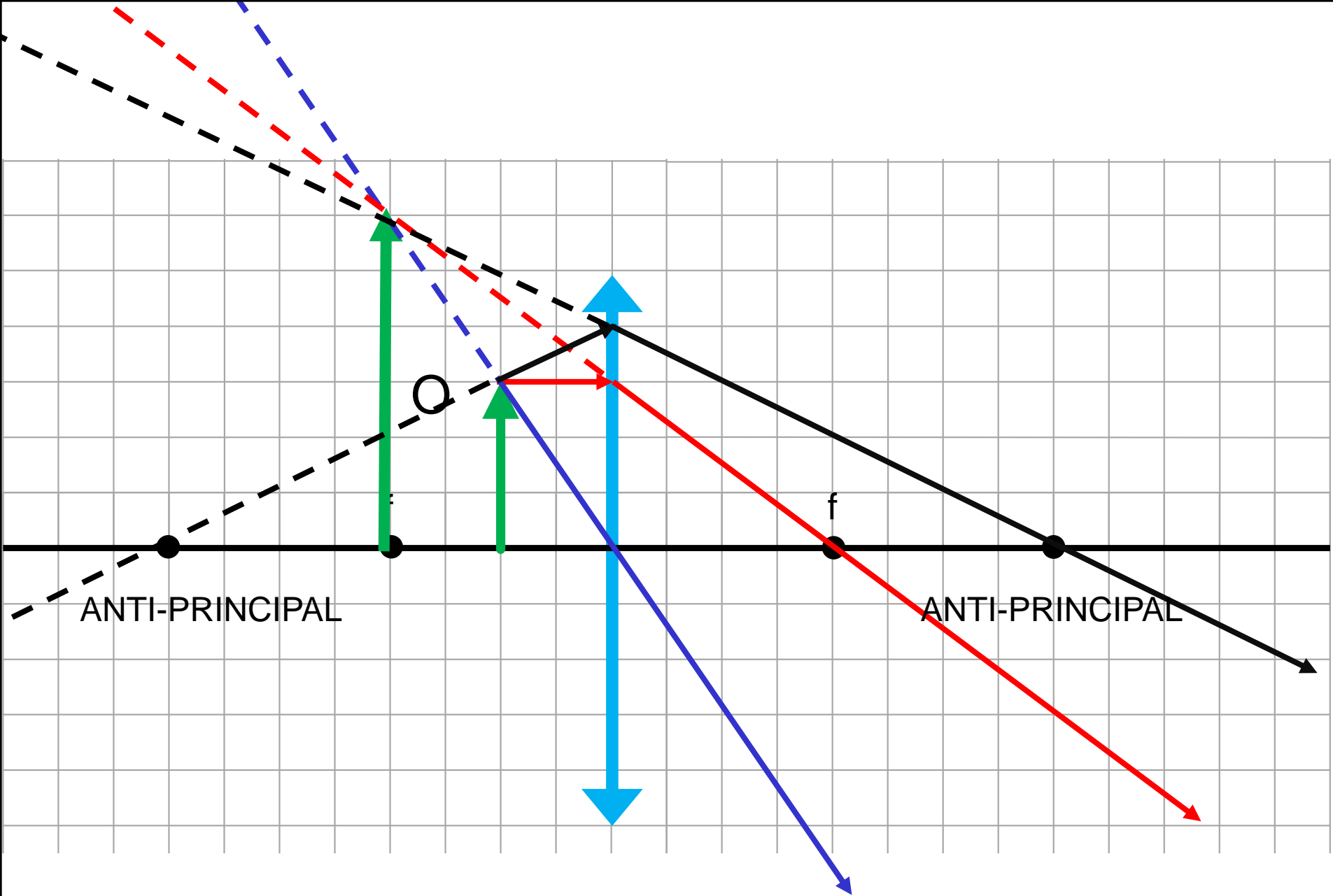


Figura 1: Objeto entre o vértice e o foco



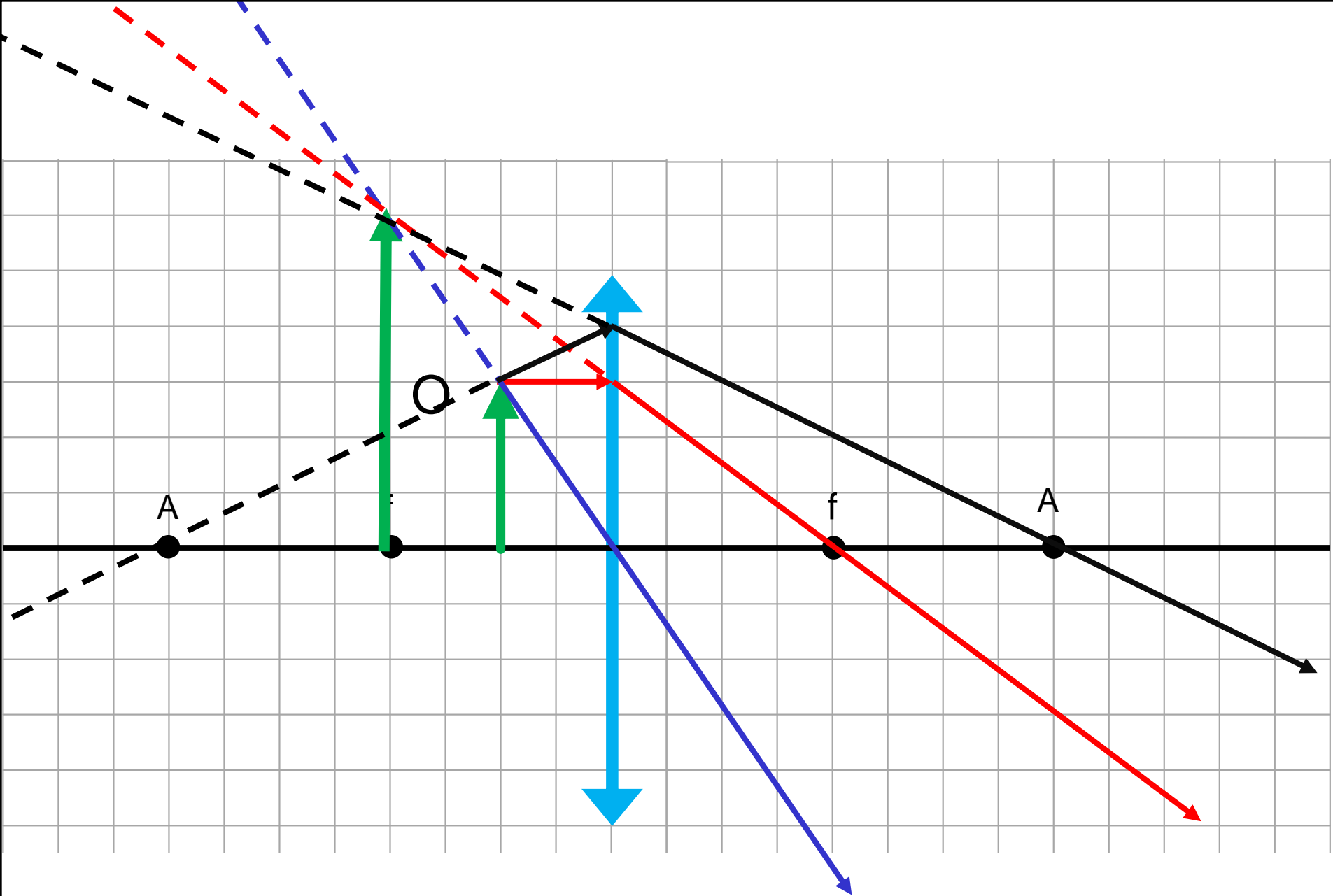


Figura 1: Objeto entre o vértice e o foco



# Segundo caso

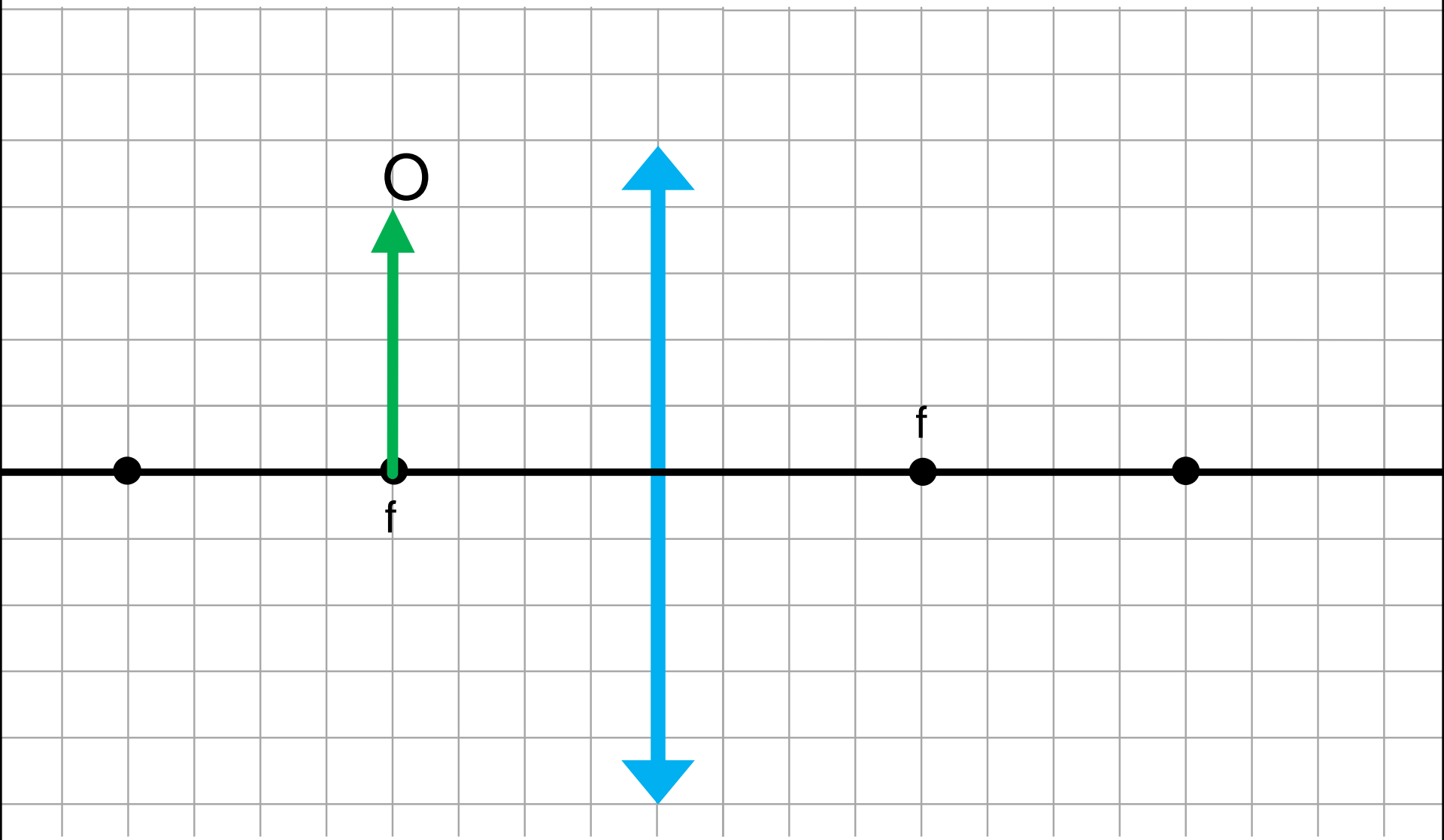


Figura 2: Objeto no foco

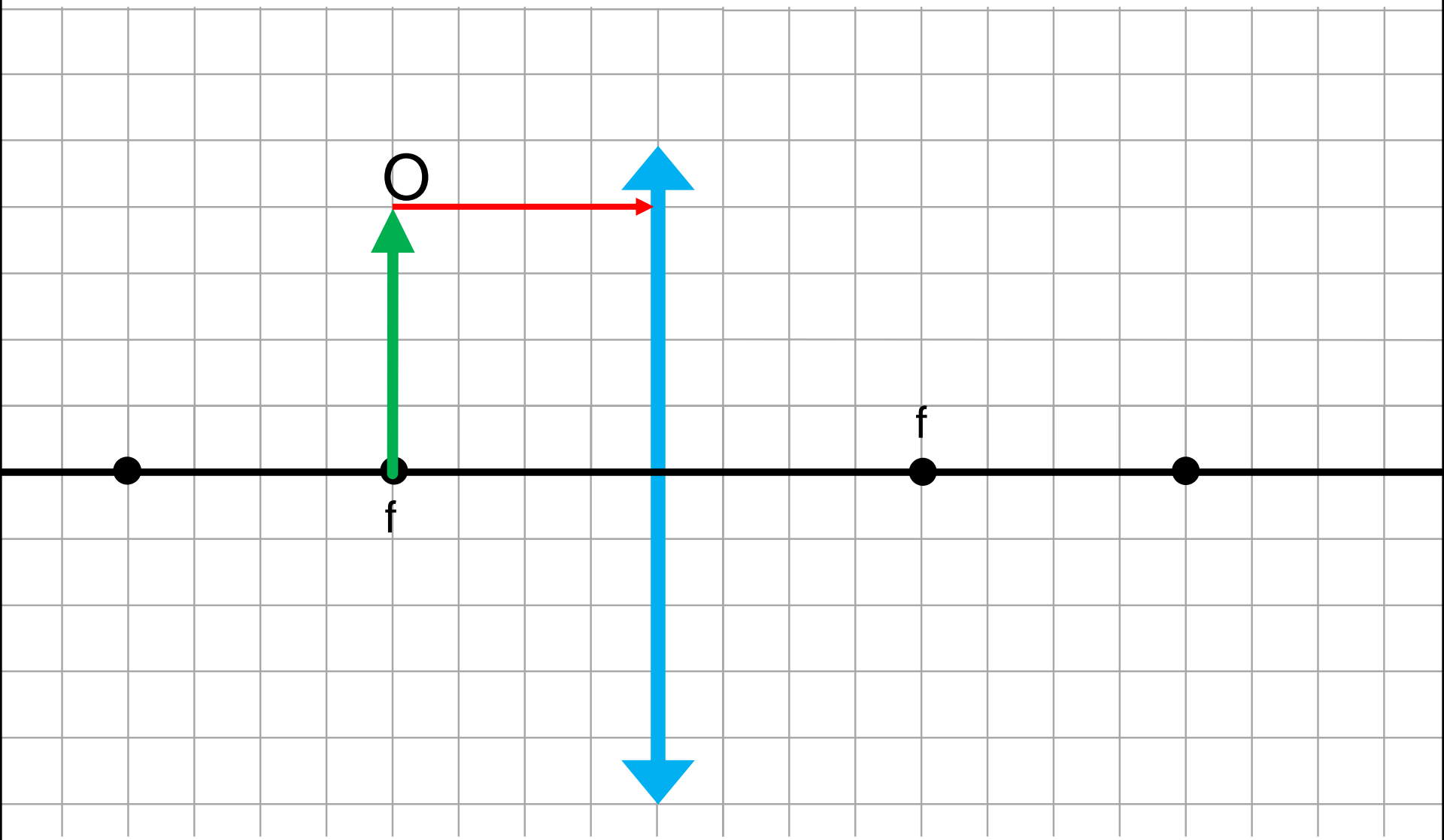


Figura 2: Objeto no foco

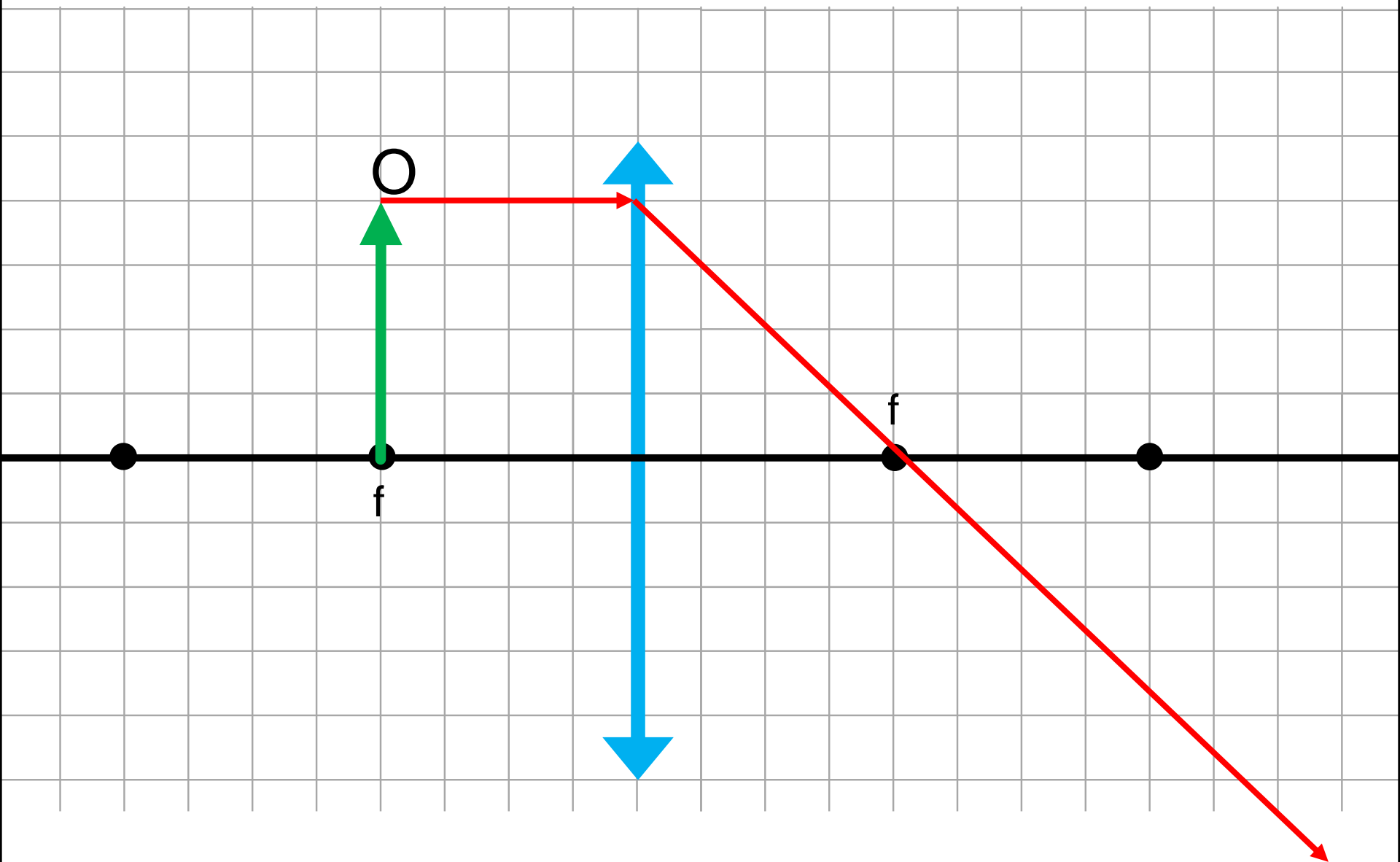


Figura 2: Objeto no foco

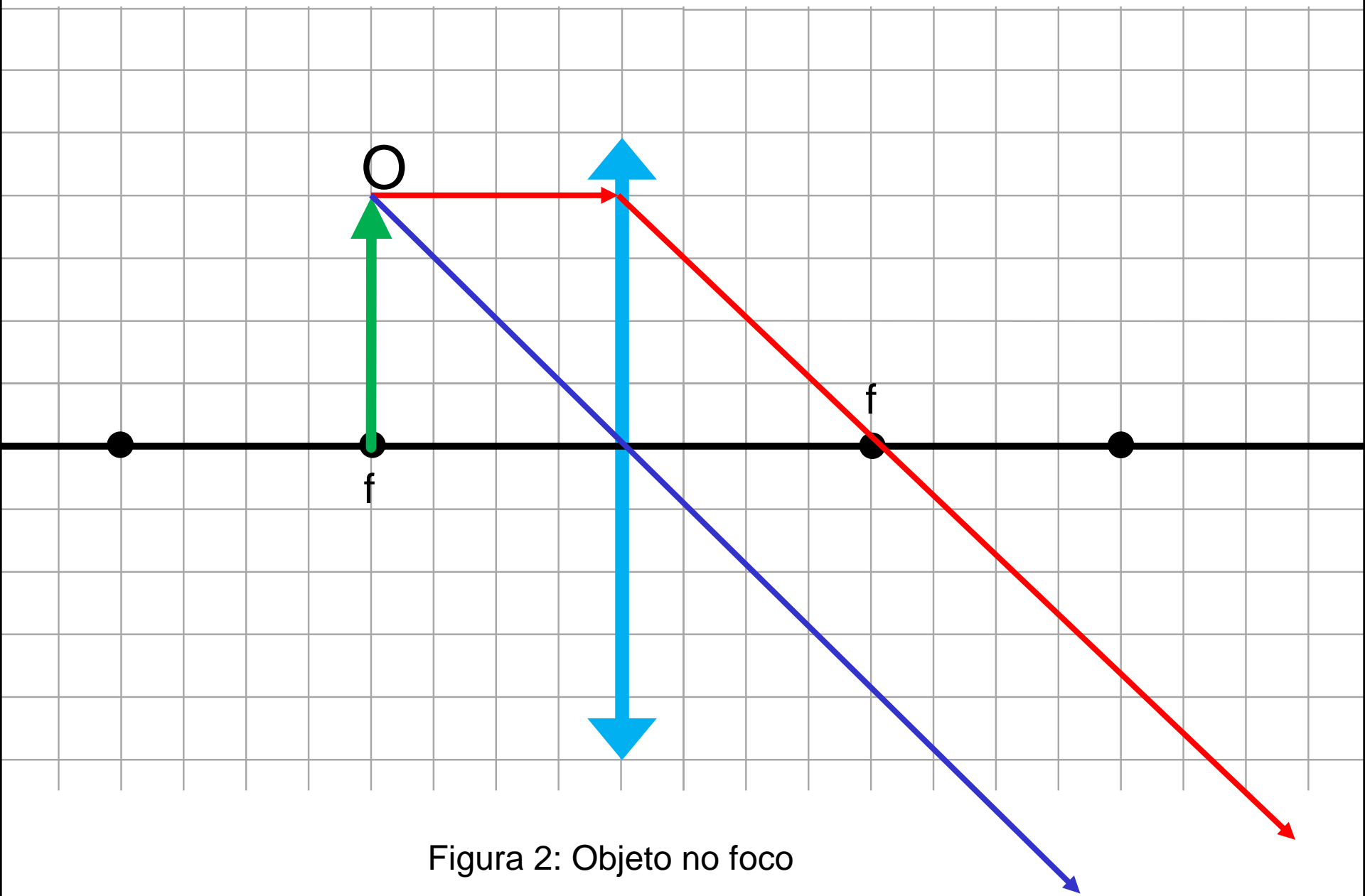


Figura 2: Objeto no foco

# IMAGEM IMPRÓPRIA

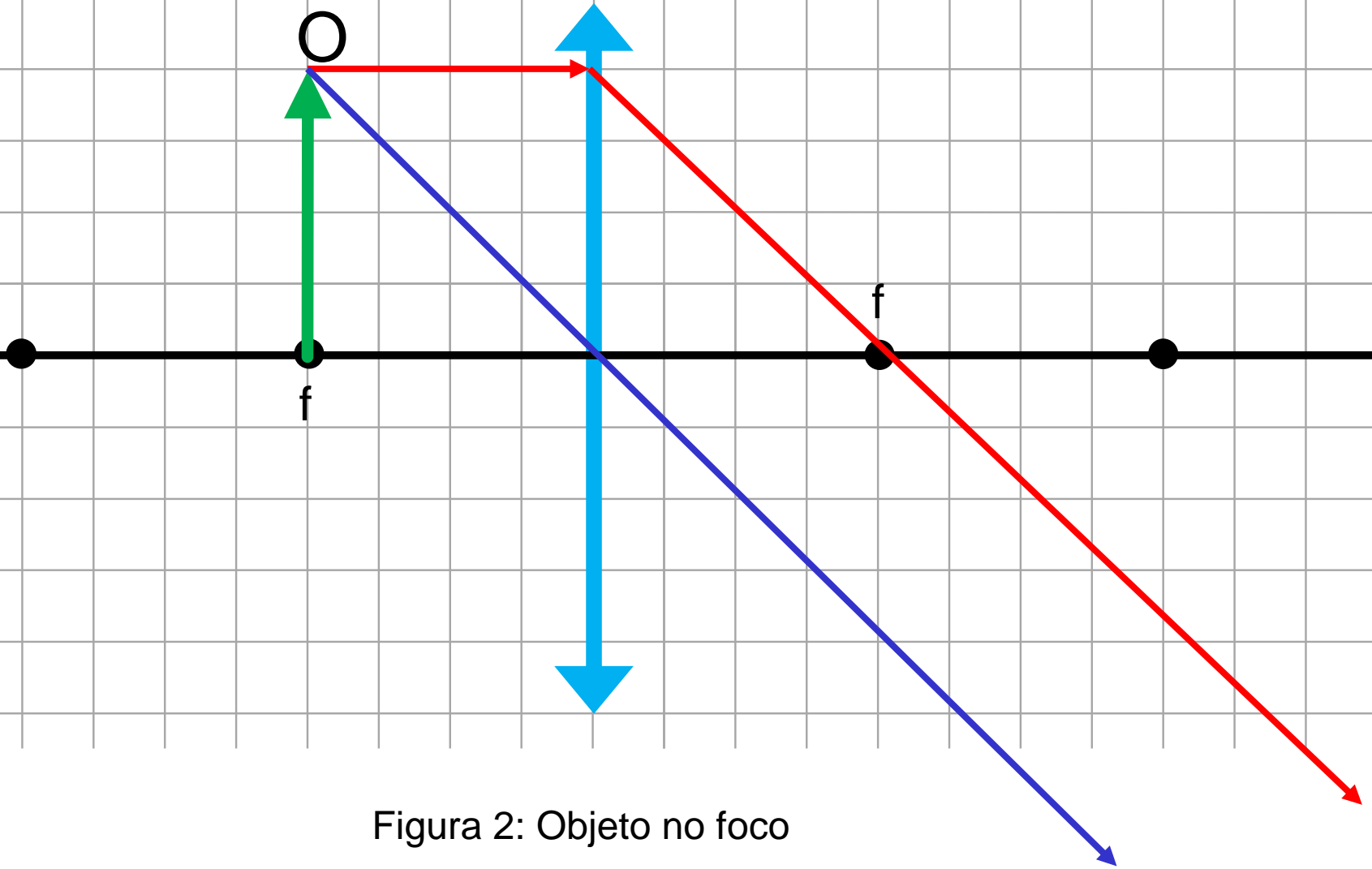


Figura 2: Objeto no foco



Terceiro caso



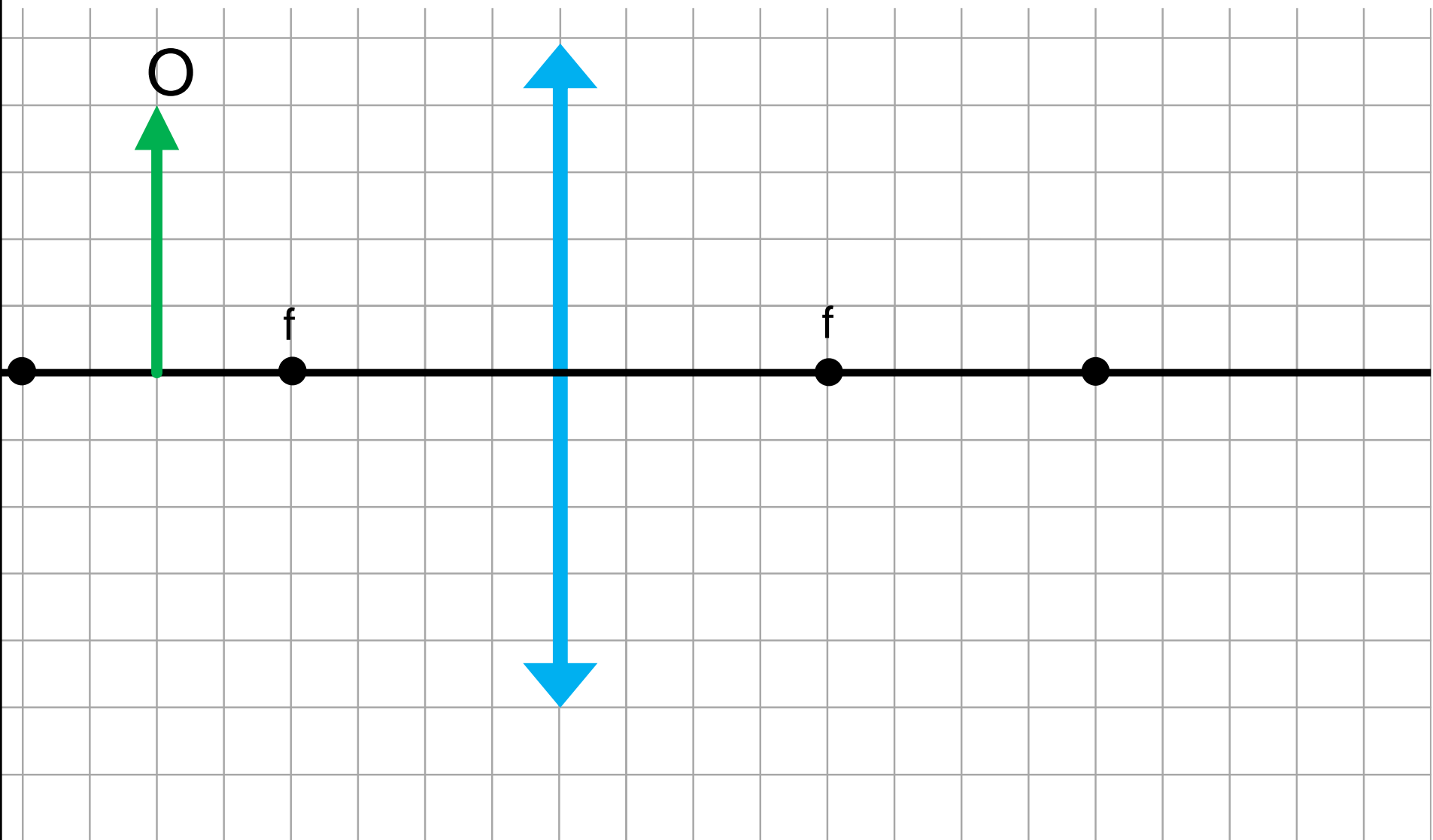


Figura 3: Objeto entre o foco e o anti-principal

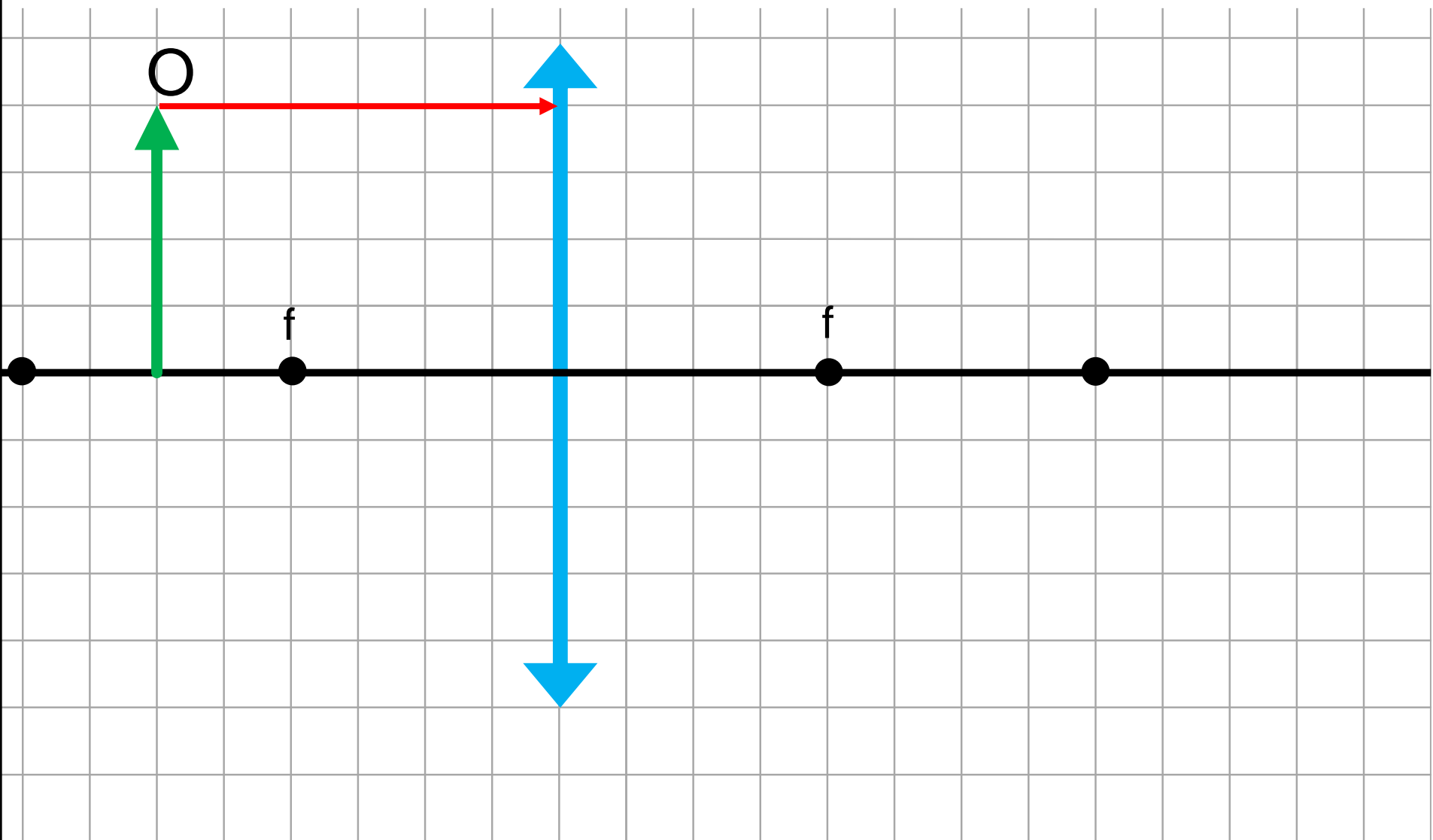


Figura 3: Objeto entre o foco e o anti-principal

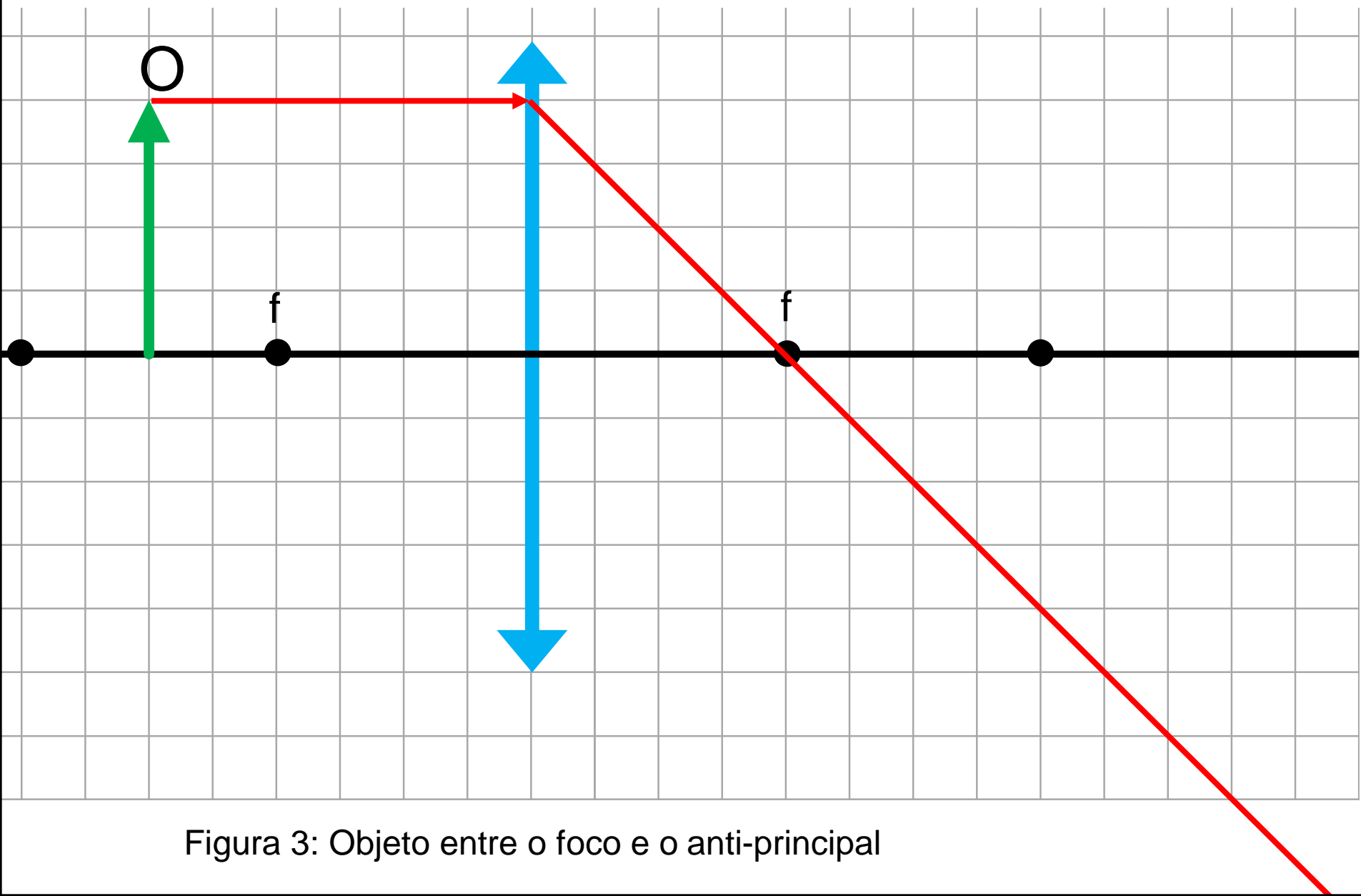


Figura 3: Objeto entre o foco e o anti-principal

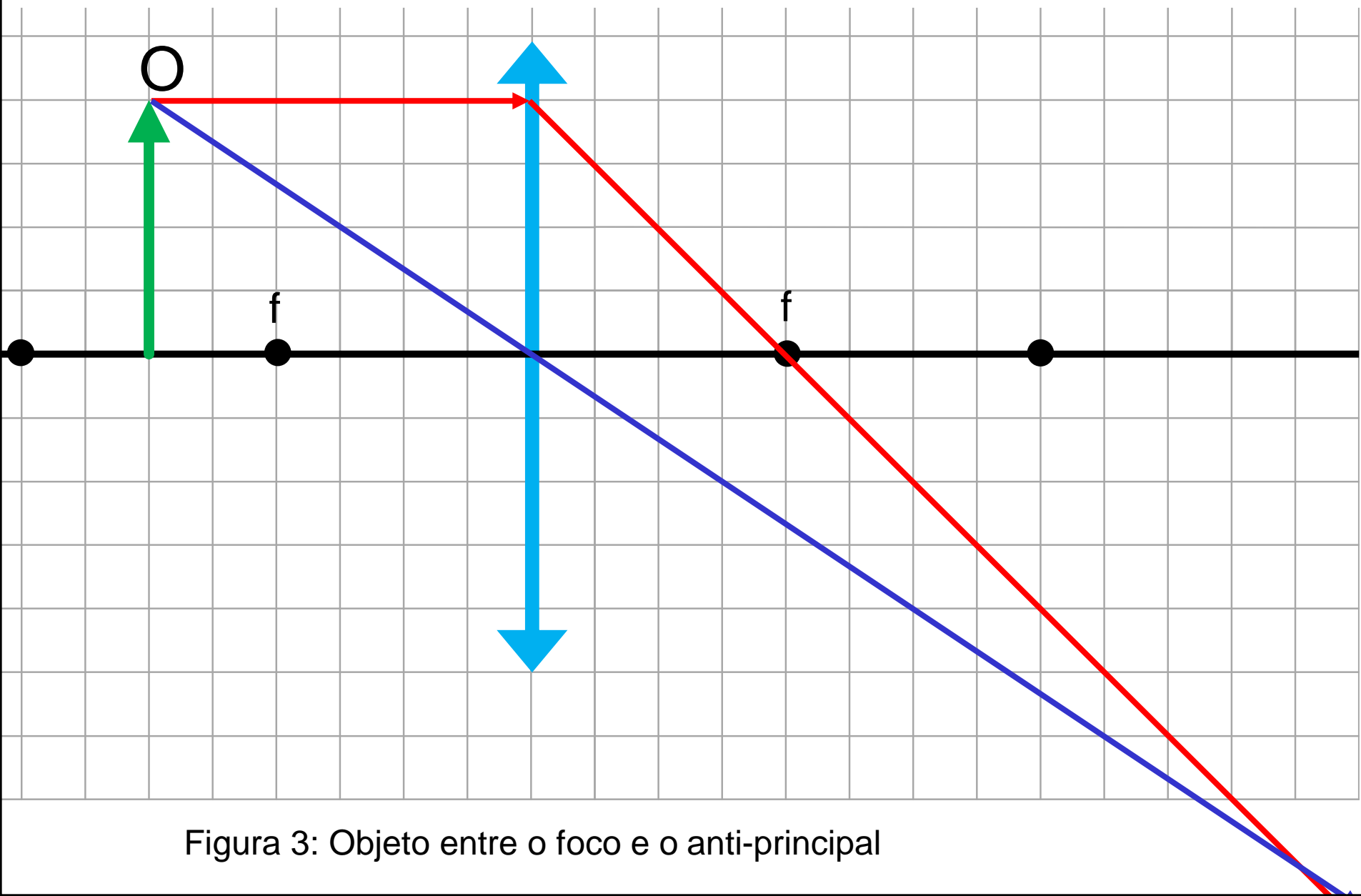


Figura 3: Objeto entre o foco e o anti-principal

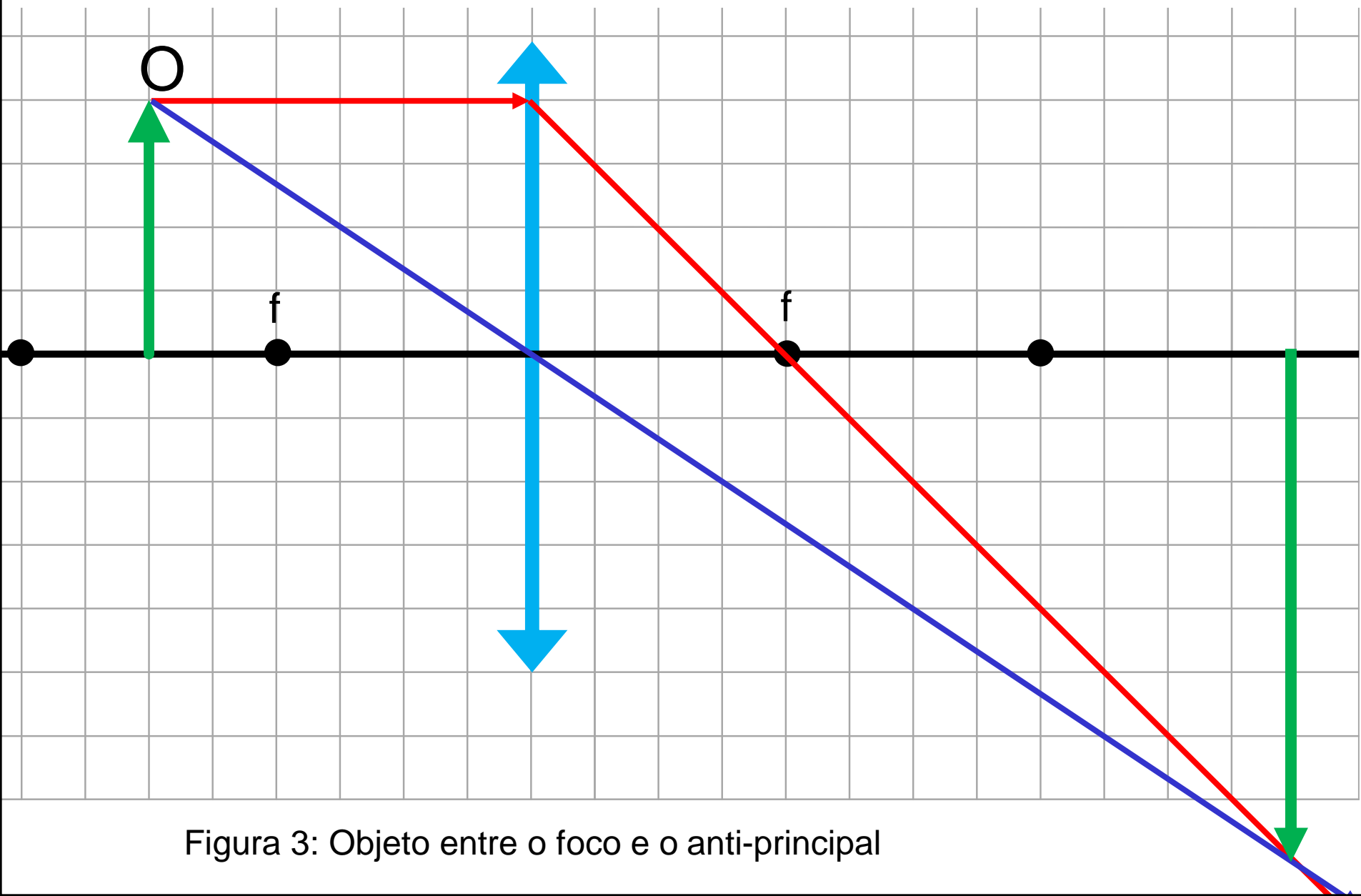


Figura 3: Objeto entre o foco e o anti-principal

CLASSIFICAÇÃO: Imagem REAL

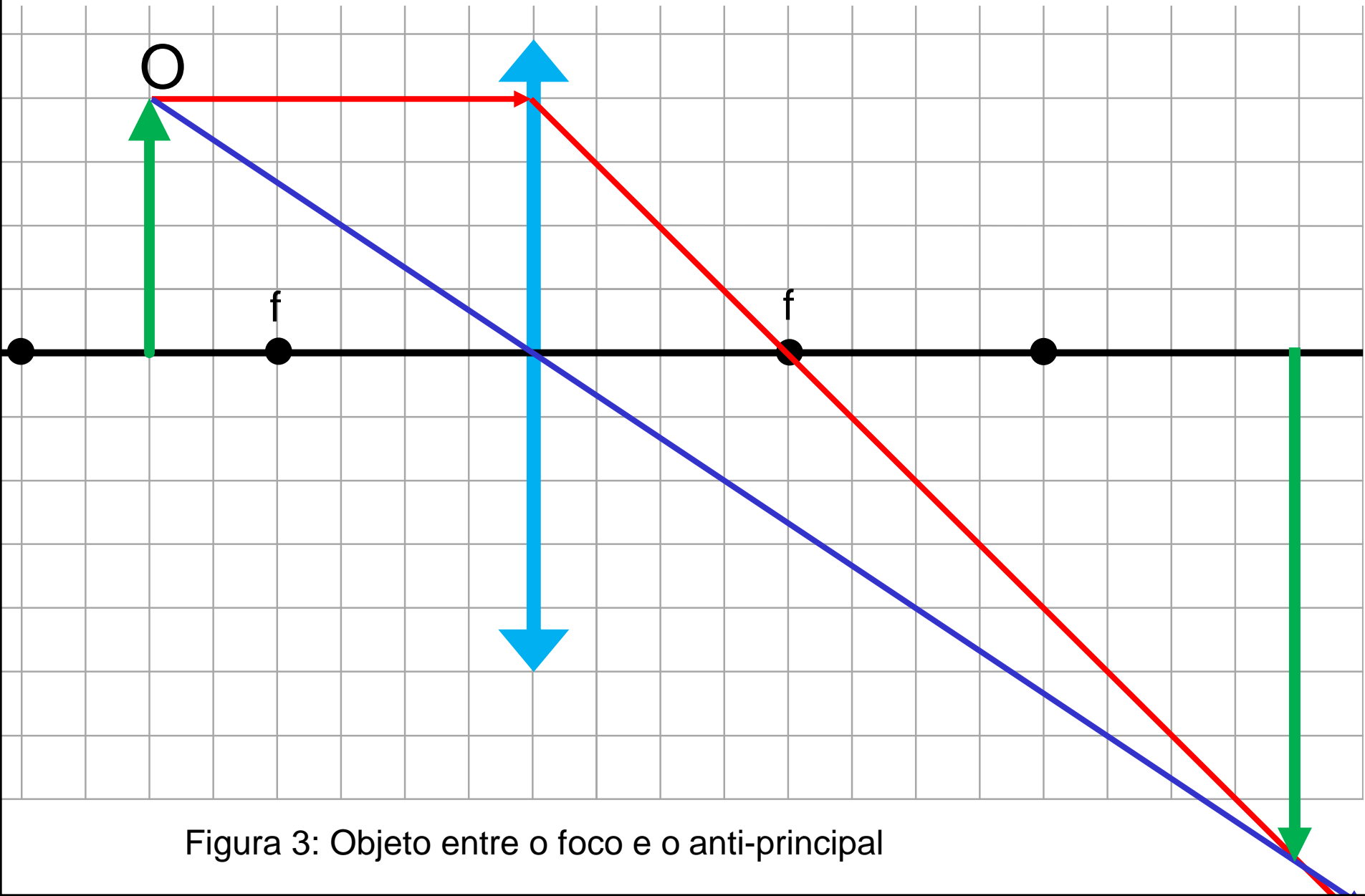


Figura 3: Objeto entre o foco e o anti-principal

CLASSIFICAÇÃO:

Imagem

REAL

INVERTIDA

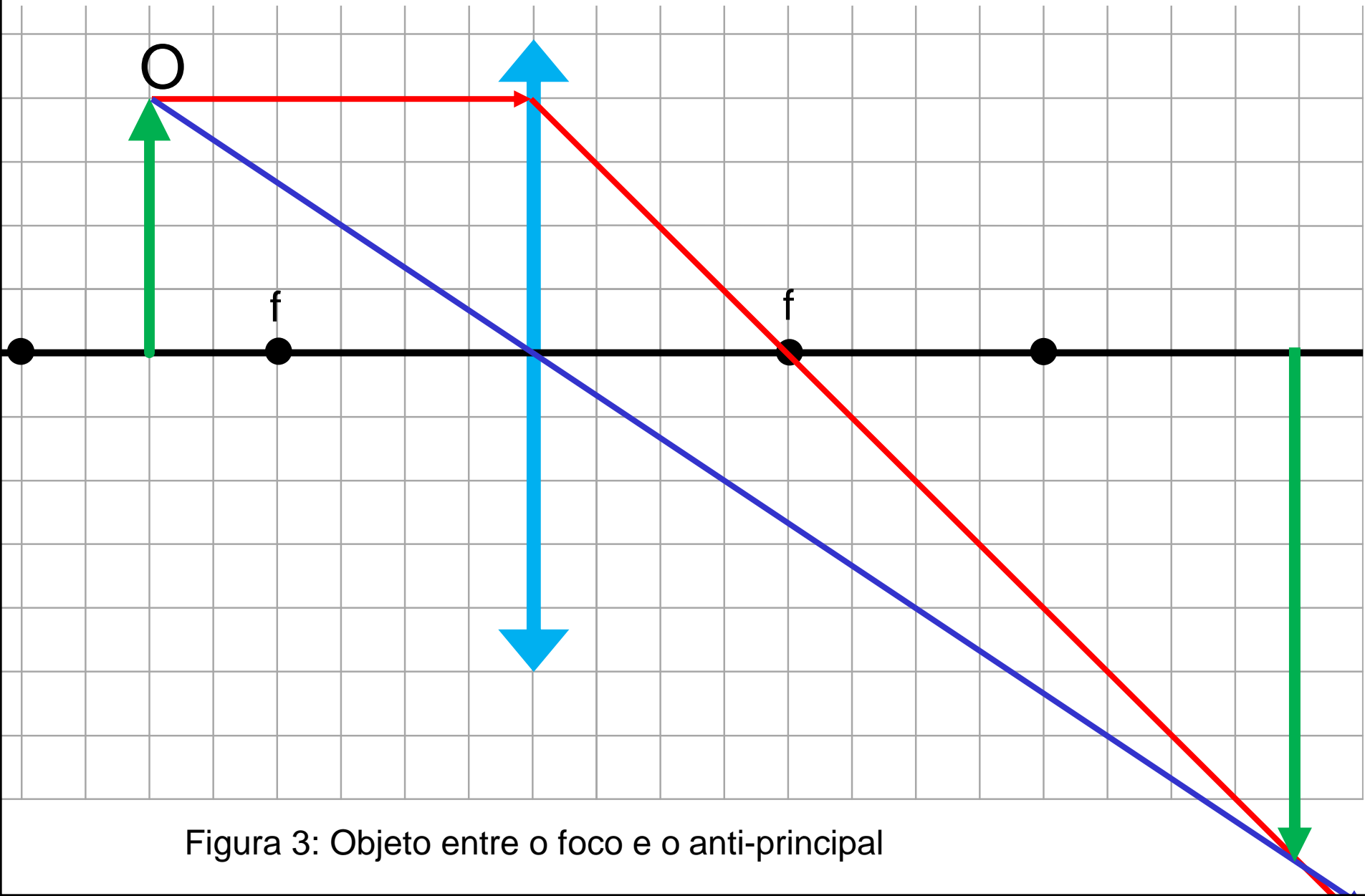


Figura 3: Objeto entre o foco e o anti-principal

CLASSIFICAÇÃO:

Imagem

REAL

INVERTIDA

MAIOR

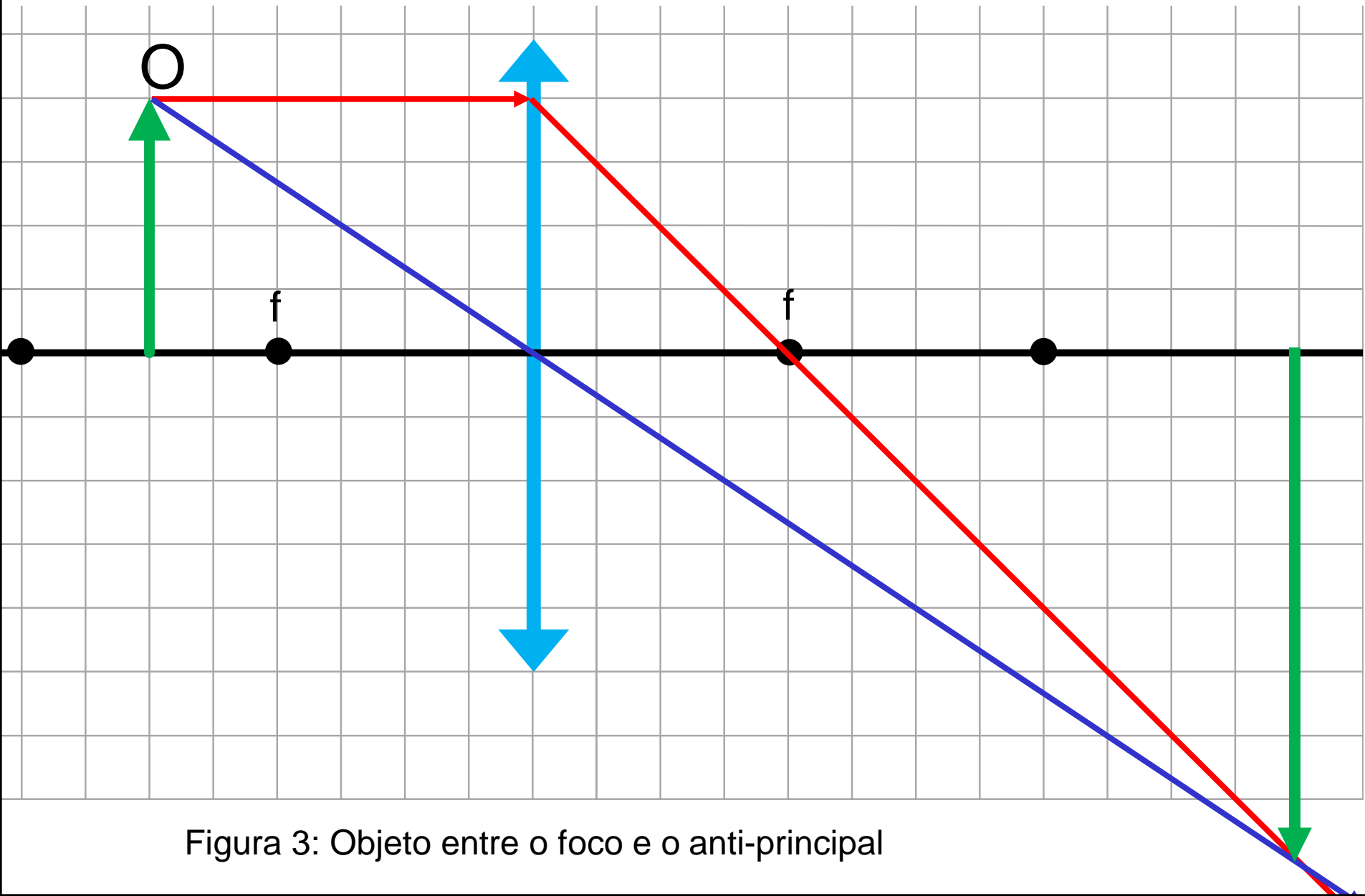


Figura 3: Objeto entre o foco e o anti-principal





Quarto caso

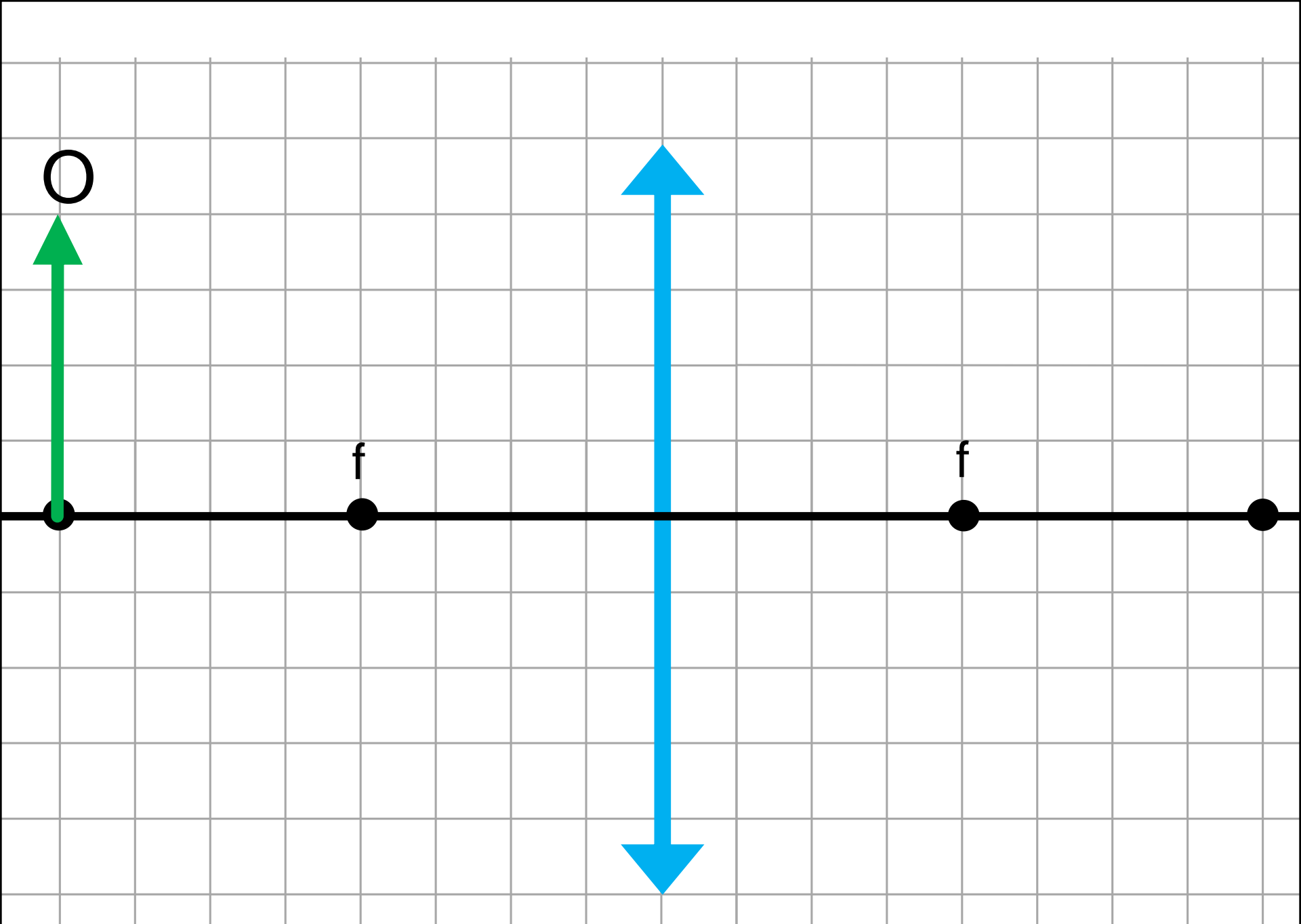


Figura 4: Objeto no anti-principal

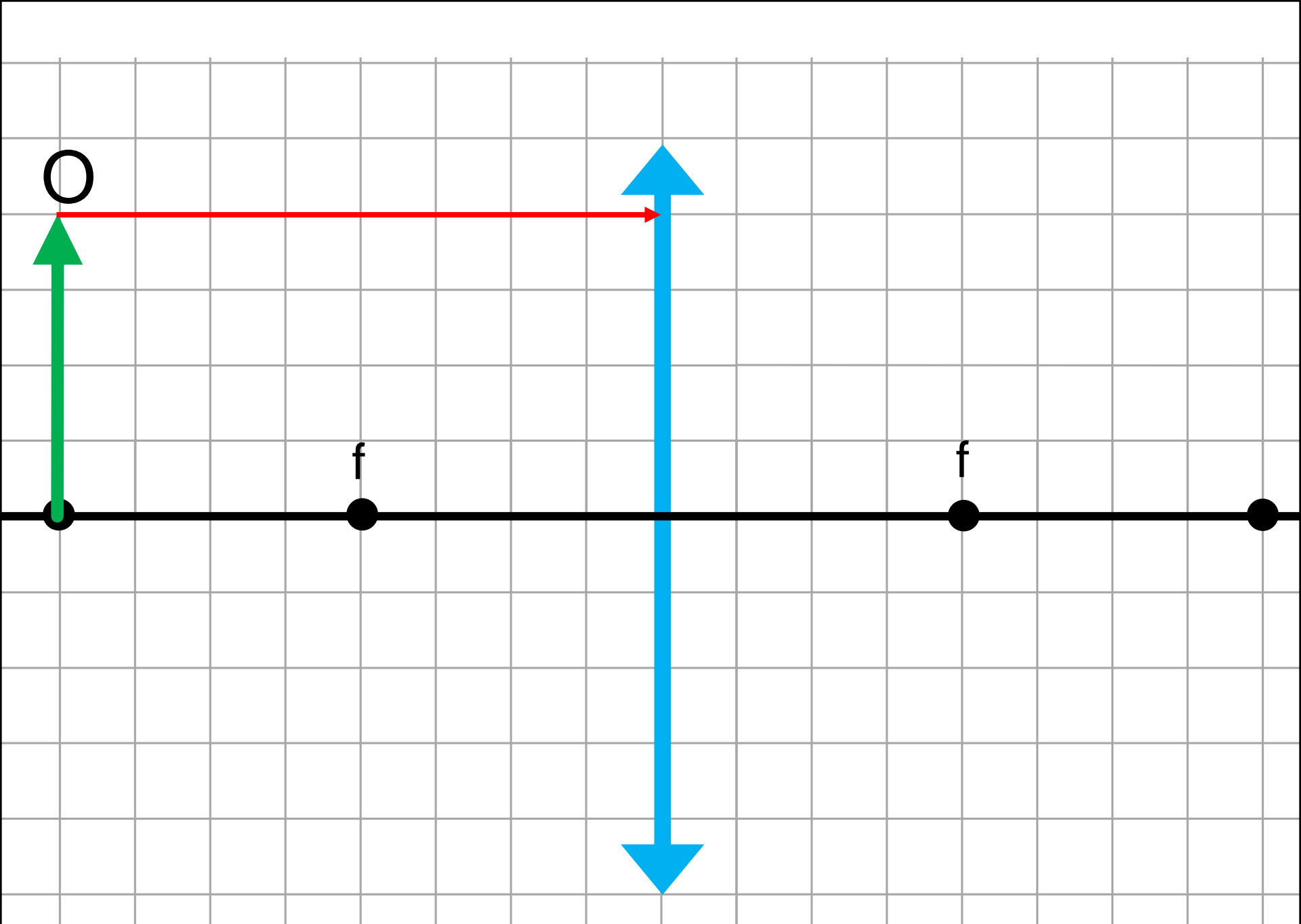


Figura 4: Objeto no anti-principal

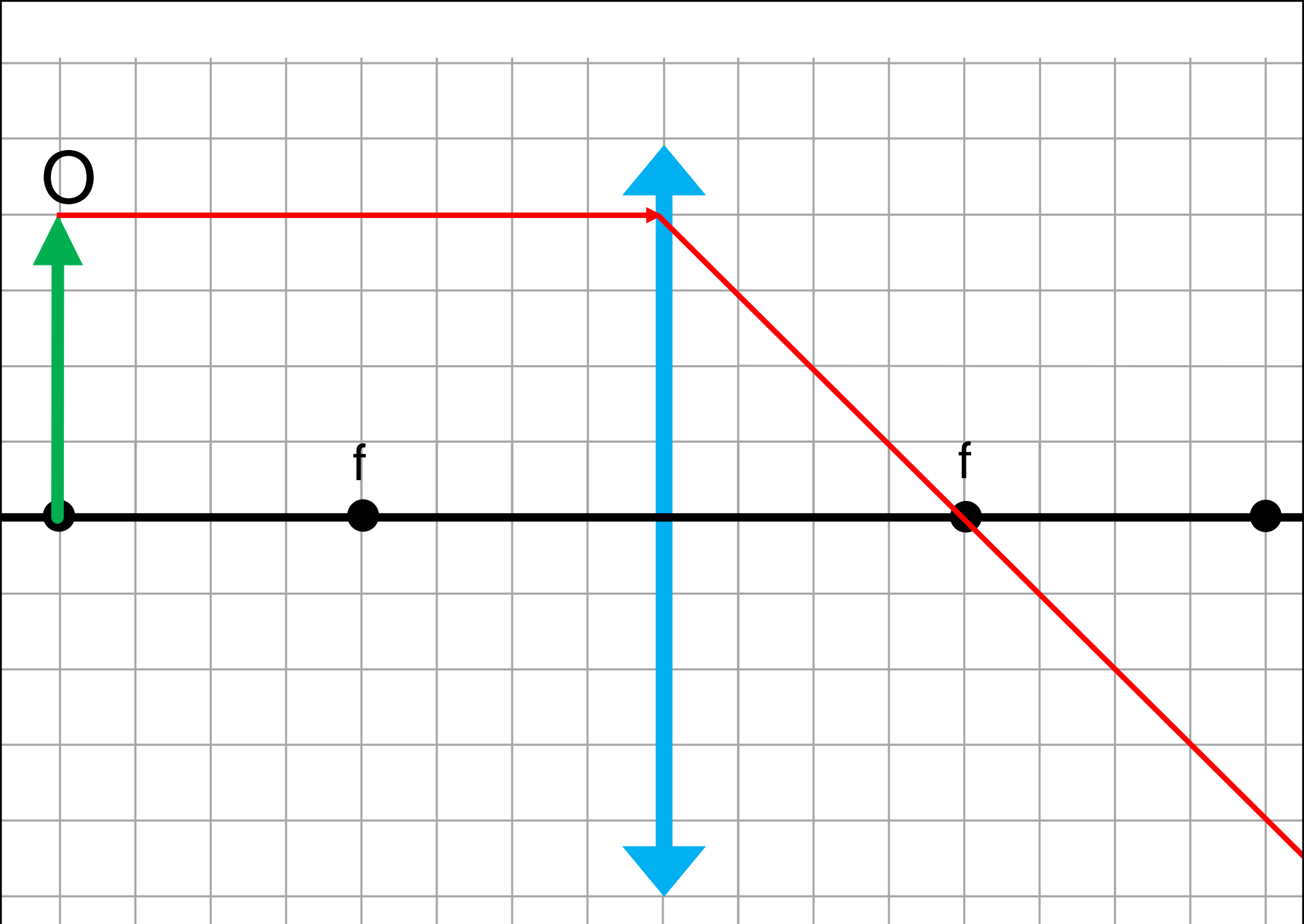


Figura 4: Objeto no anti-principal

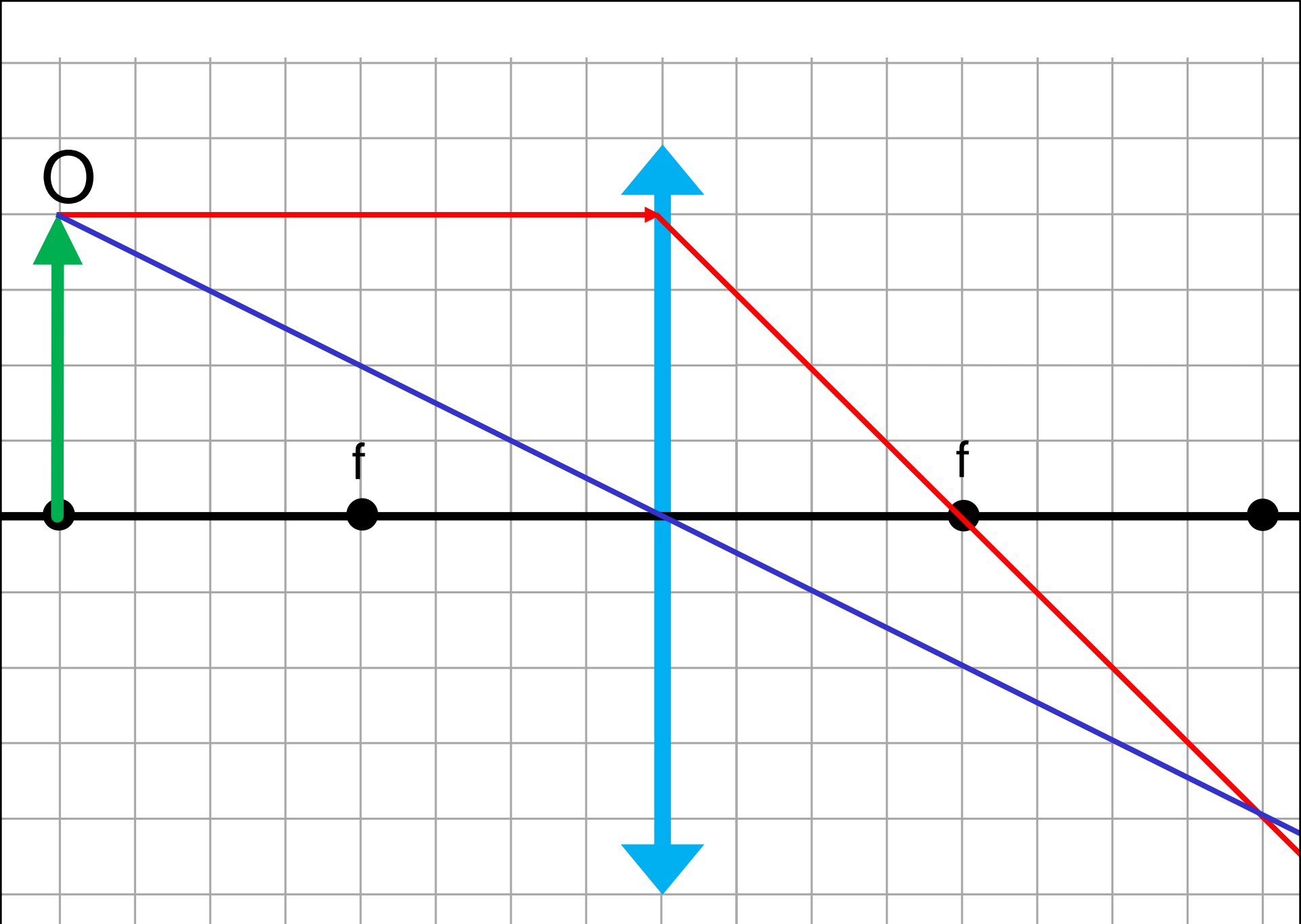


Figura 4: Objeto no anti-principal

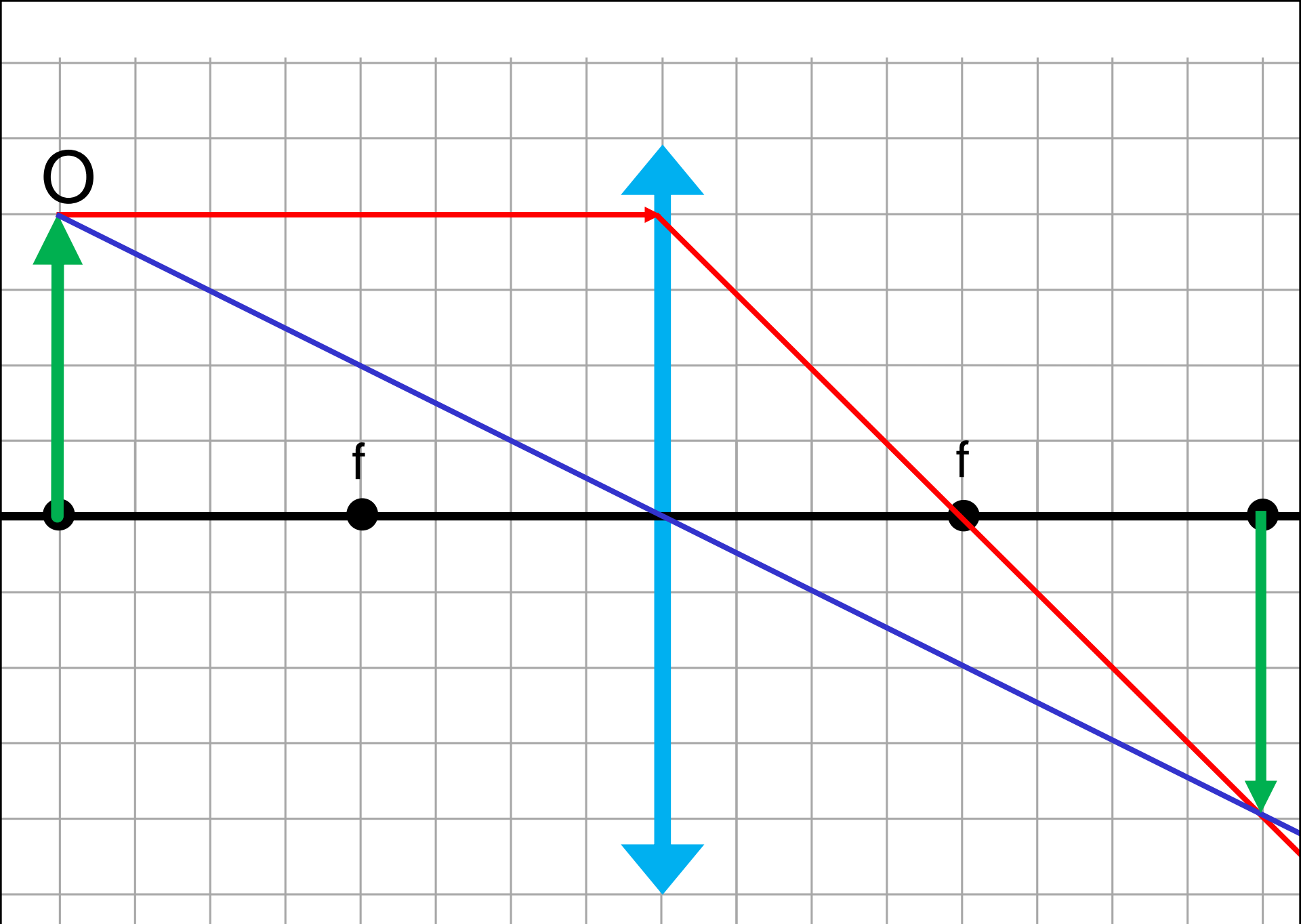


Figura 4: Objeto no anti-principal

CLASSIFICAÇÃO: Imagem REAL

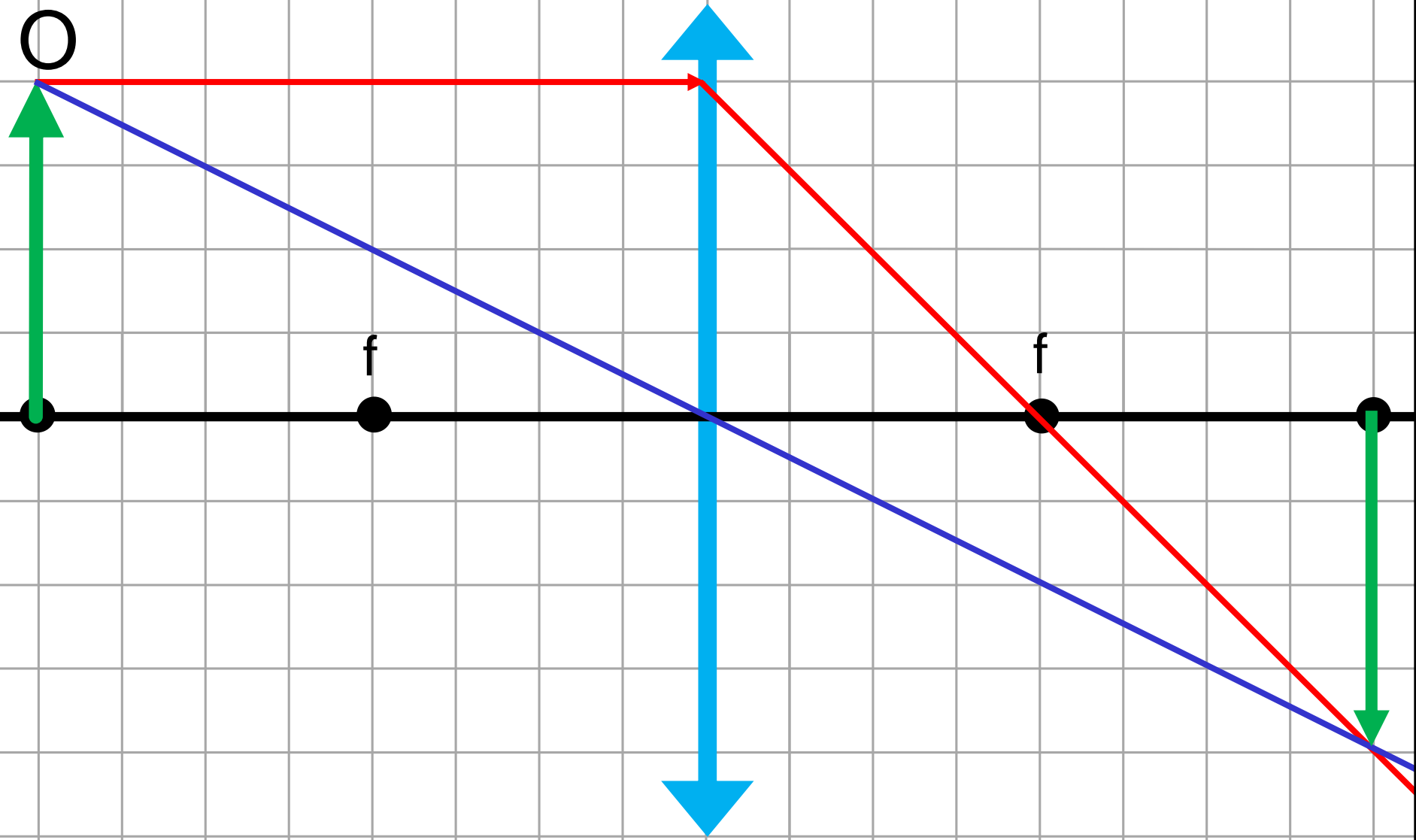


Figura 4: Objeto no anti-principal

CLASSIFICAÇÃO:

Imagem

REAL  
INVERTIDA

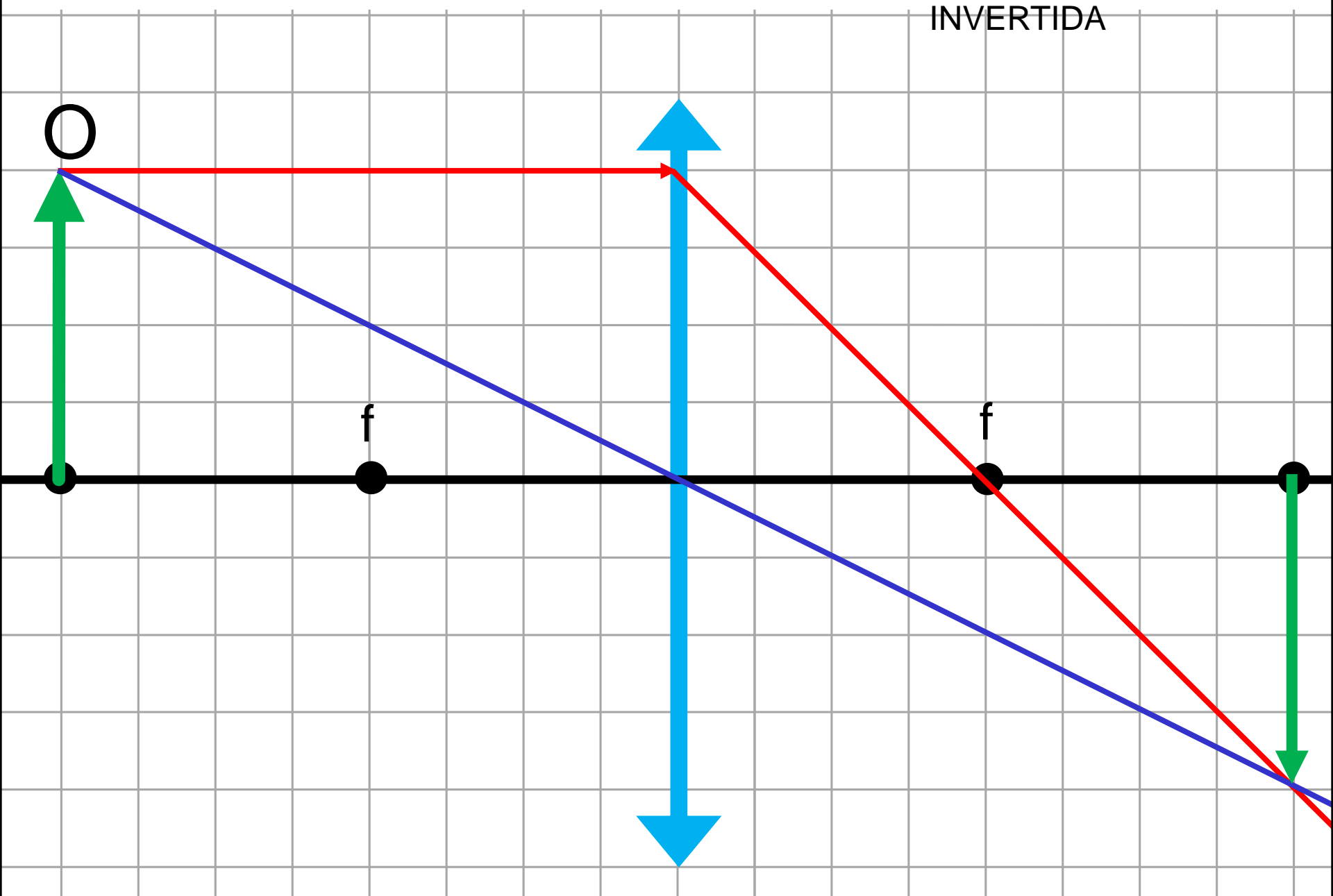


Figura 4: Objeto no anti-principal



CLASSIFICAÇÃO:

Imagem

REAL

INVERTIDA

IGUAL

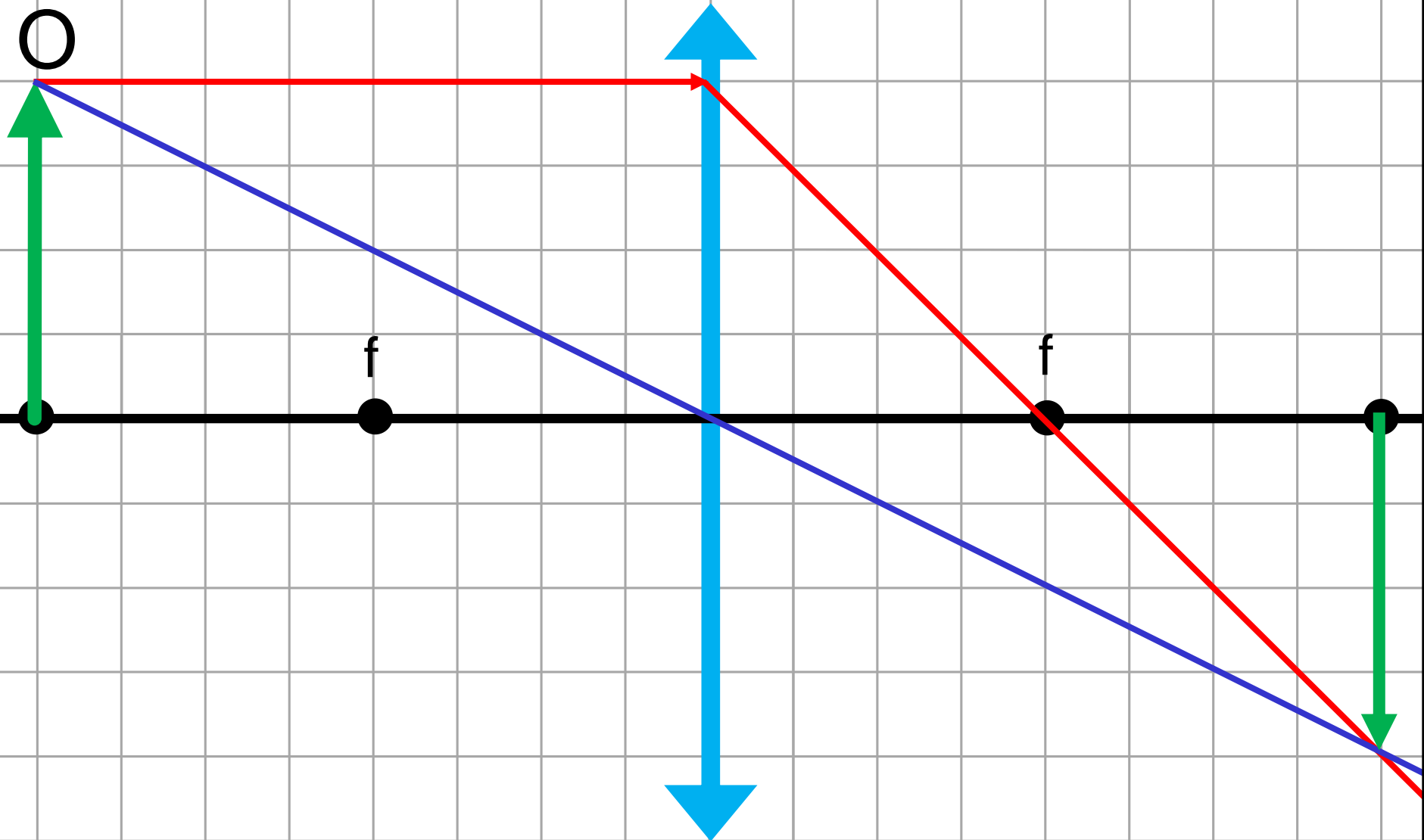


Figura 4: Objeto no anti-principal



Quinto caso

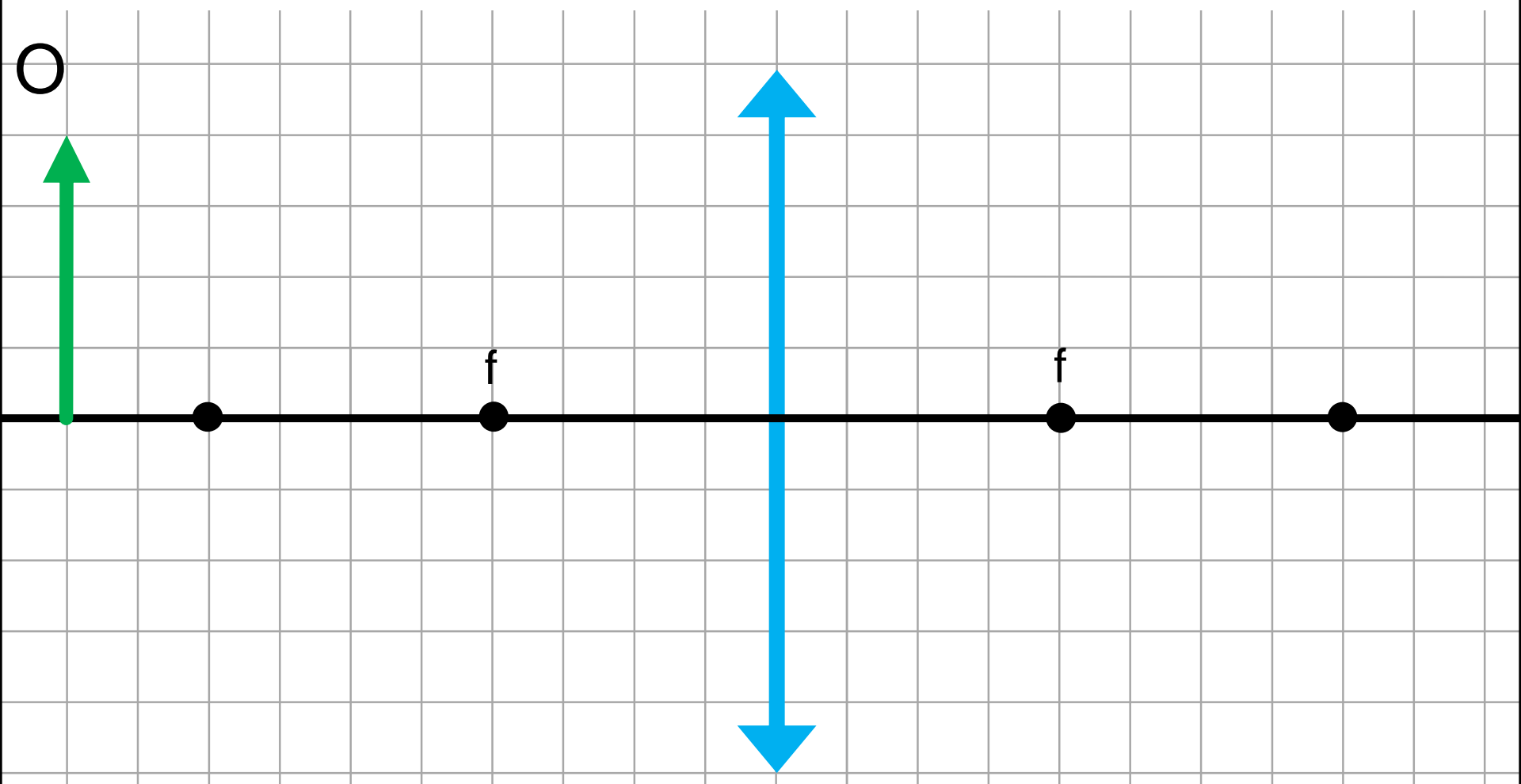


Figura 5: Objeto além do anti-principal

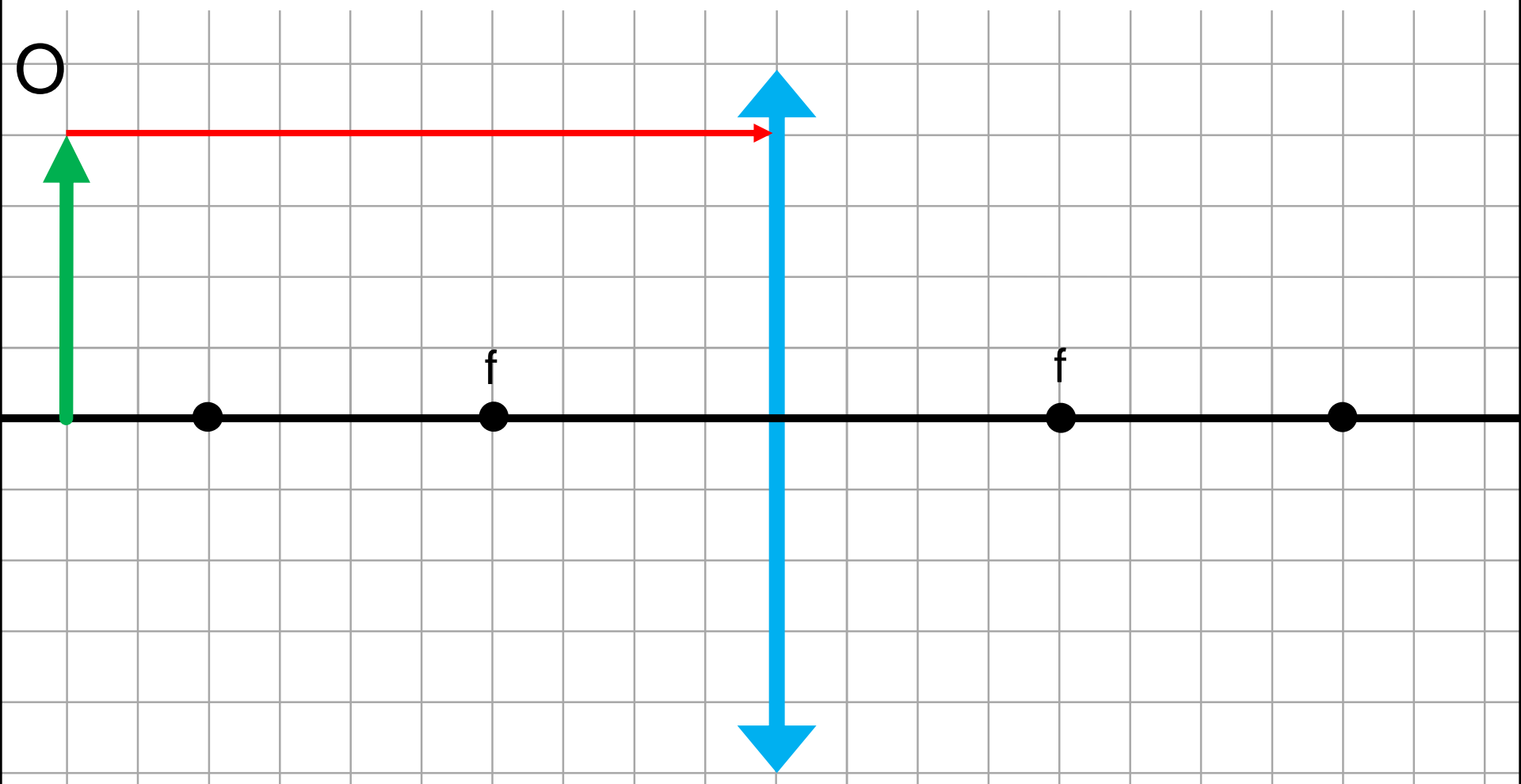


Figura 5: Objeto além do anti-principal

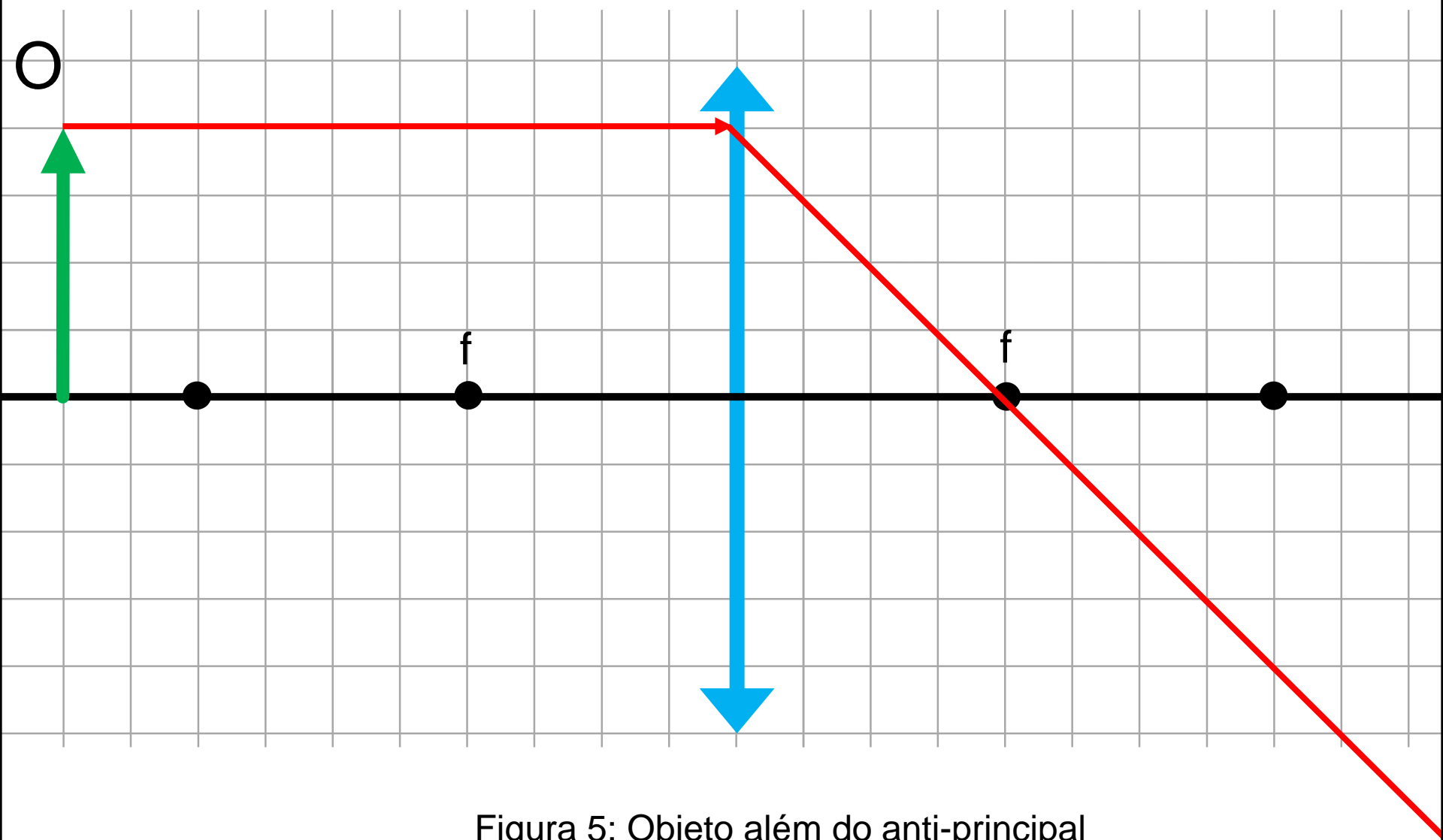


Figura 5: Objeto além do anti-principal

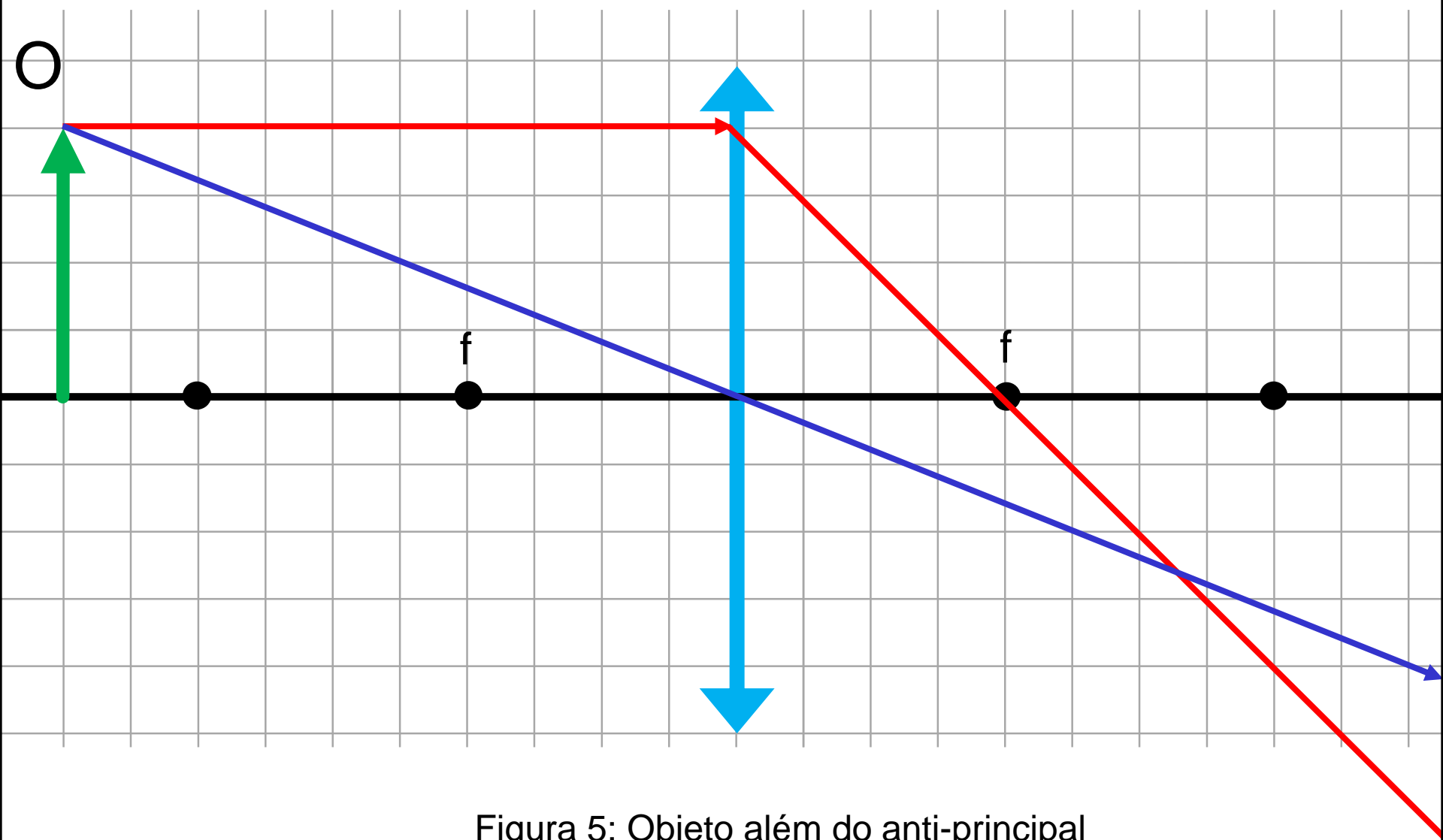


Figura 5: Objeto além do anti-principal

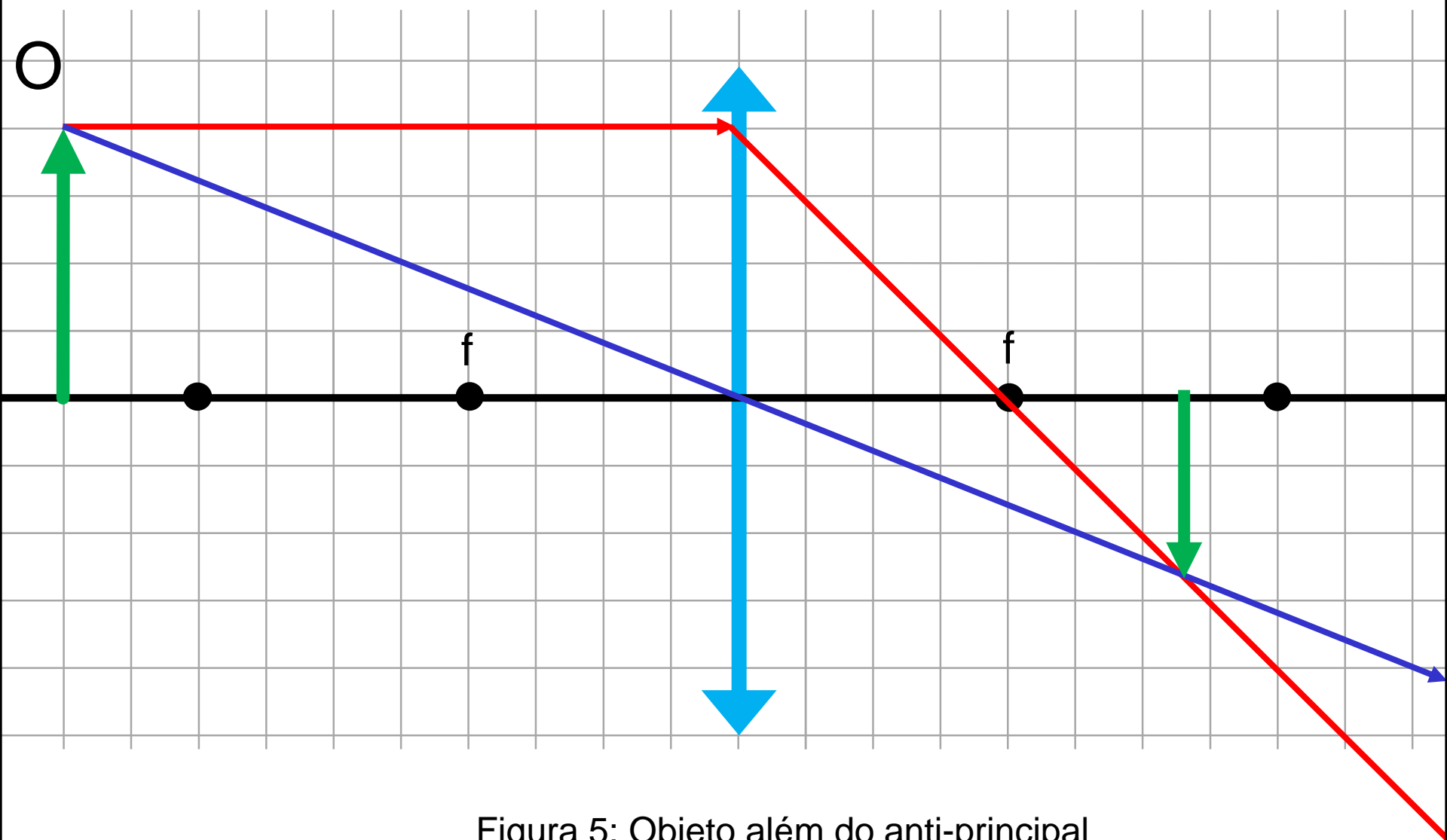


Figura 5: Objeto além do anti-principal

CLASSIFICAÇÃO: Imagem REAL

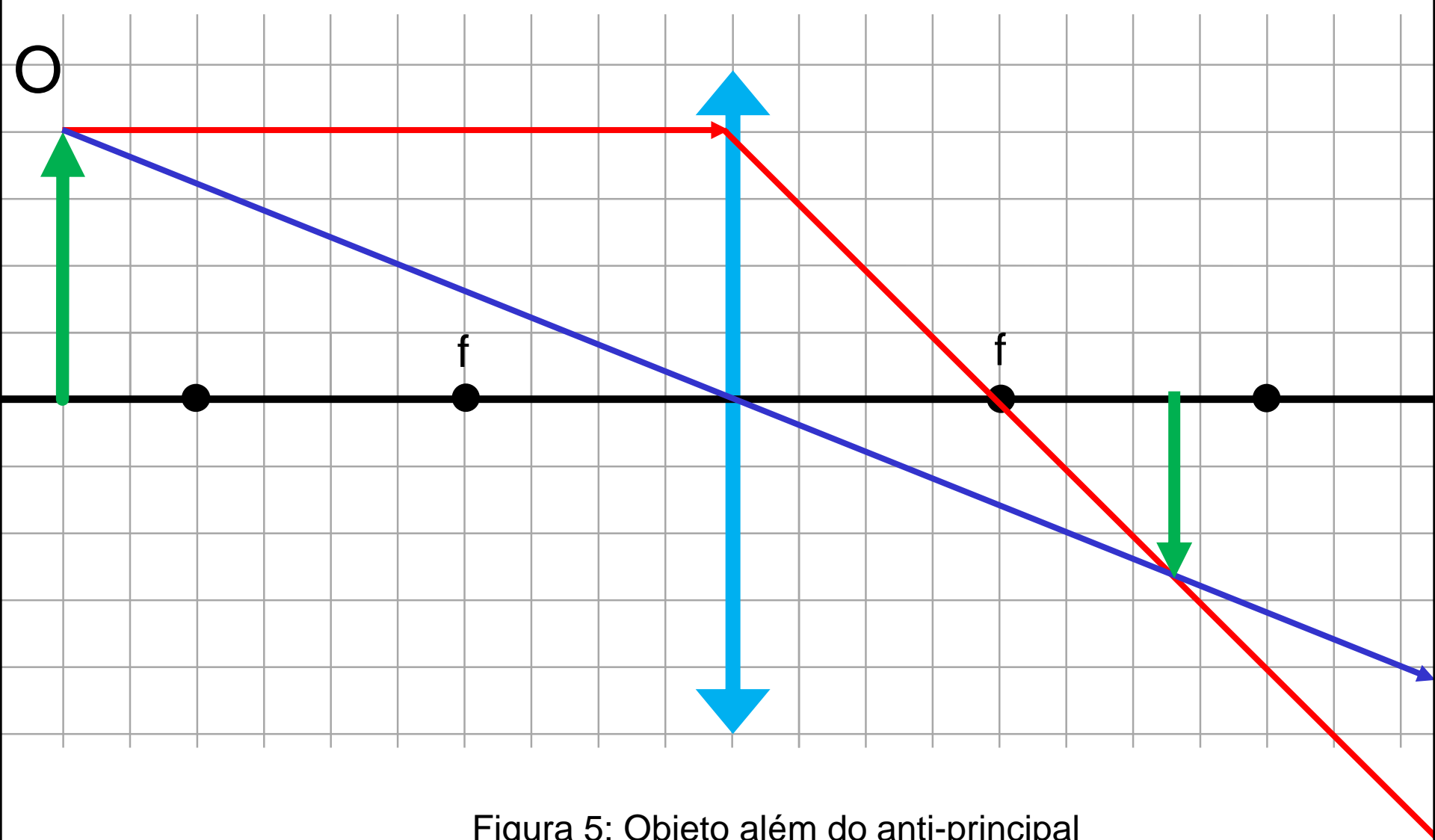


Figura 5: Objeto além do anti-principal



CLASSIFICAÇÃO: Imagem REAL  
INVERTIDA

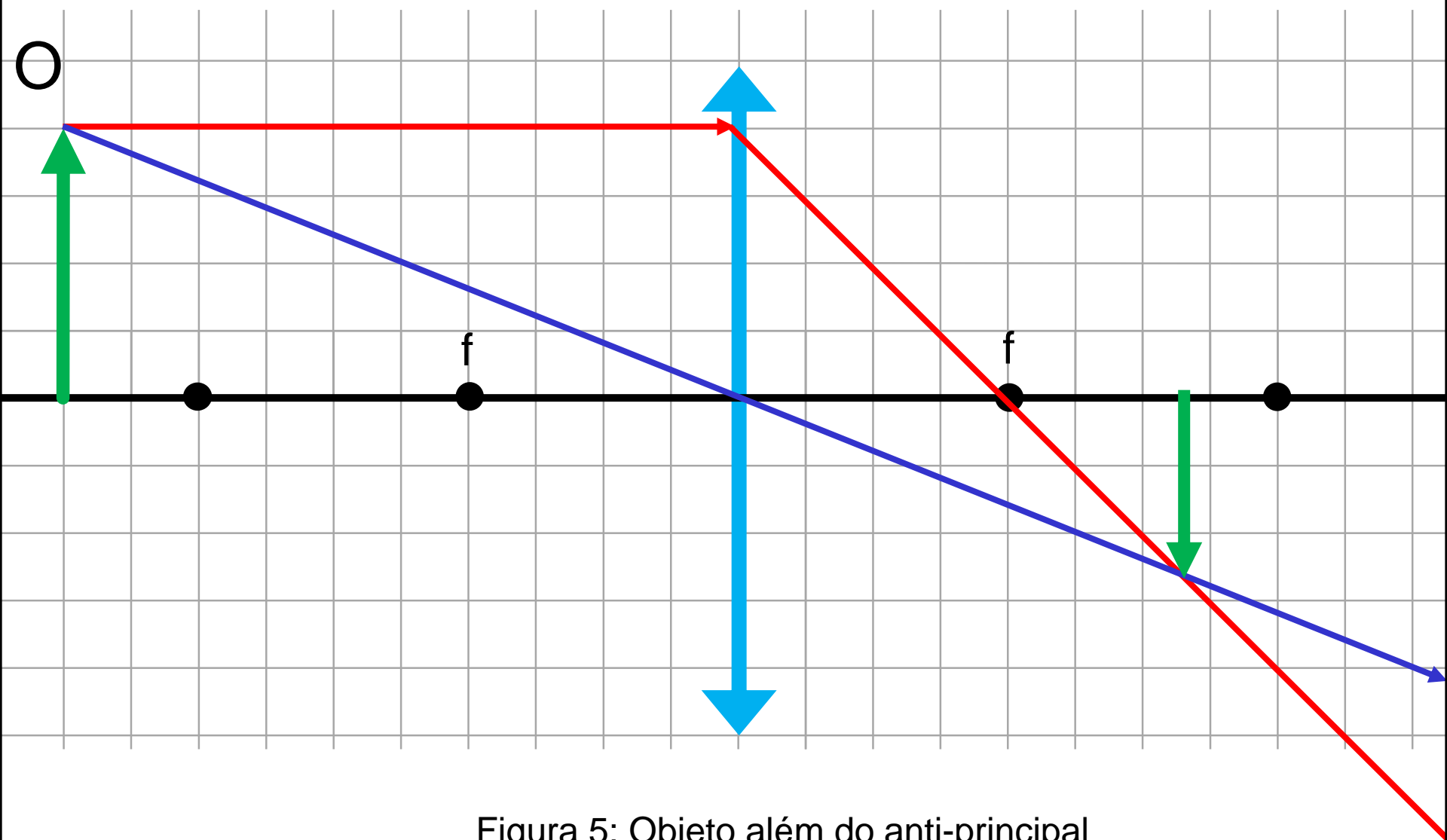


Figura 5: Objeto além do anti-principal

CLASSIFICAÇÃO:

Imagem

REAL  
INVERTIDA  
MENOR

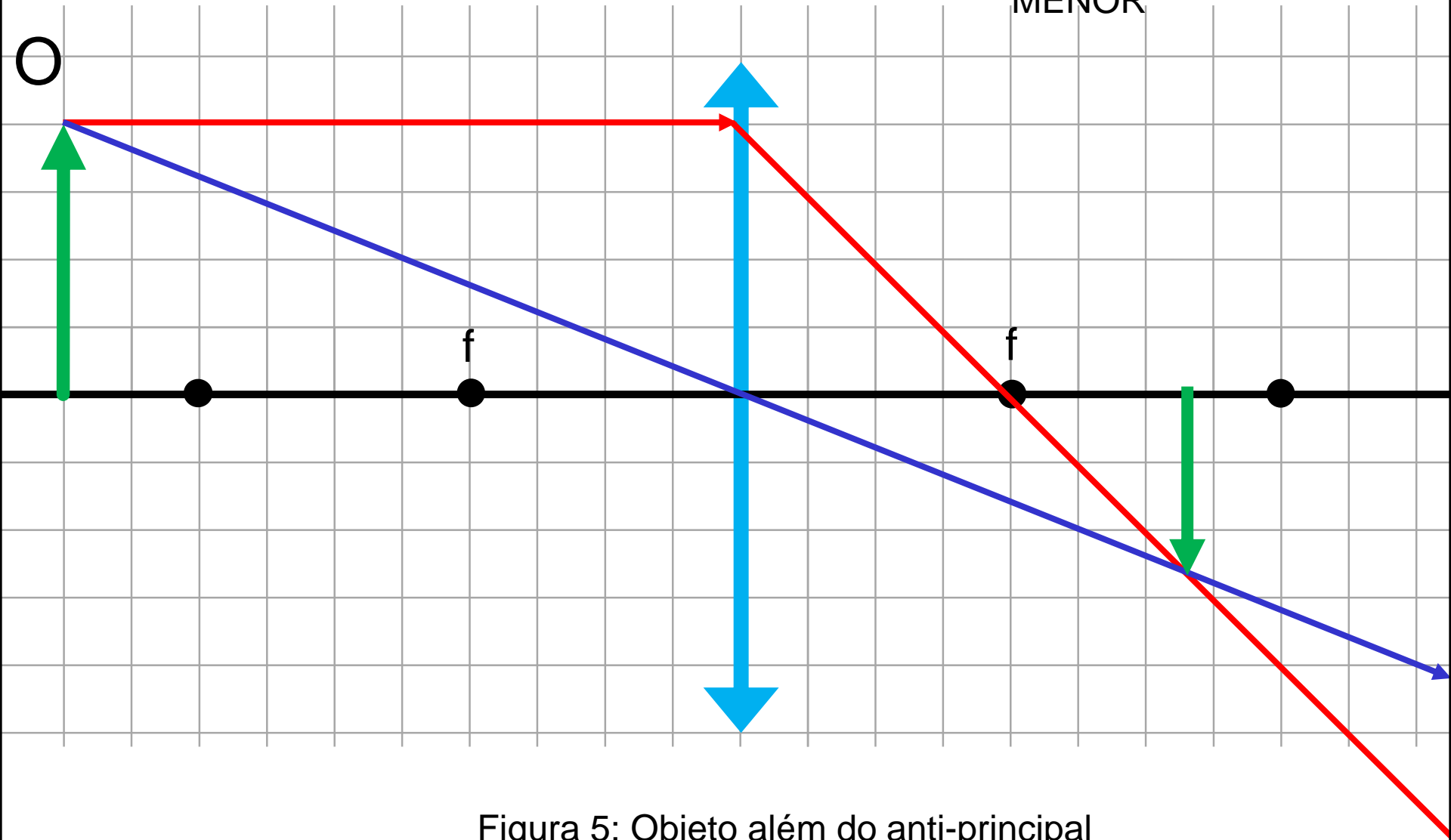
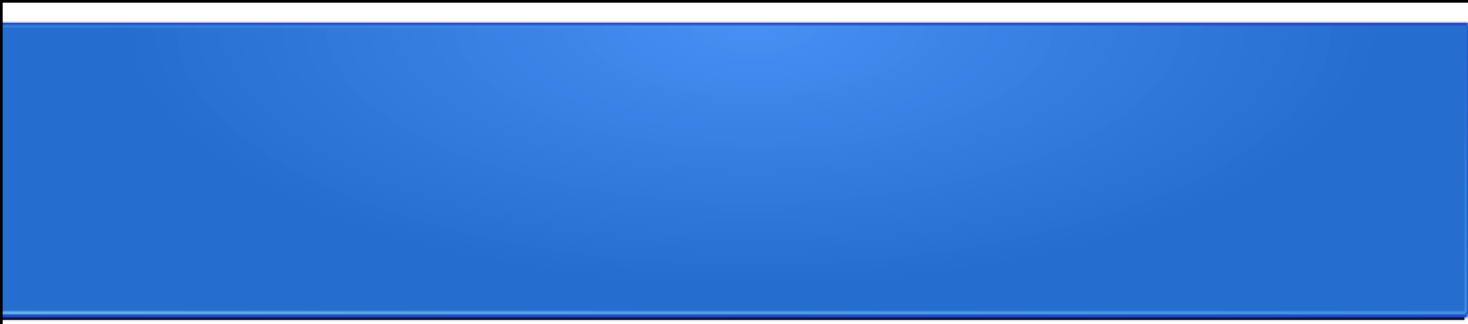


Figura 5: Objeto além do anti-principal



# Sexto Caso

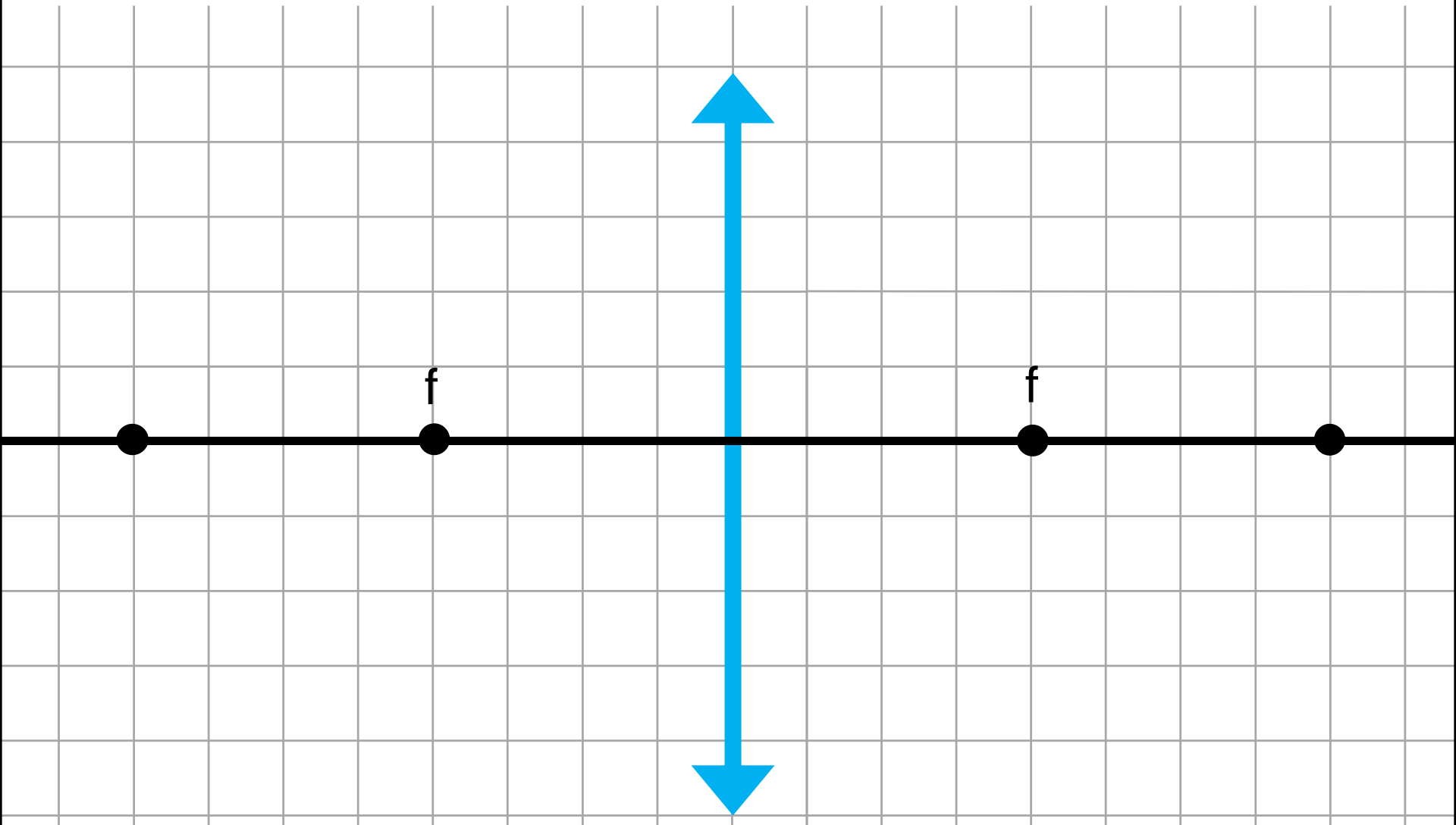


Figura 6: Objeto no “infinito”

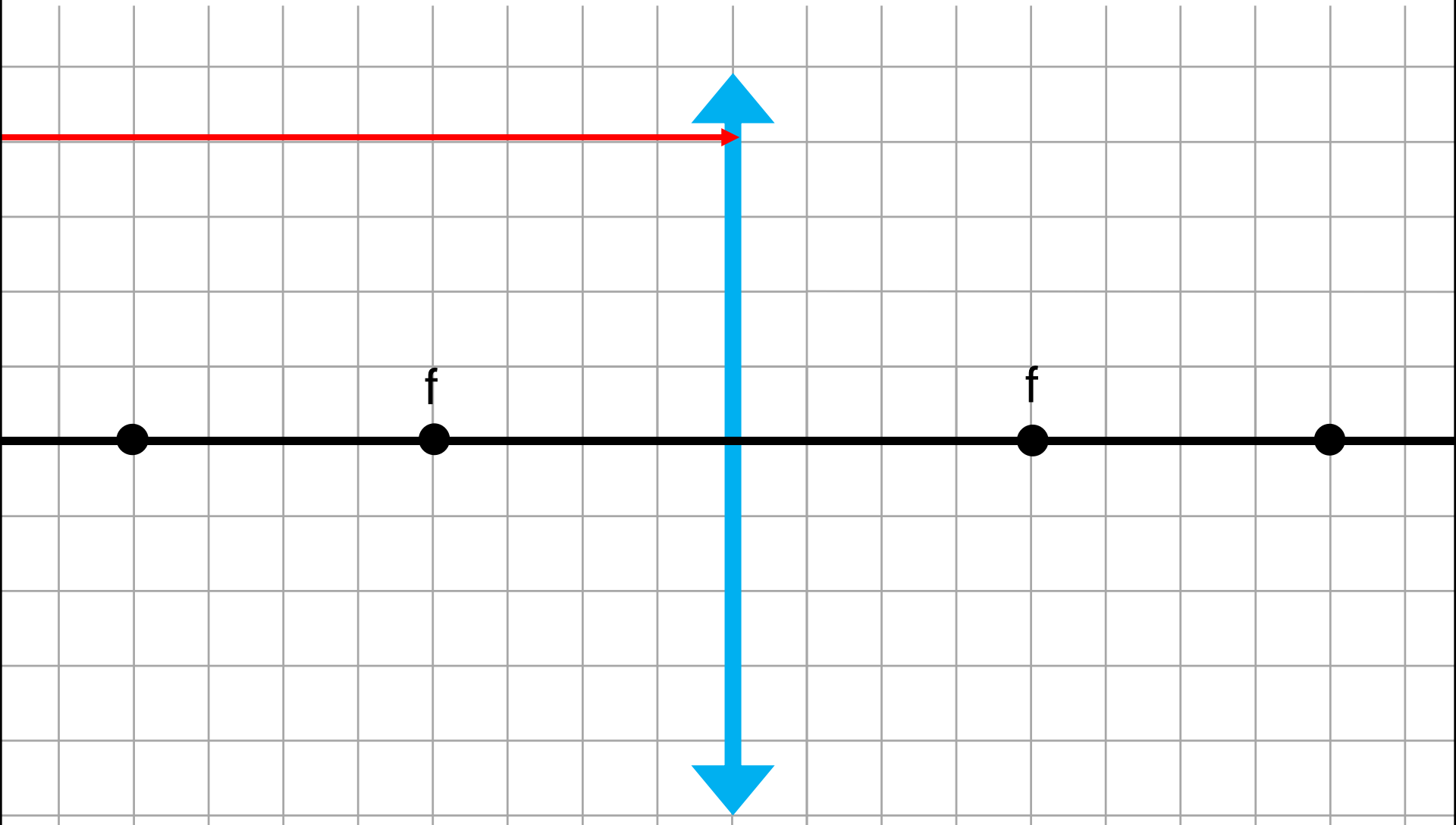


Figura 6: Objeto no “infinito”

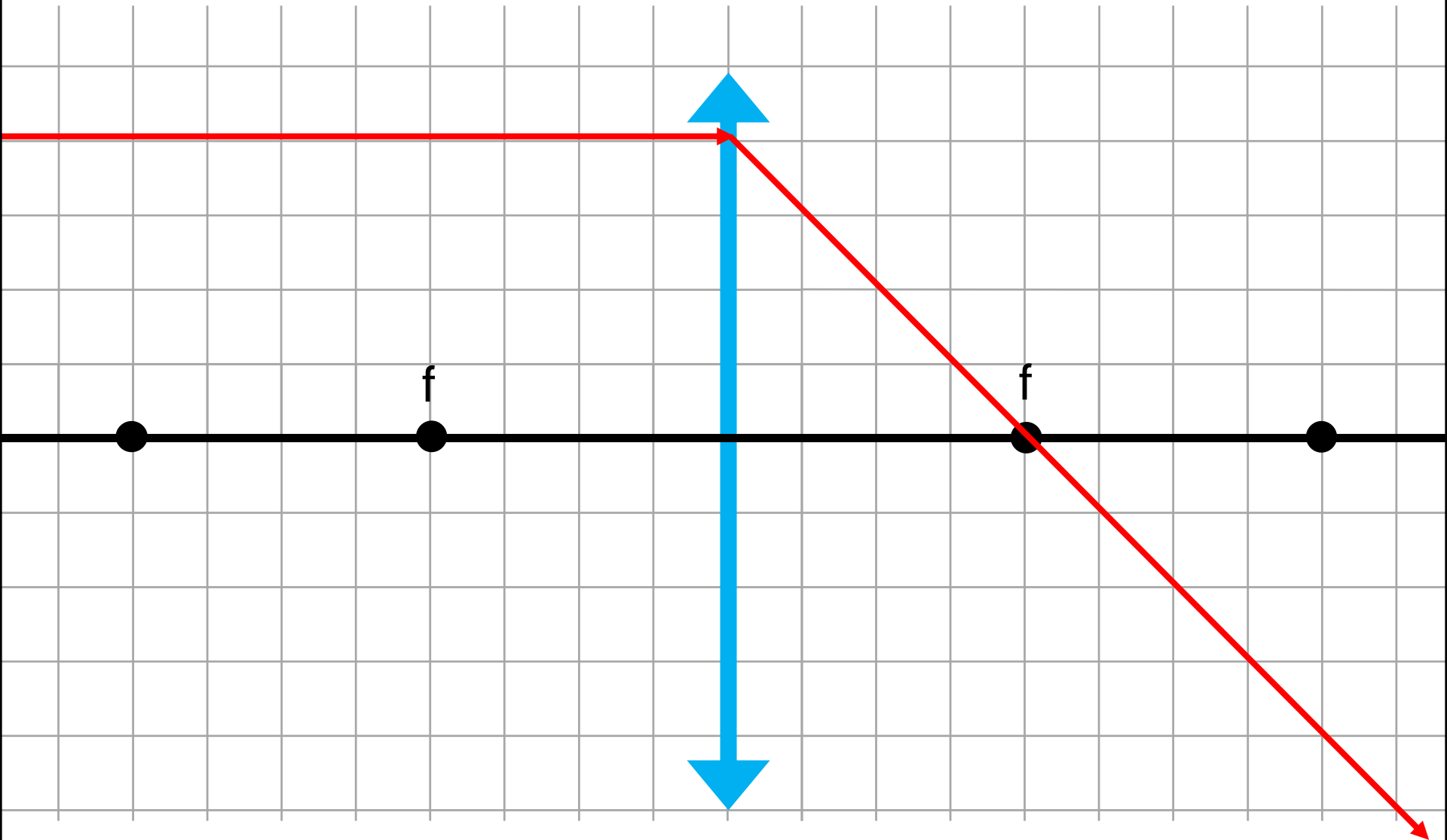


Figura 6: Objeto no “infinito”

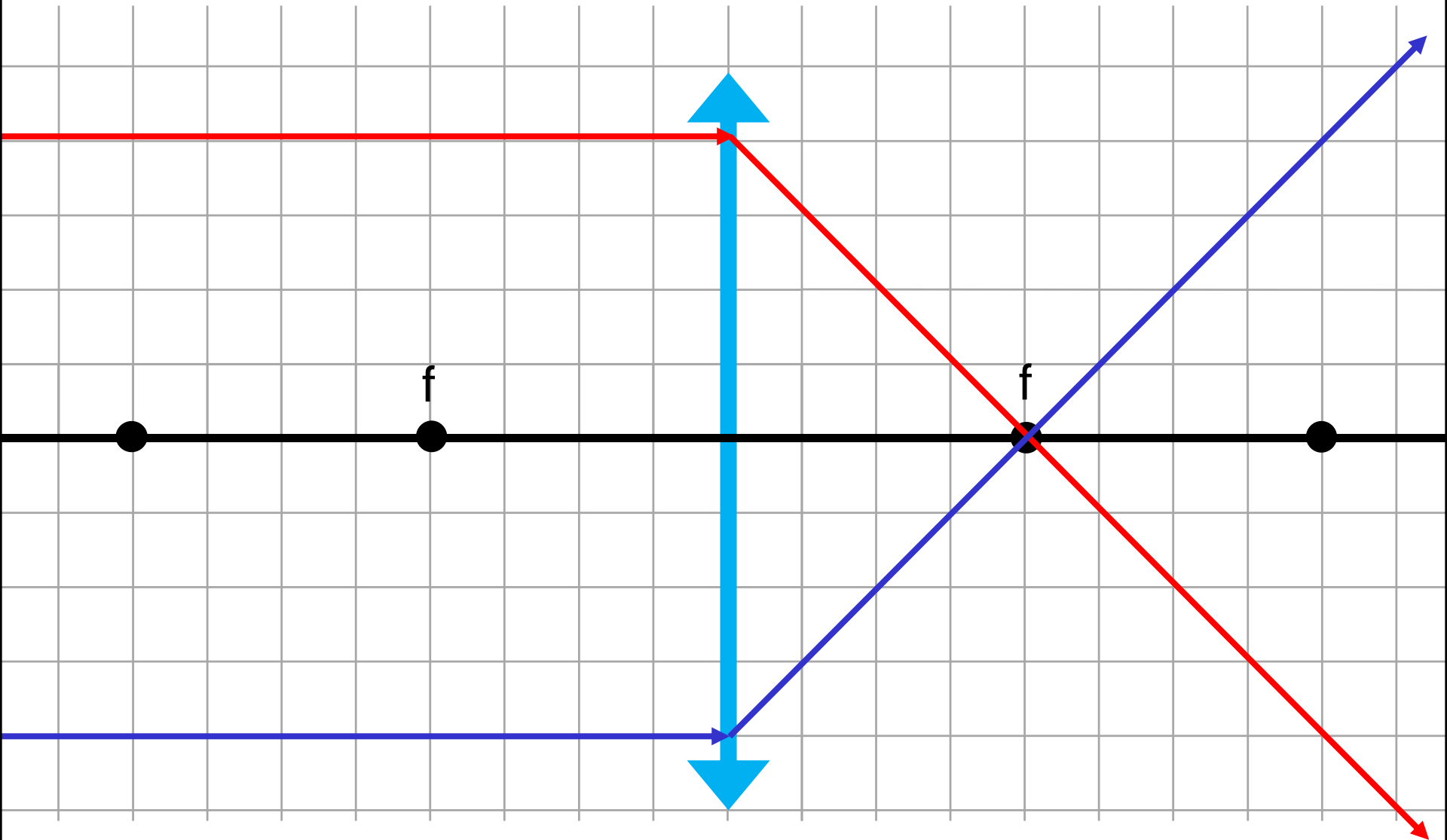


Figura 6: Objeto no “infinito”

CLASSIFICAÇÃO: Imagem

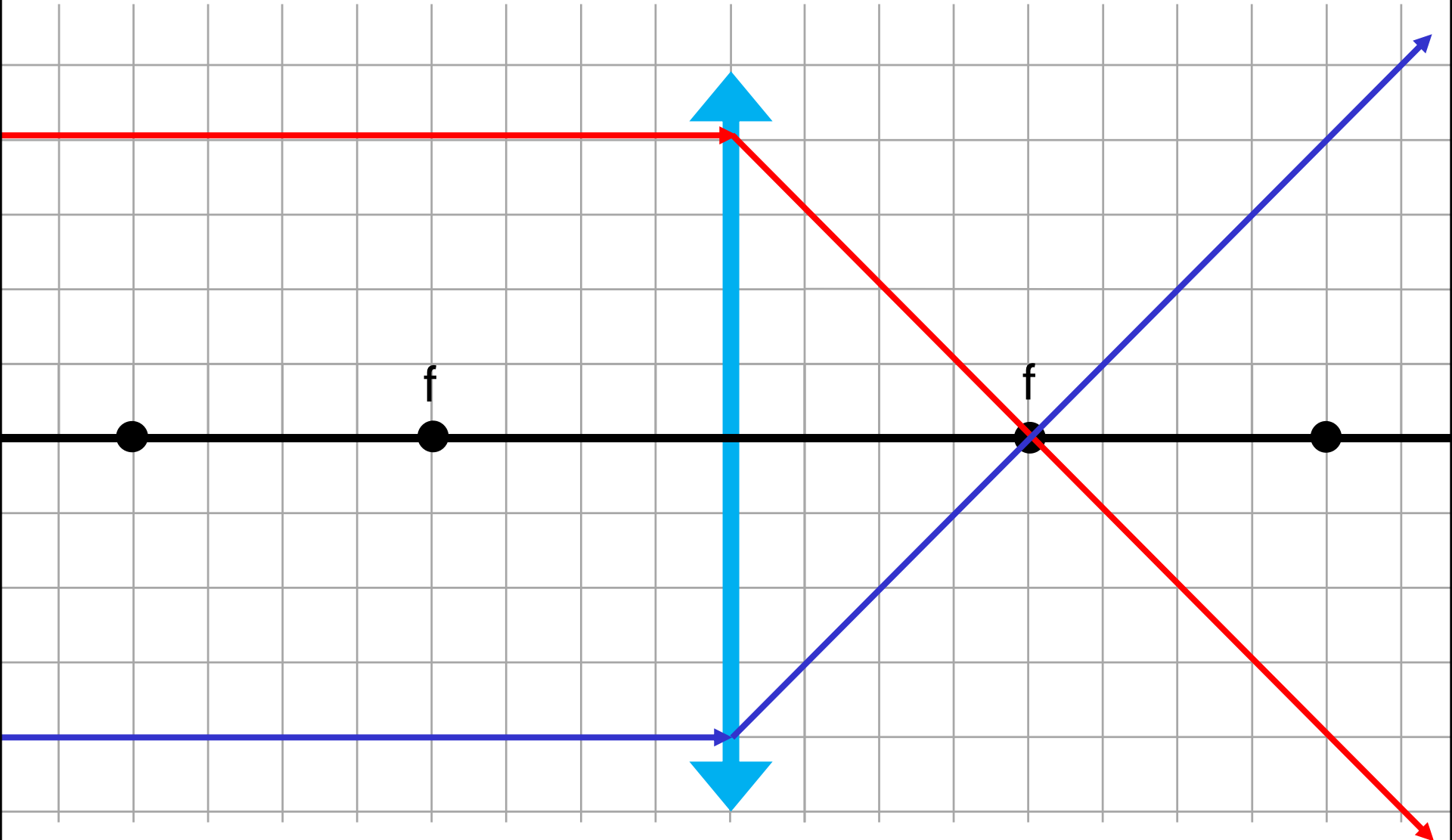


Figura 6: Objeto no “infinito”



CLASSIFICAÇÃO:

Imagem PONTUAL, REAL  
E LOCALIZADA NO FOCO  
IMAGEM

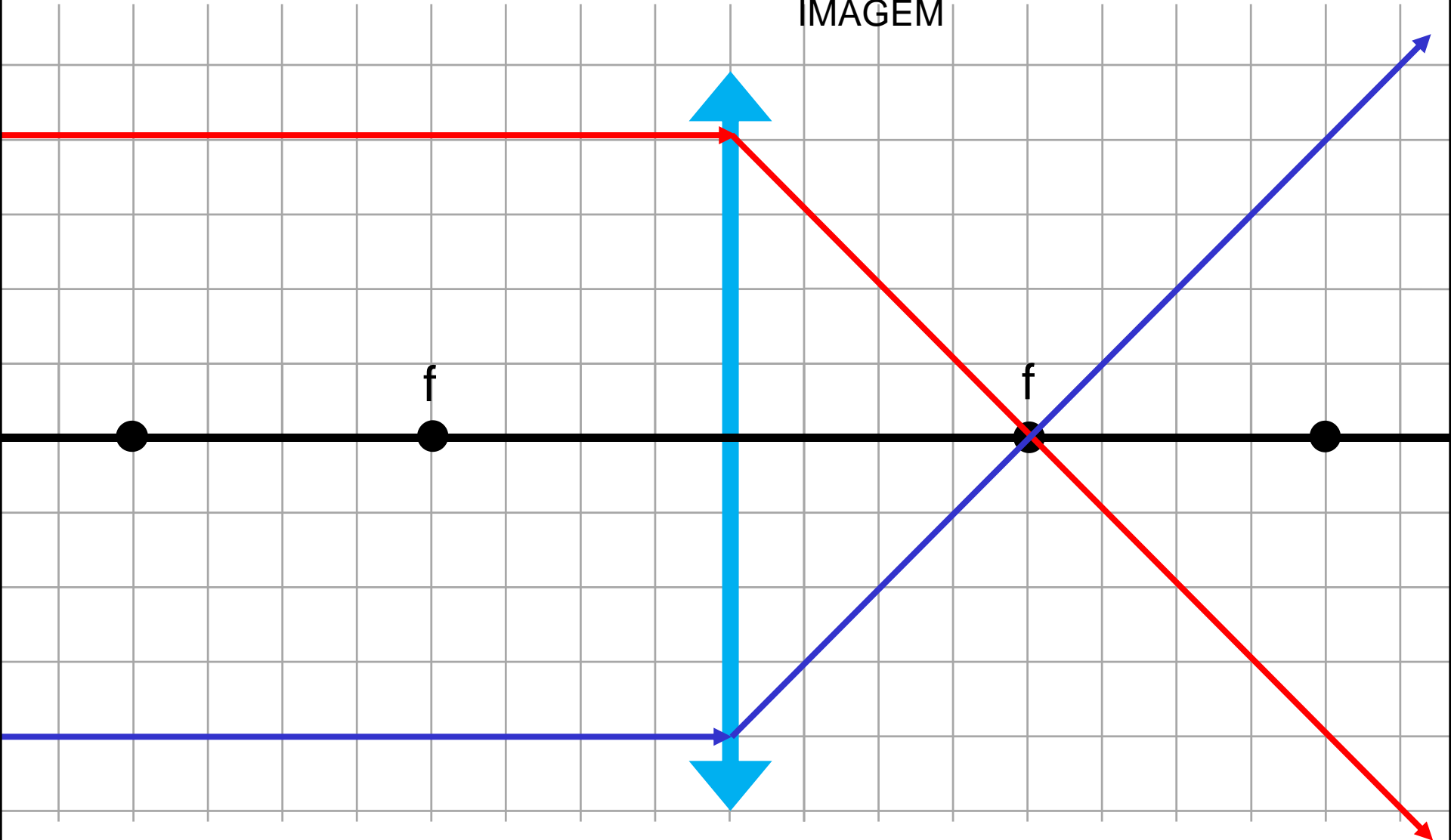


Figura 6: Objeto no “infinito”



# LENTES DIVERGENTES



Primeiro caso

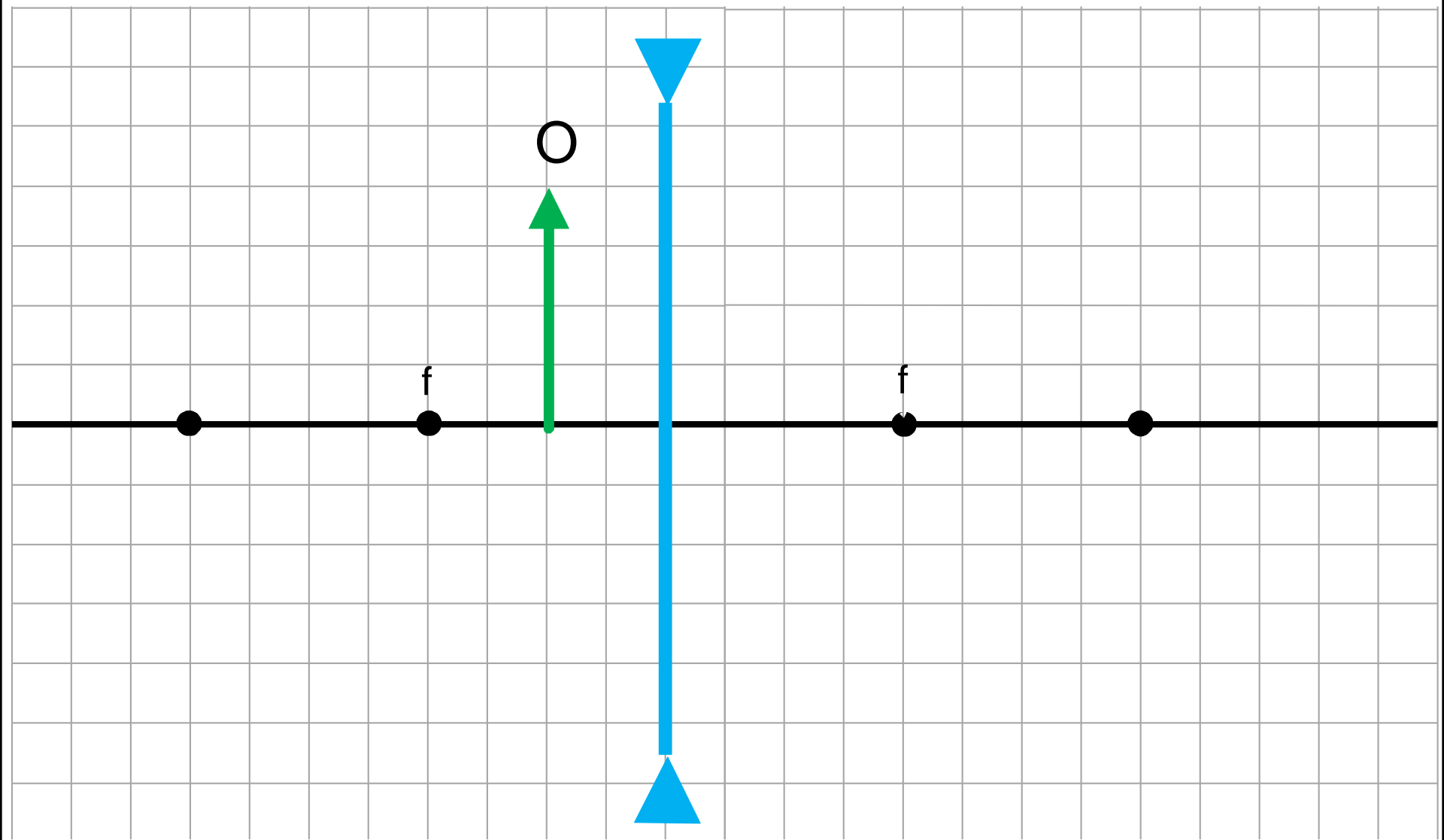


Figura 7: Objeto entre o vértice e o foco

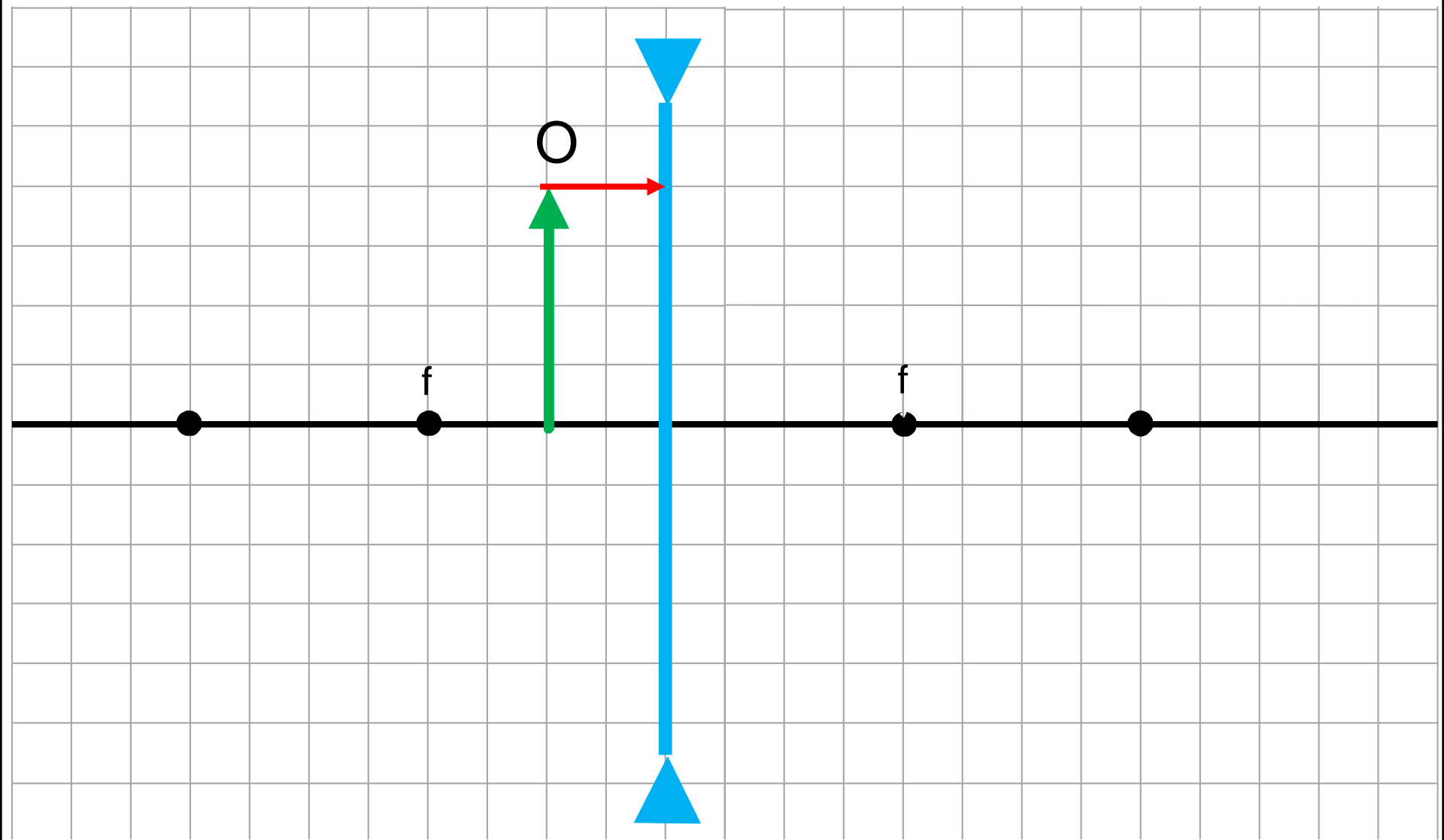


Figura 7: Objeto entre o vértice e o foco

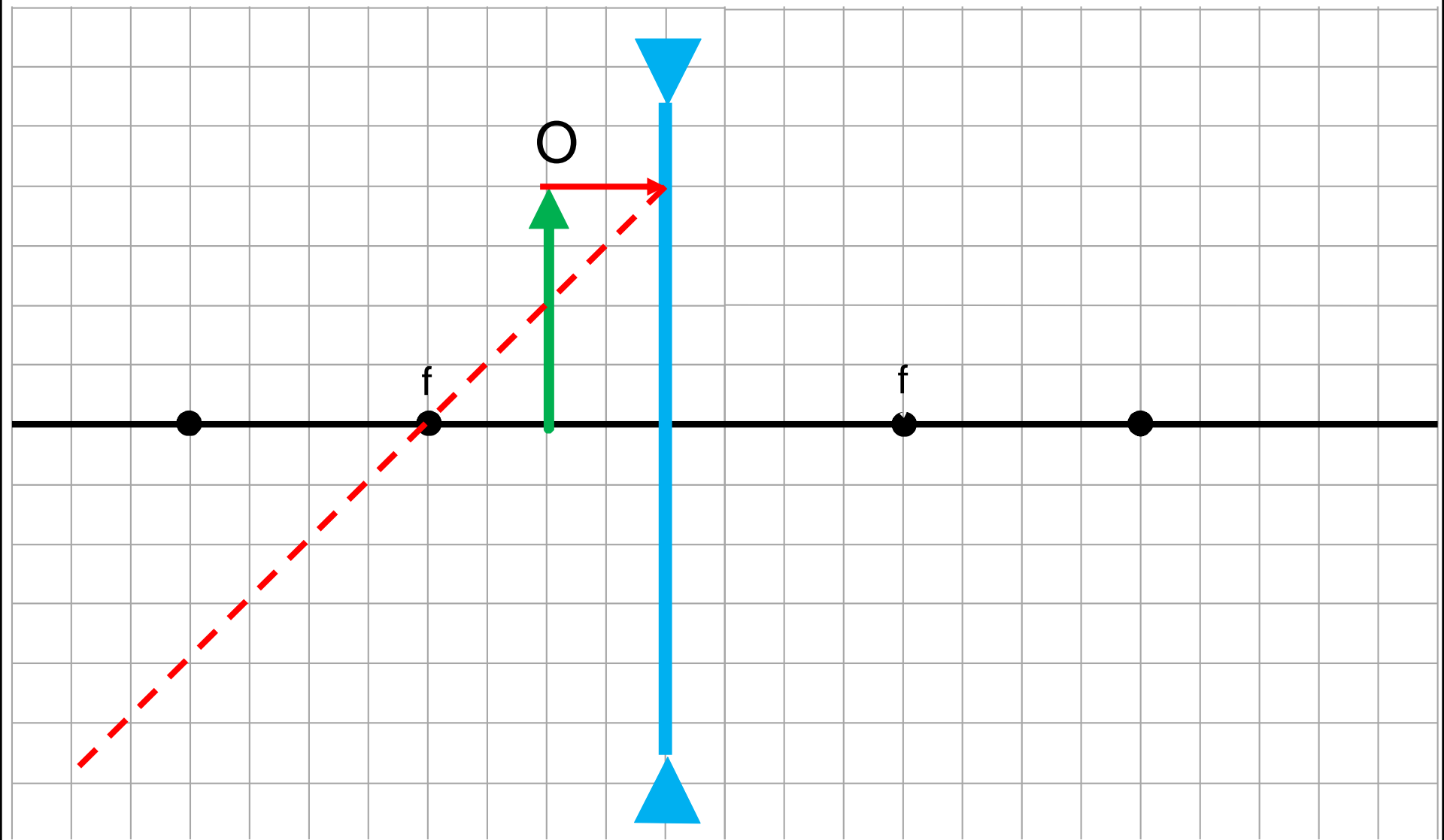


Figura 7: Objeto entre o vértice e o foco

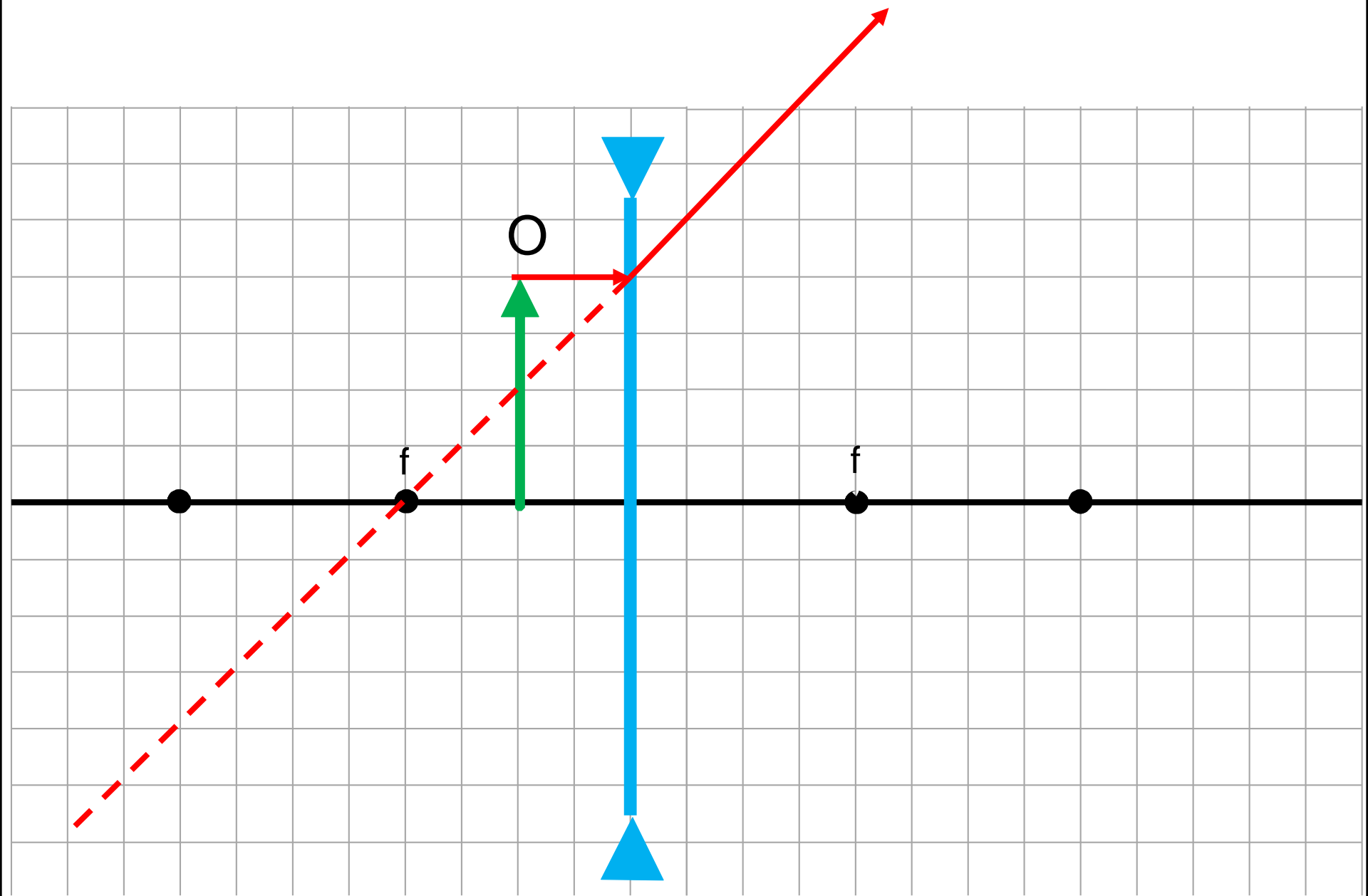


Figura 7: Objeto entre o vértice e o foco

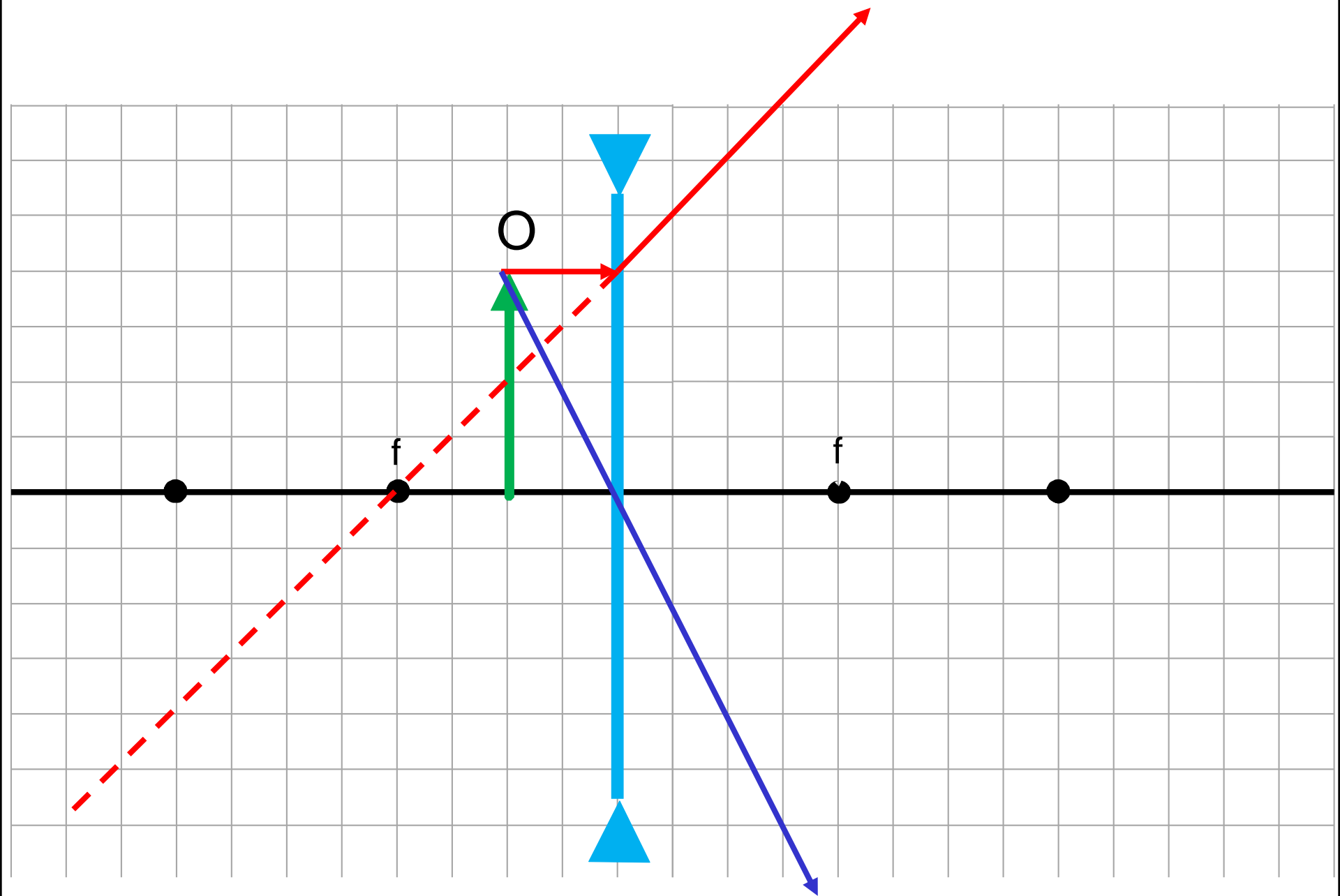


Figura 7: Objeto entre o vértice e o foco



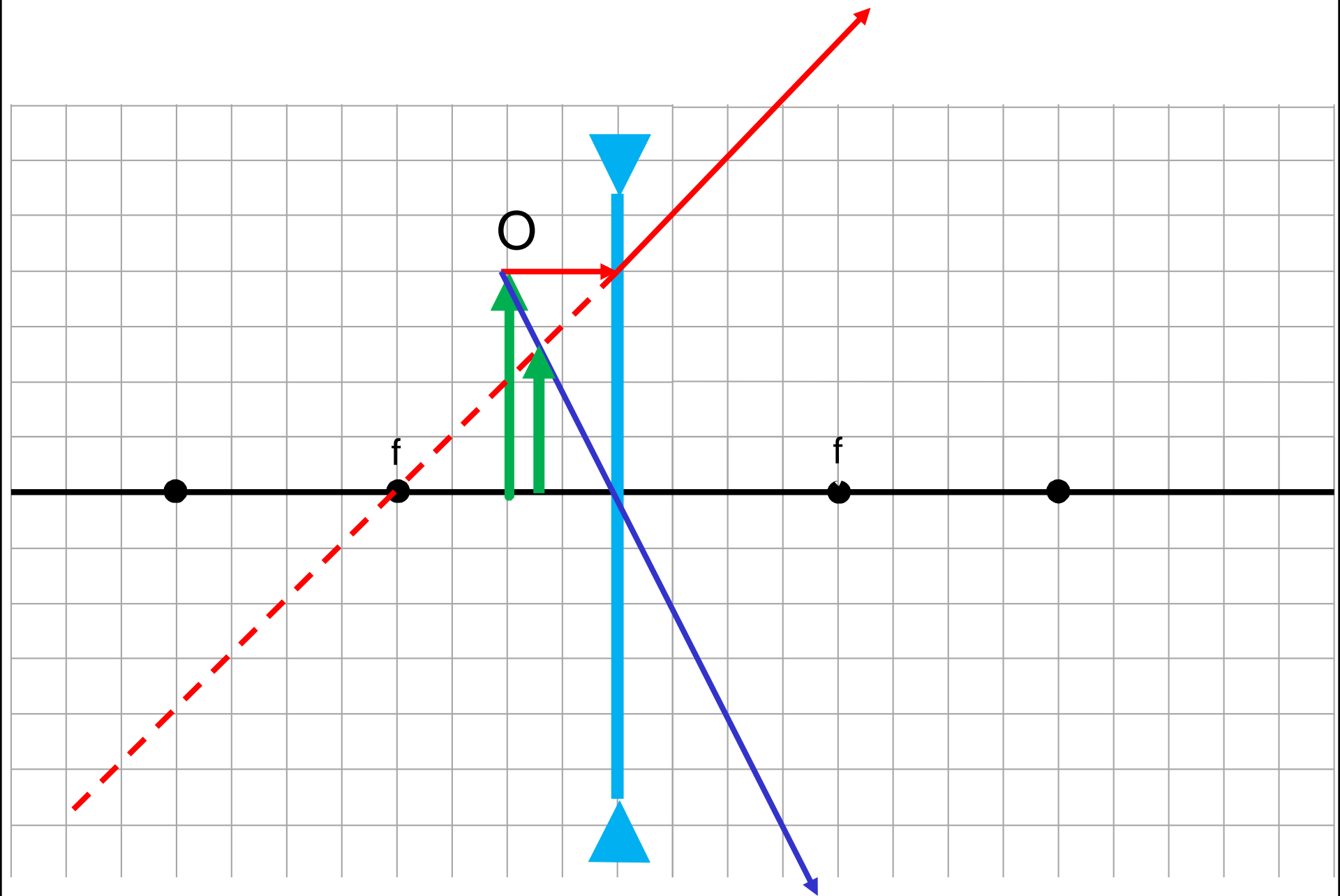


Figura 7: Objeto entre o vértice e o foco

CLASSIFICAÇÃO:

Imagem

VIRTUAL  
DIREITA  
MENOR

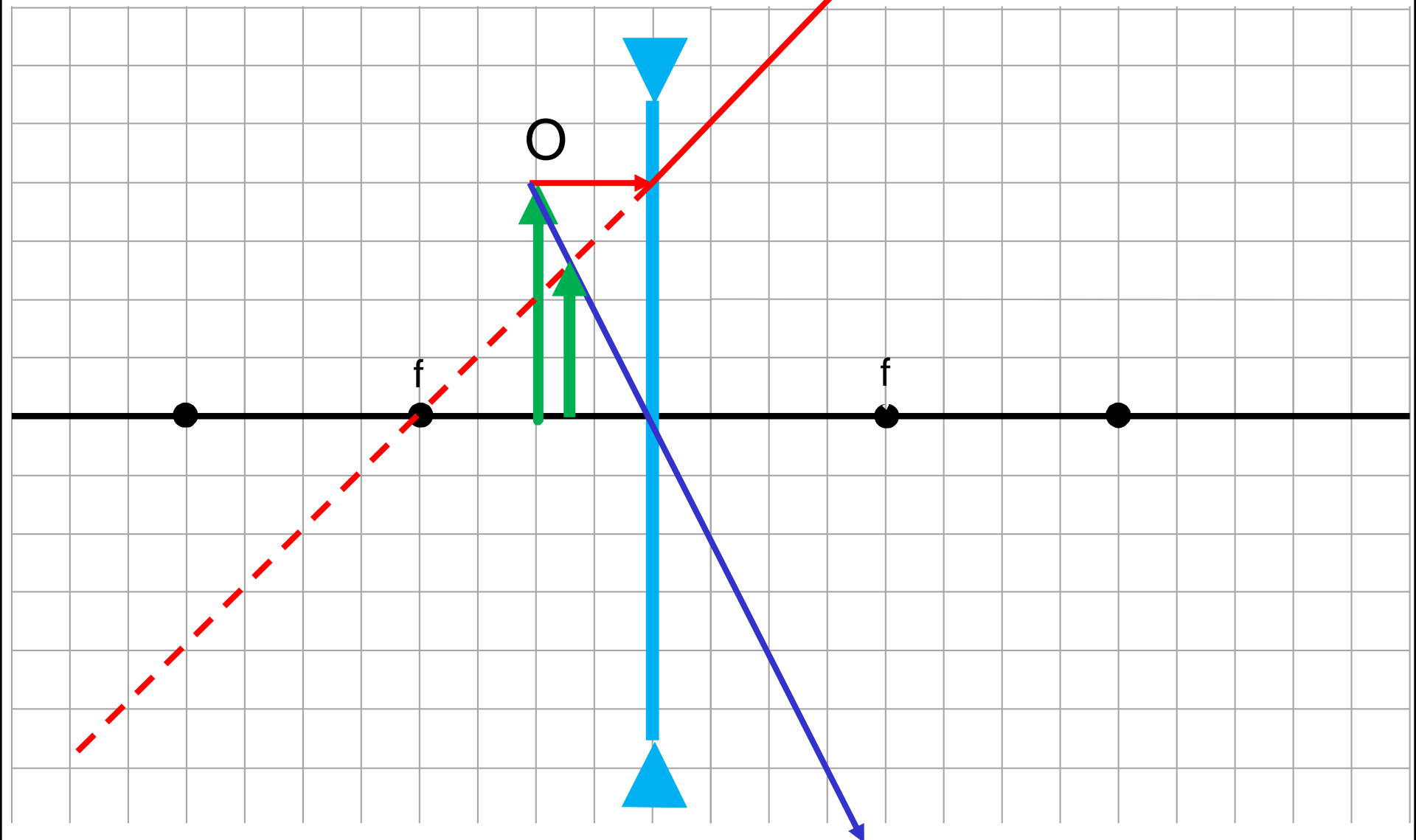


Figura 7: Objeto entre o vértice e o foco



# Segundo caso

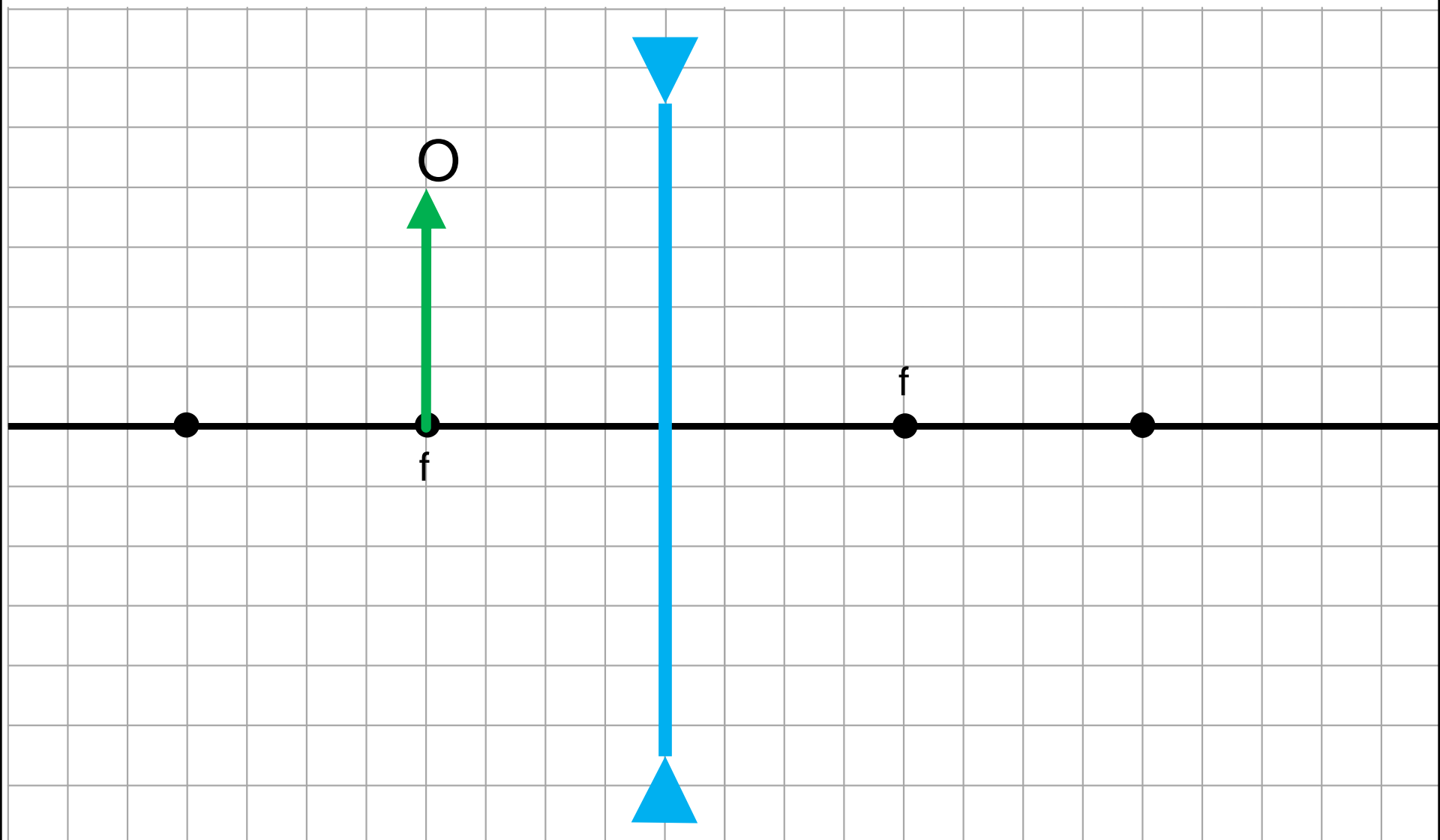


Figura 8: Objeto no foco

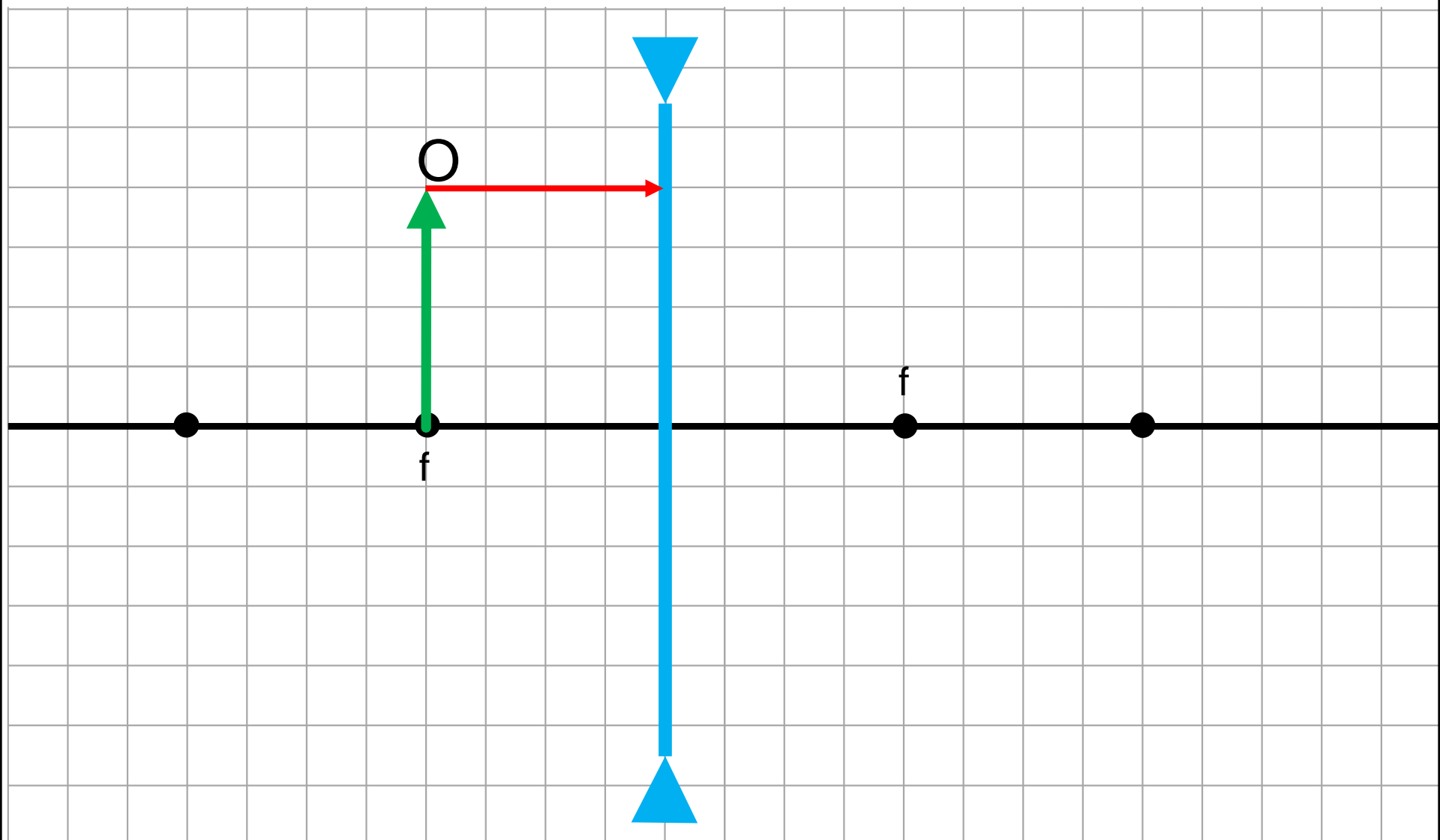


Figura 8: Objeto no foco

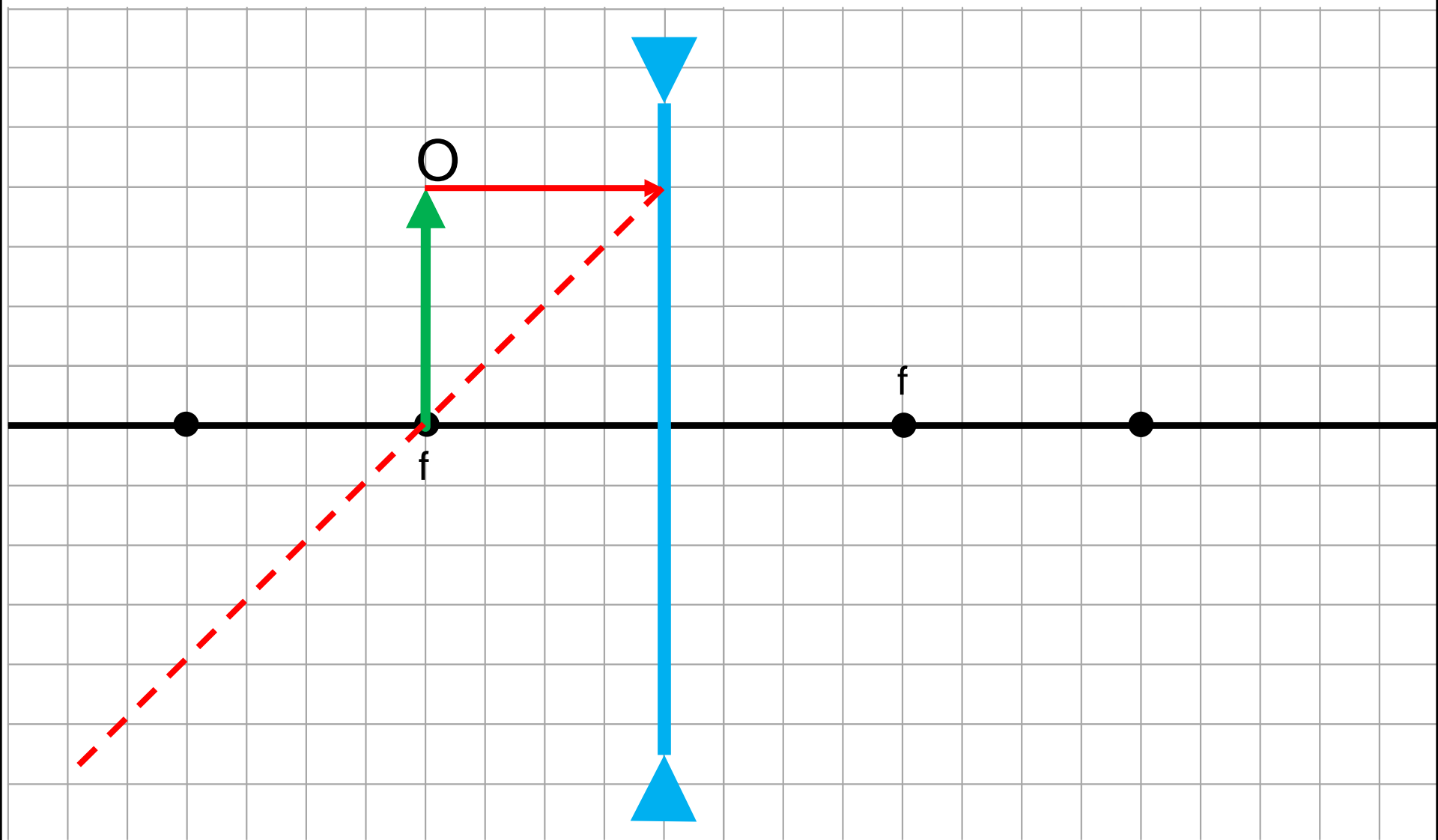


Figura 8: Objeto no foco

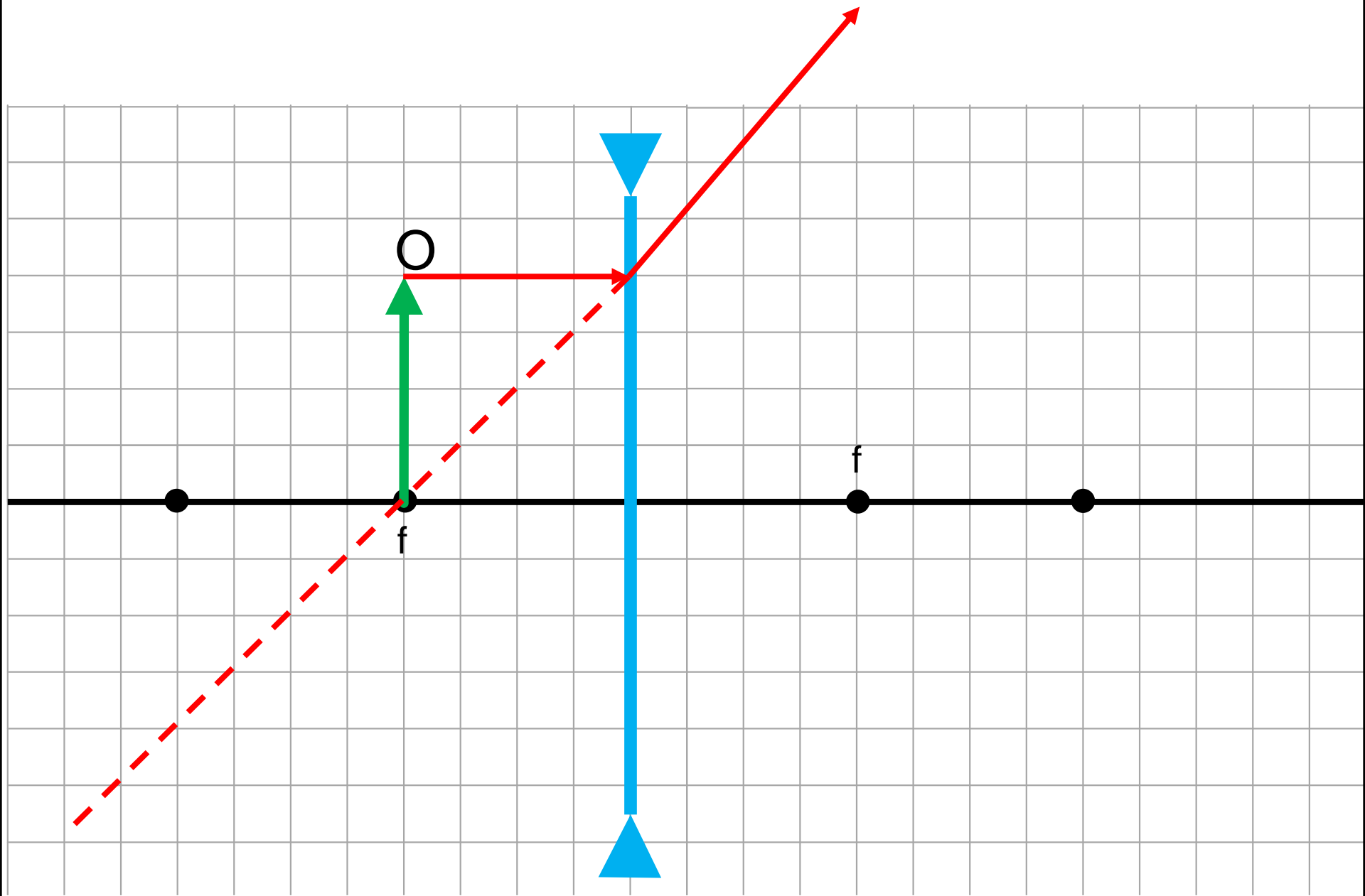


Figura 8: Objeto no foco

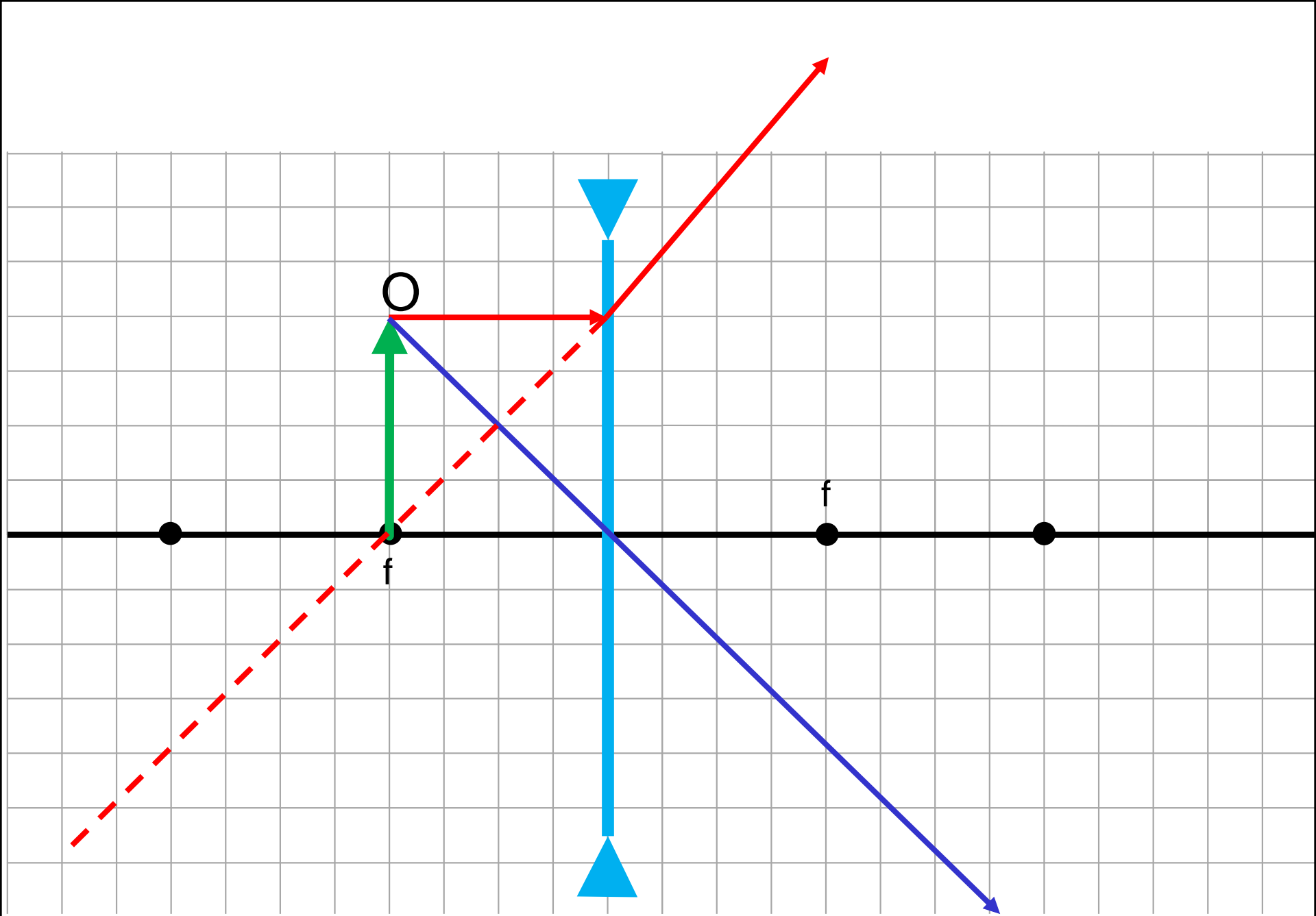


Figura 8: Objeto no foco



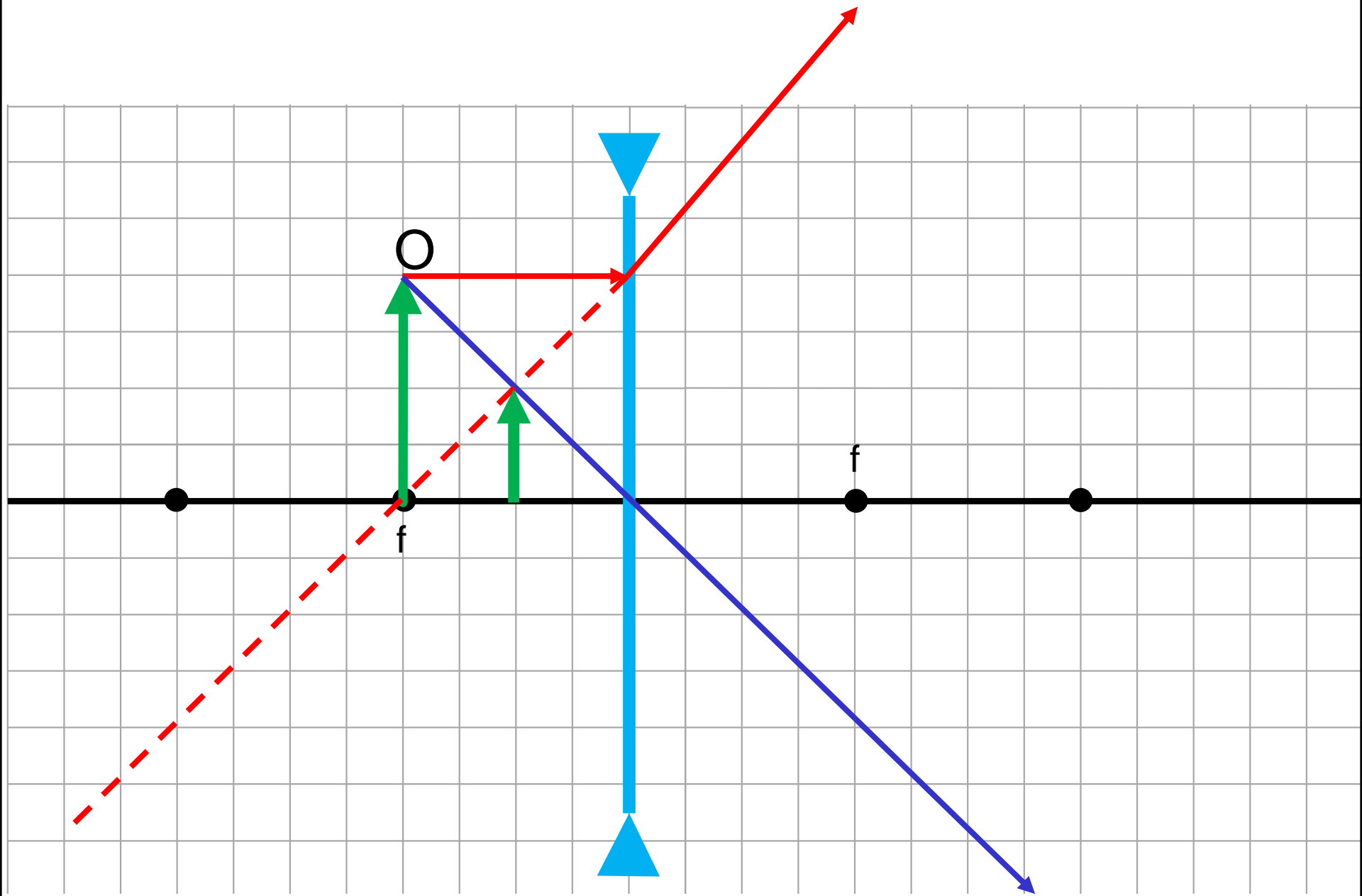


Figura 8: Objeto no foco

CLASSIFICAÇÃO:

Imagem

VIRTUAL

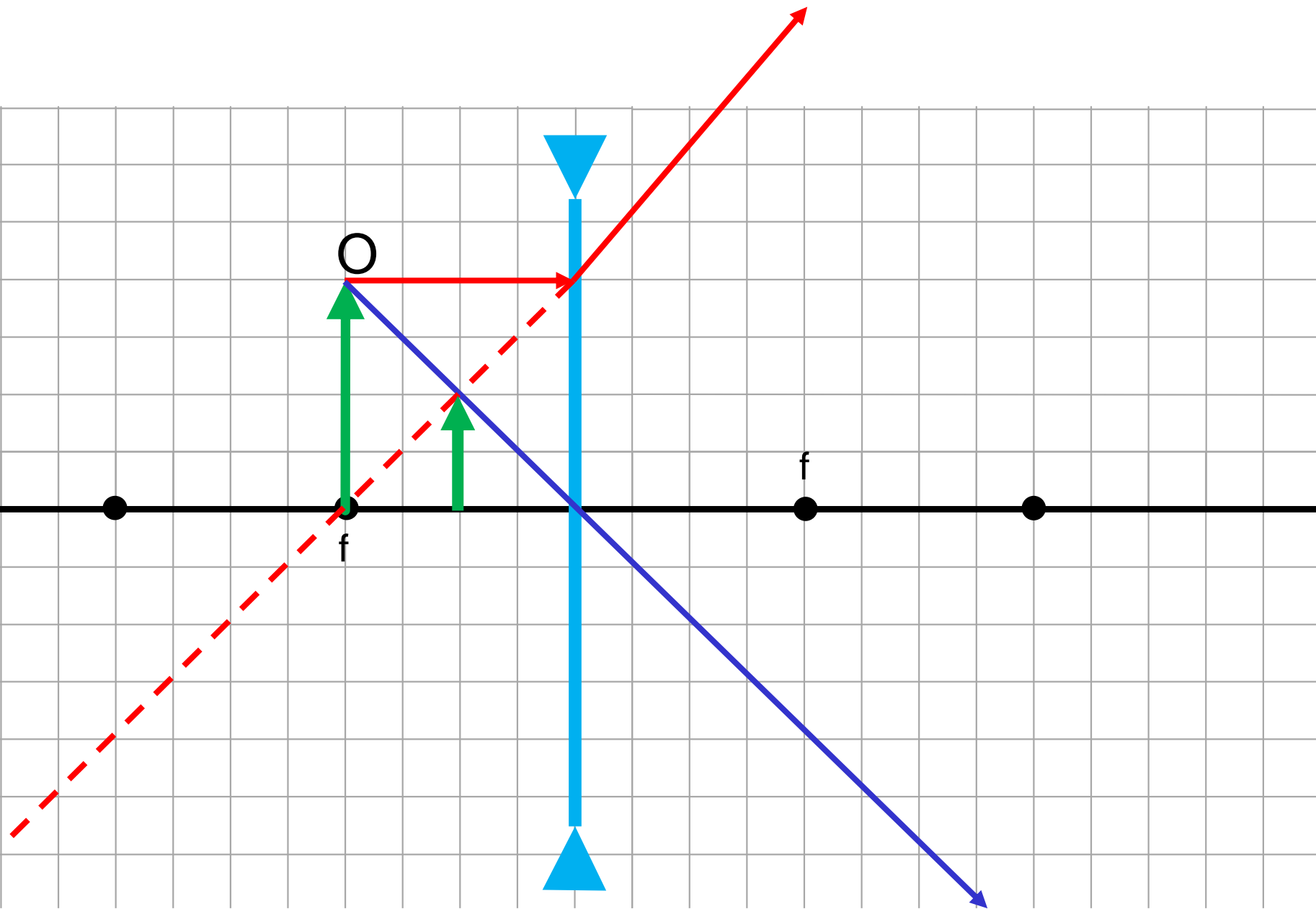


Figura 8: Objeto no foco

CLASSIFICAÇÃO:

Imagem

VIRTUAL  
DIREITA

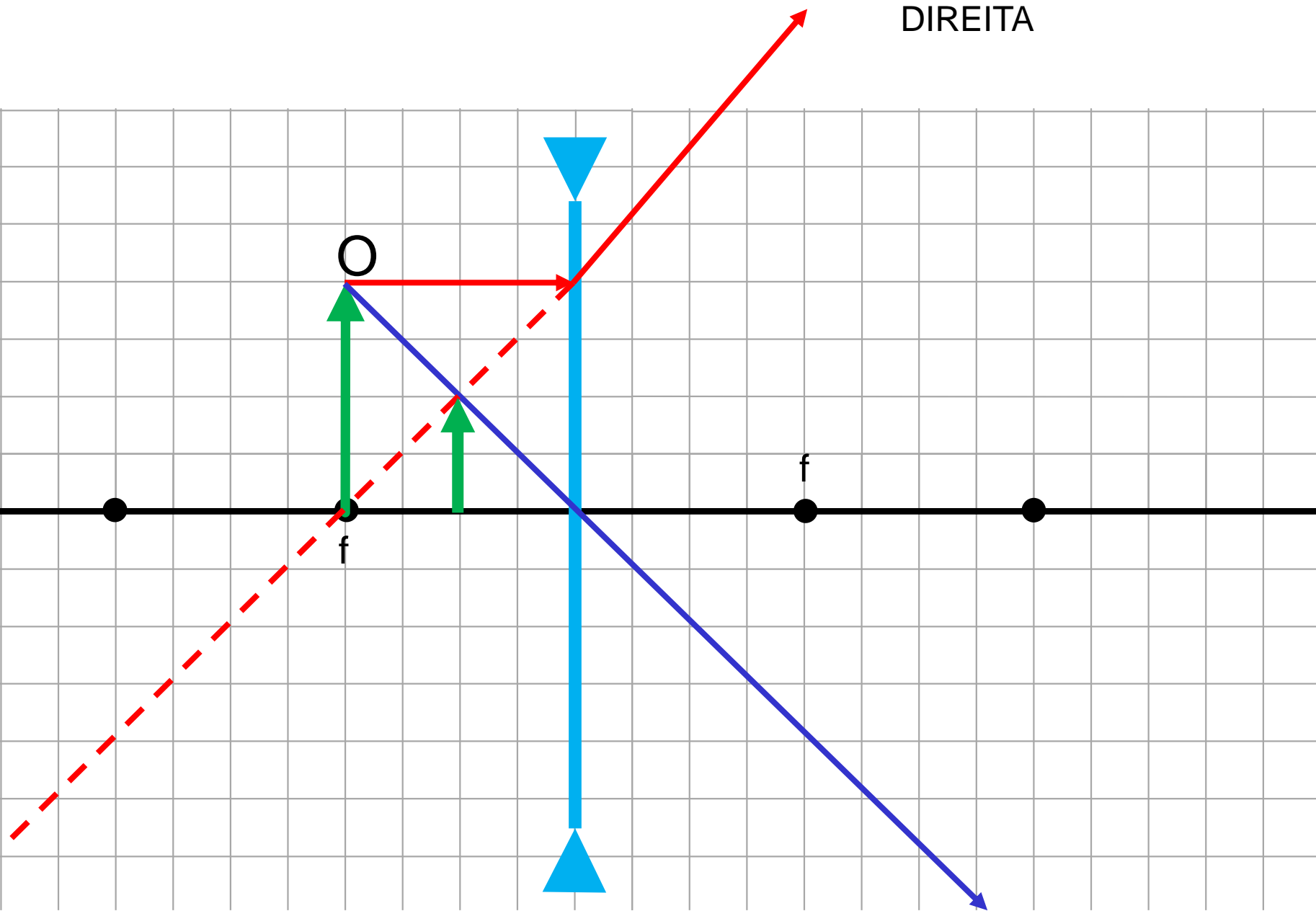


Figura 8: Objeto no foco

CLASSIFICAÇÃO:

Imagem

VIRTUAL  
DIREITA  
MENOR

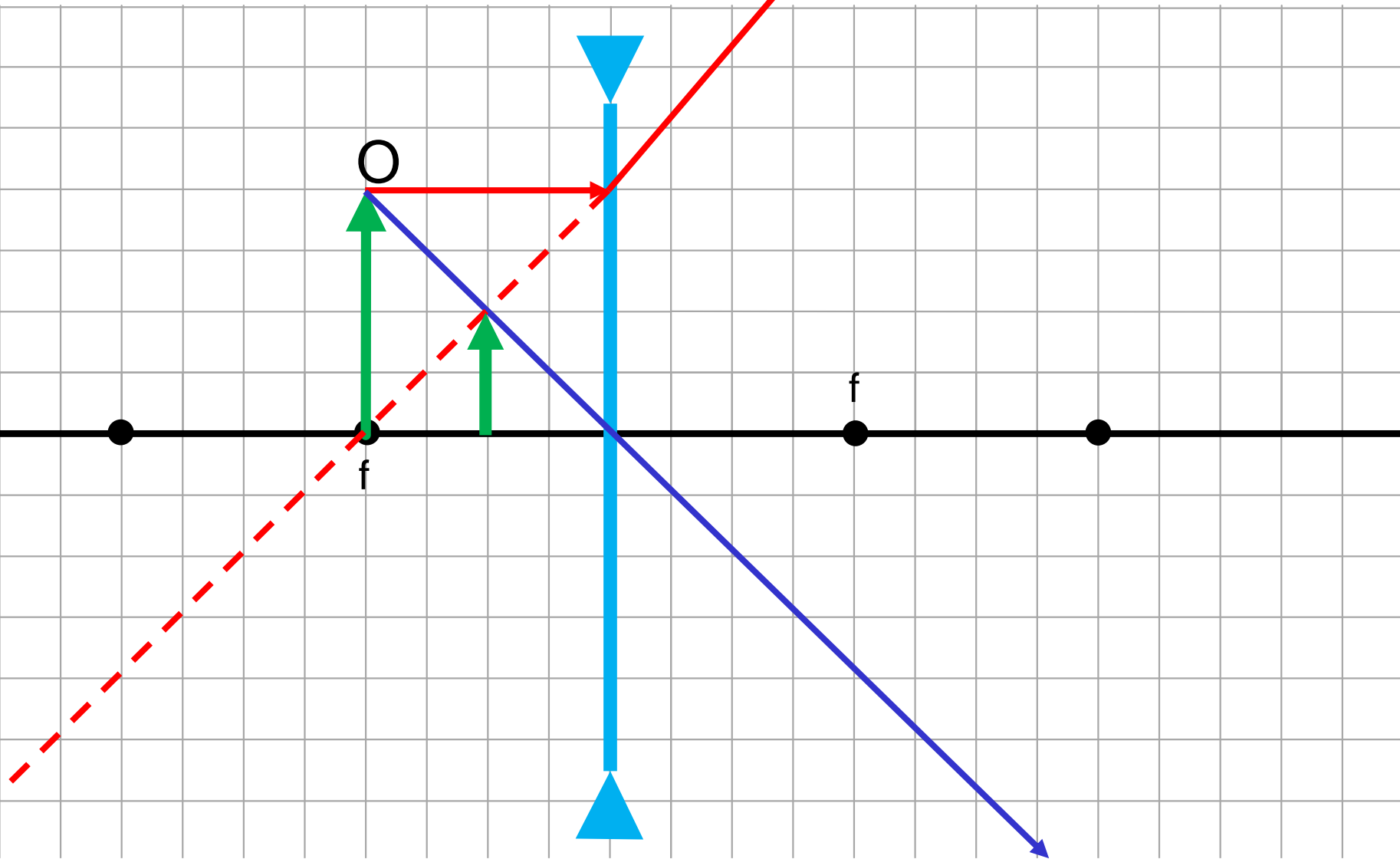


Figura 8: Objeto no foco



Terceiro caso

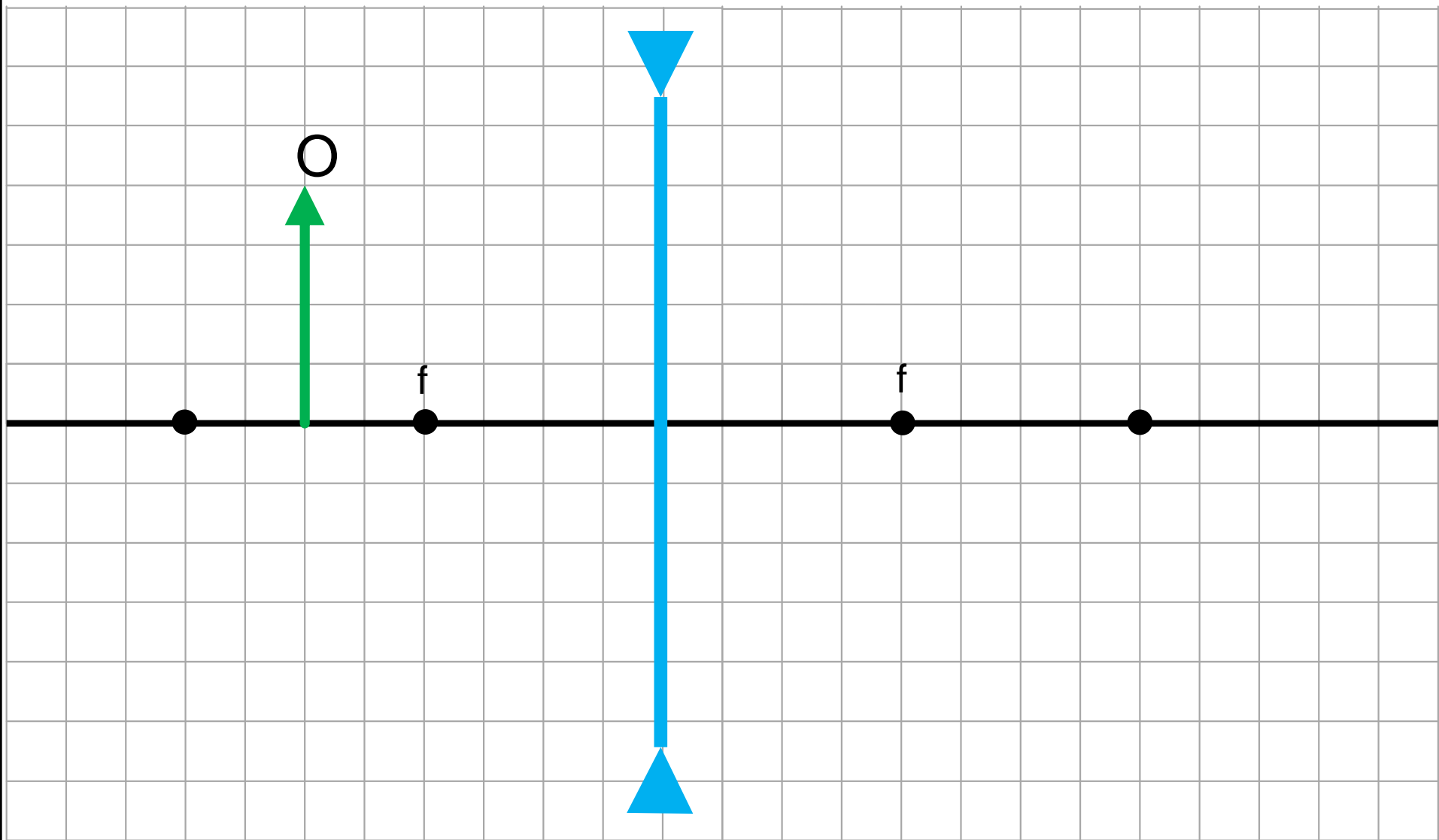


Figura 9: Objeto entre o foco e o anti-principal

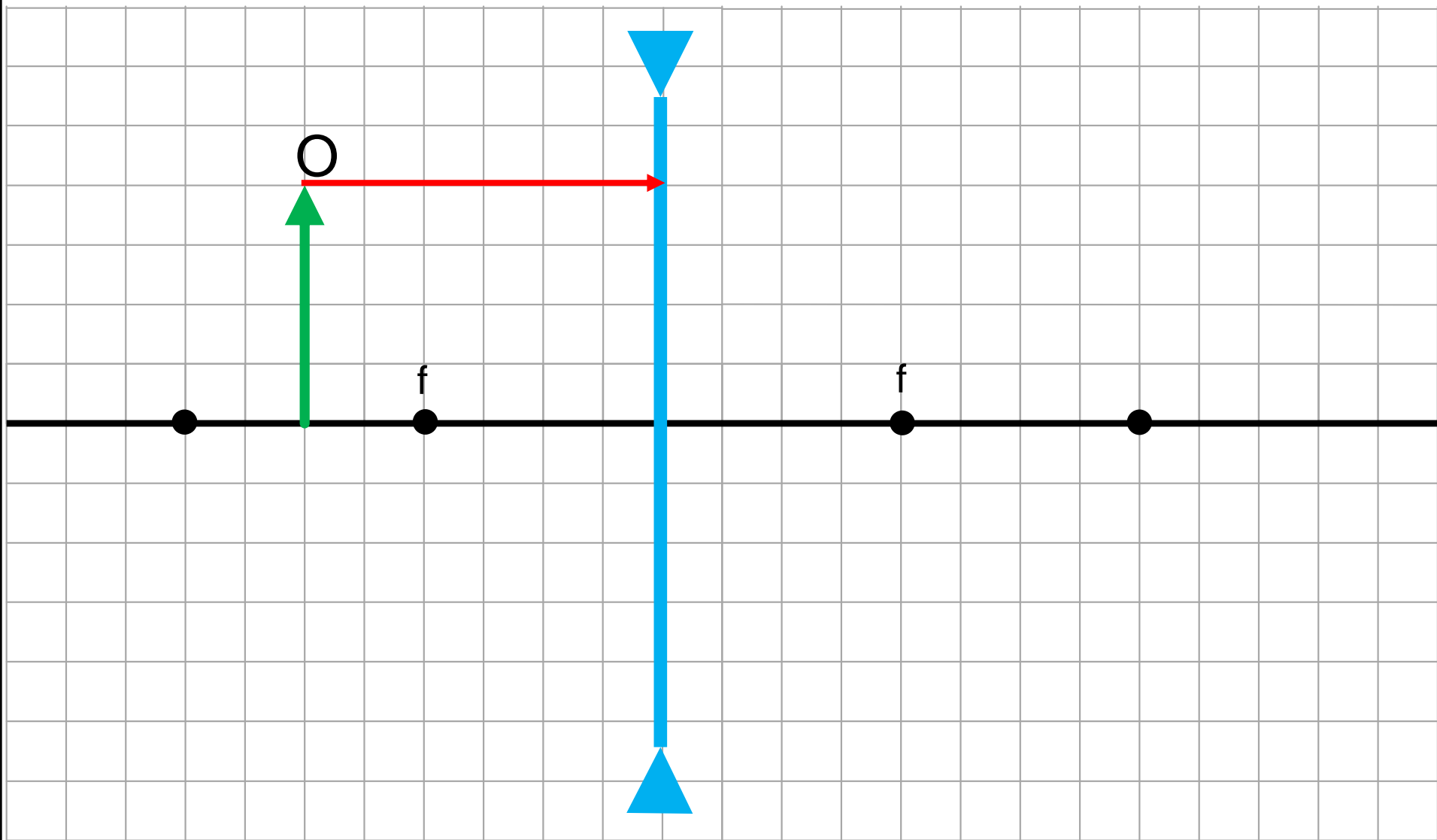


Figura 9: Objeto entre o foco e o anti-principal

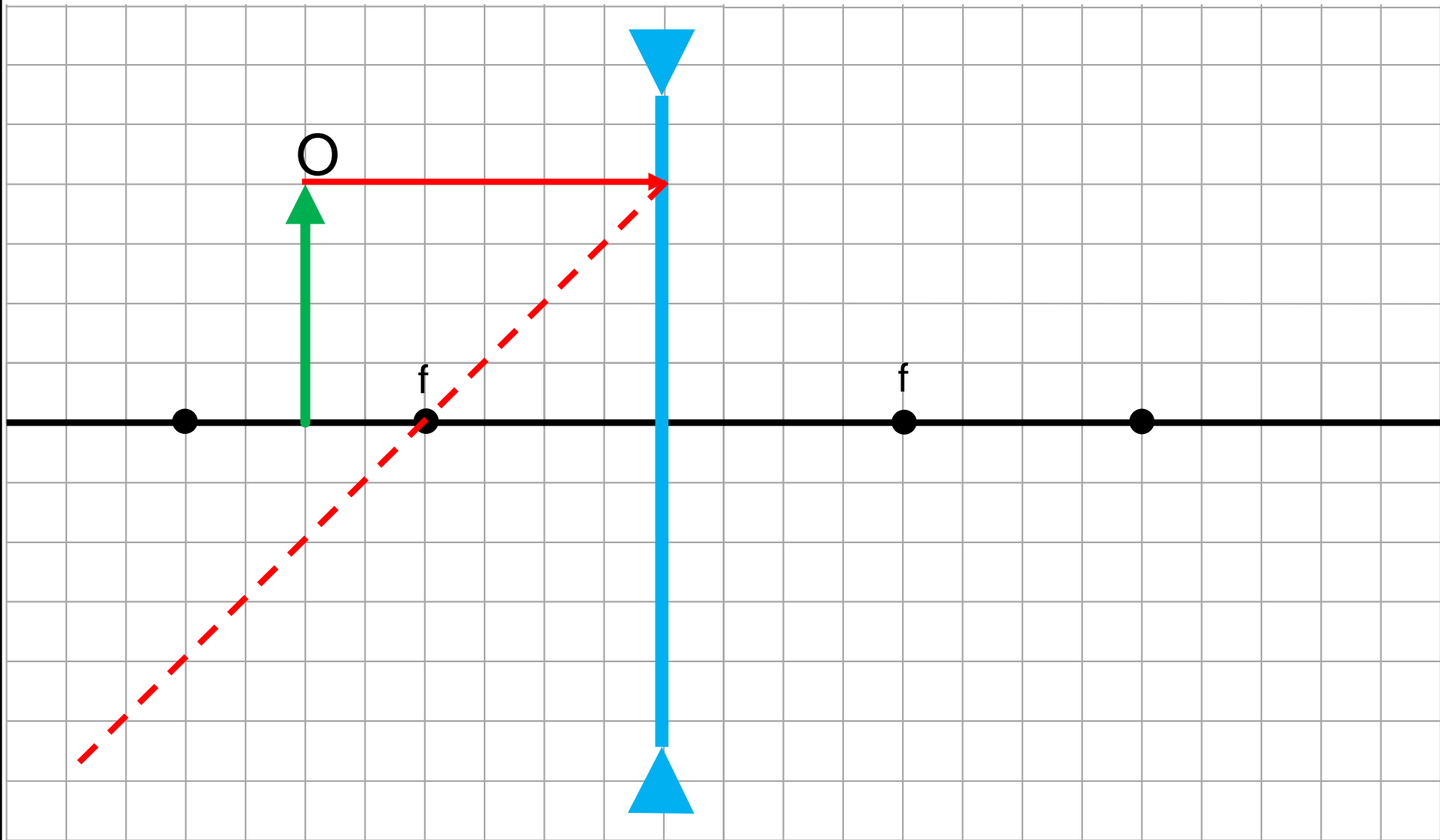


Figura 9: Objeto entre o foco e o anti-principal



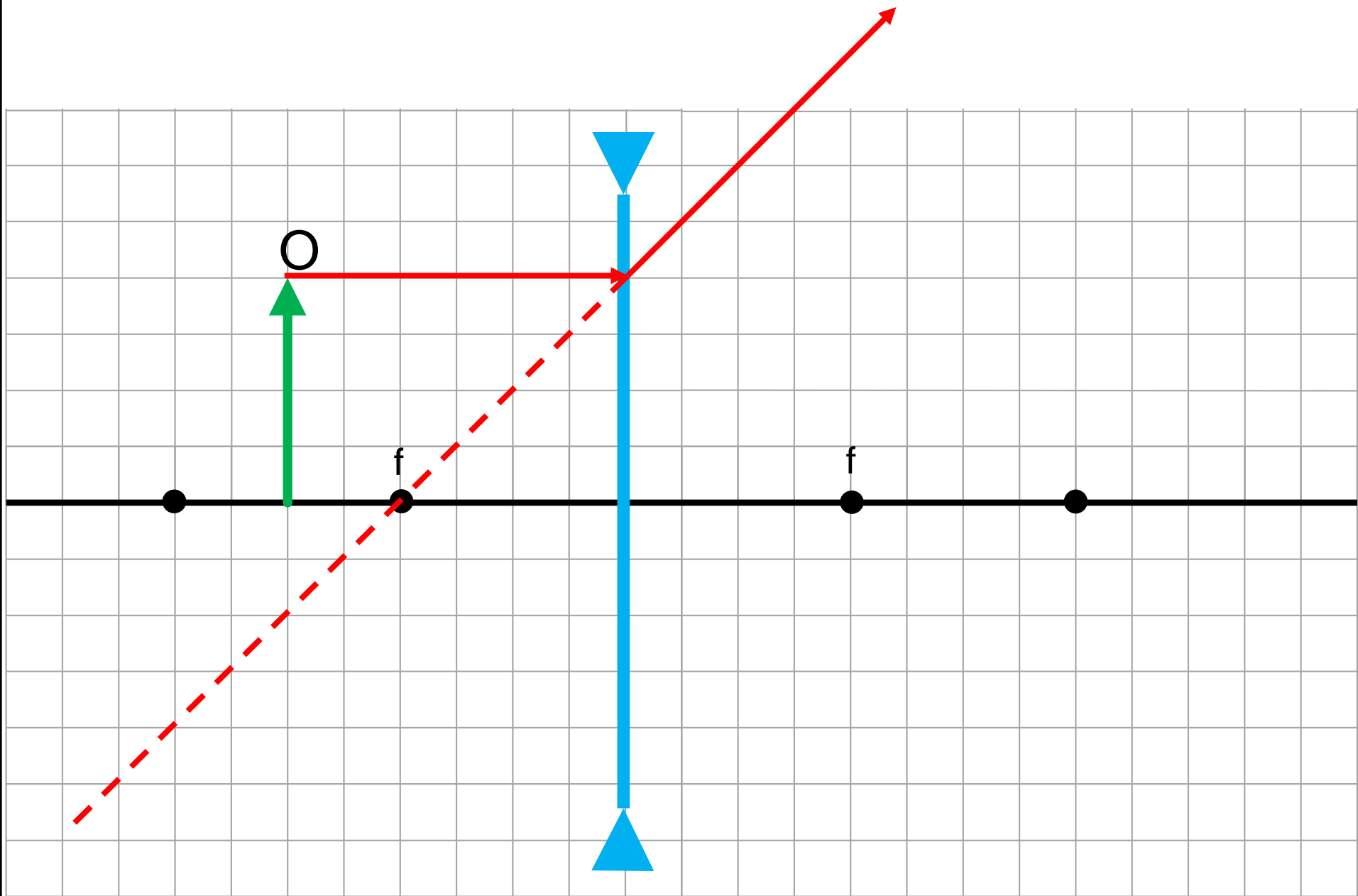


Figura 9: Objeto entre o foco e o anti-principal

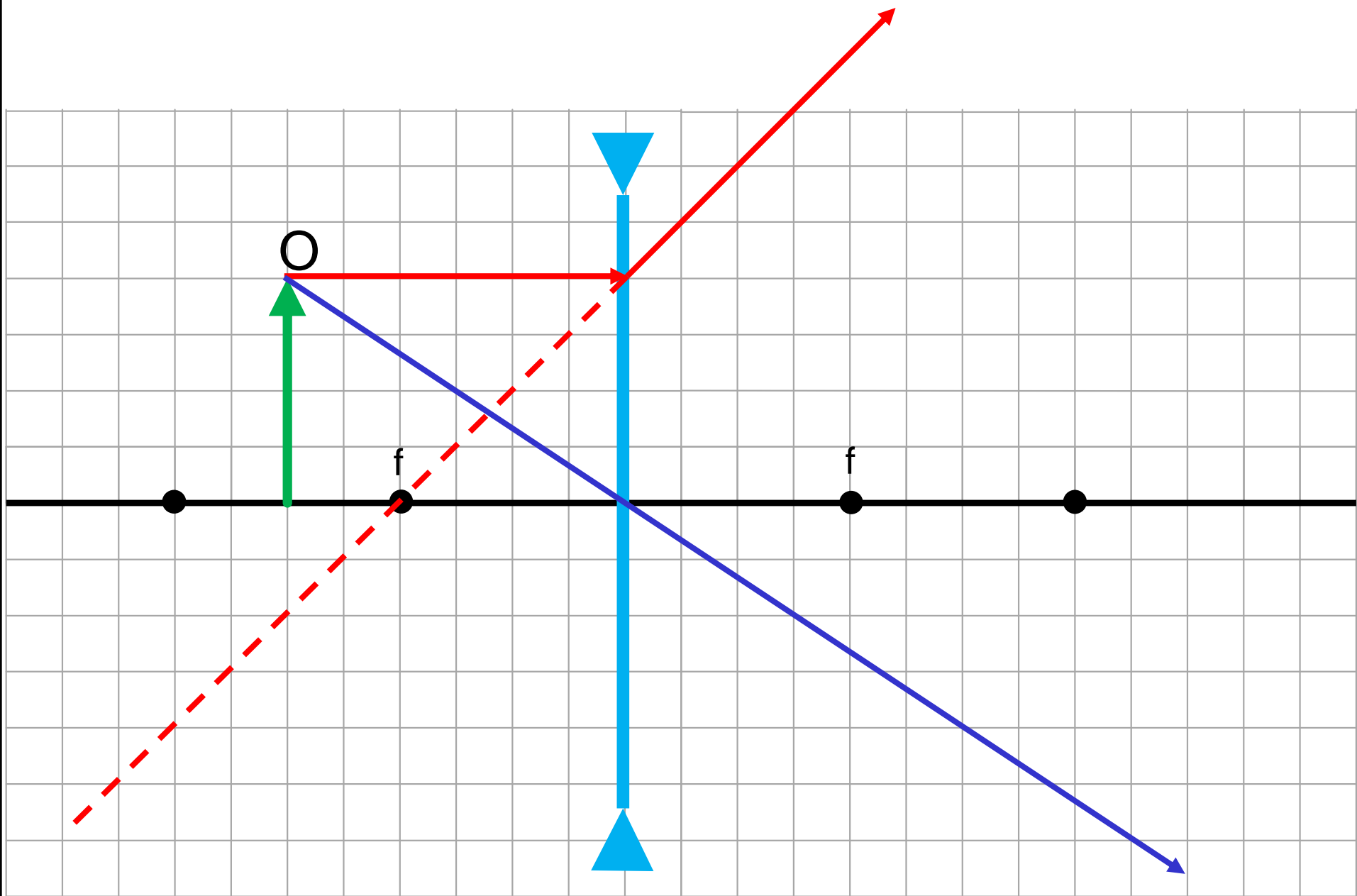


Figura 9: Objeto entre o foco e o anti-principal

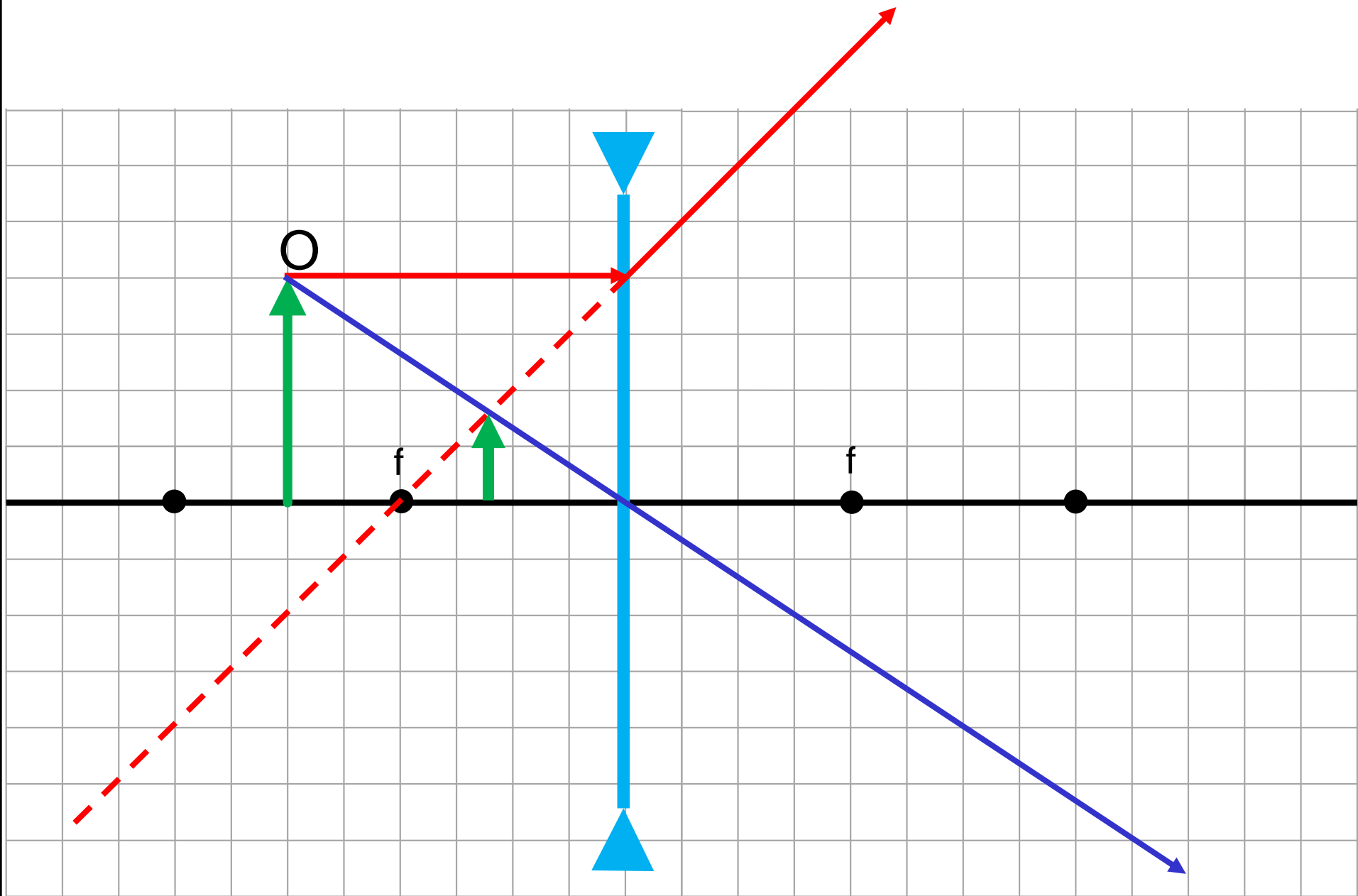


Figura 9: Objeto entre o foco e o anti-principal

CLASSIFICAÇÃO: Imagem VIRTUAL

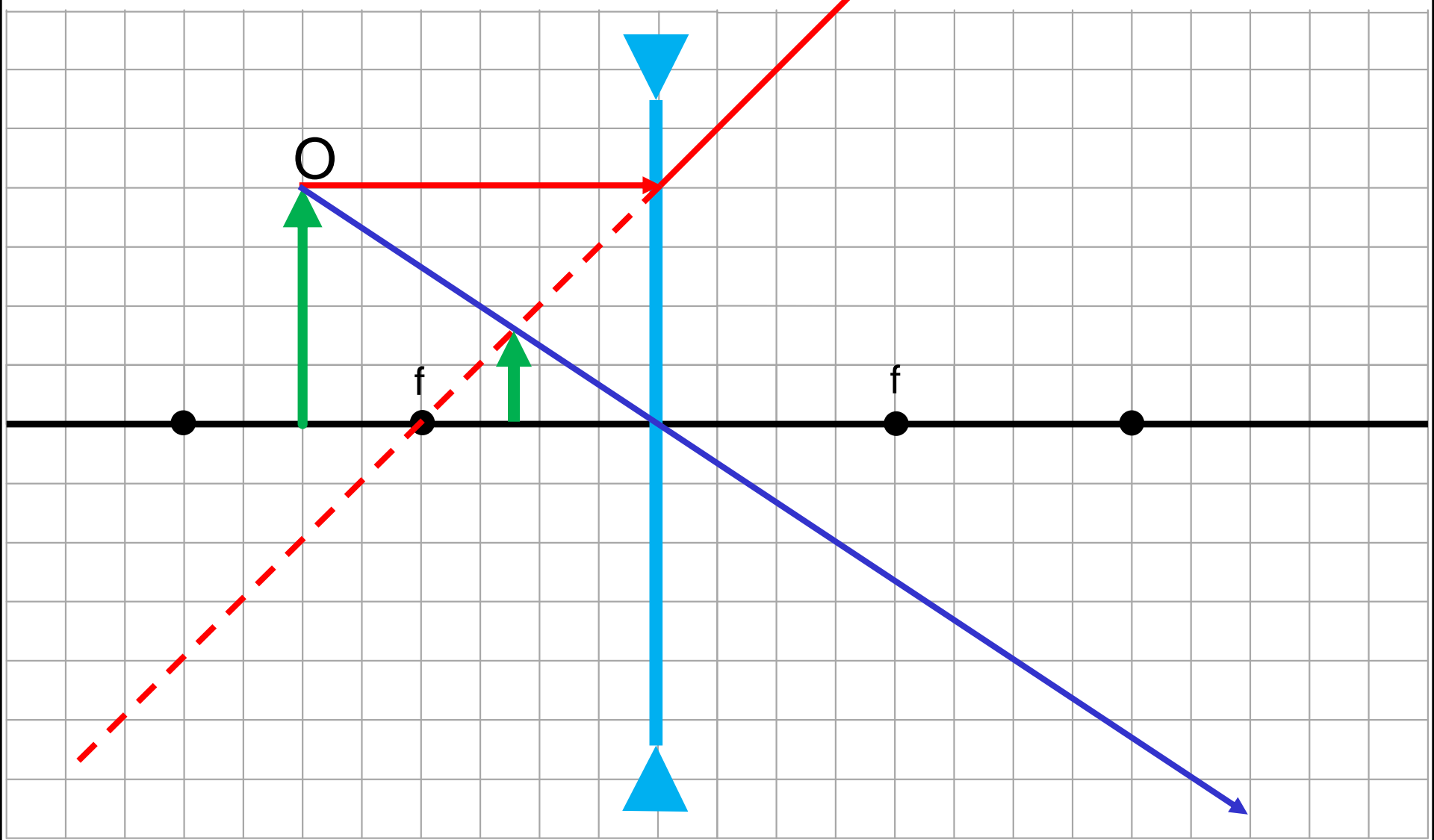


Figura 9: Objeto entre o foco e o anti-principal

CLASSIFICAÇÃO:

Imagem

VIRTUAL  
DIREITA

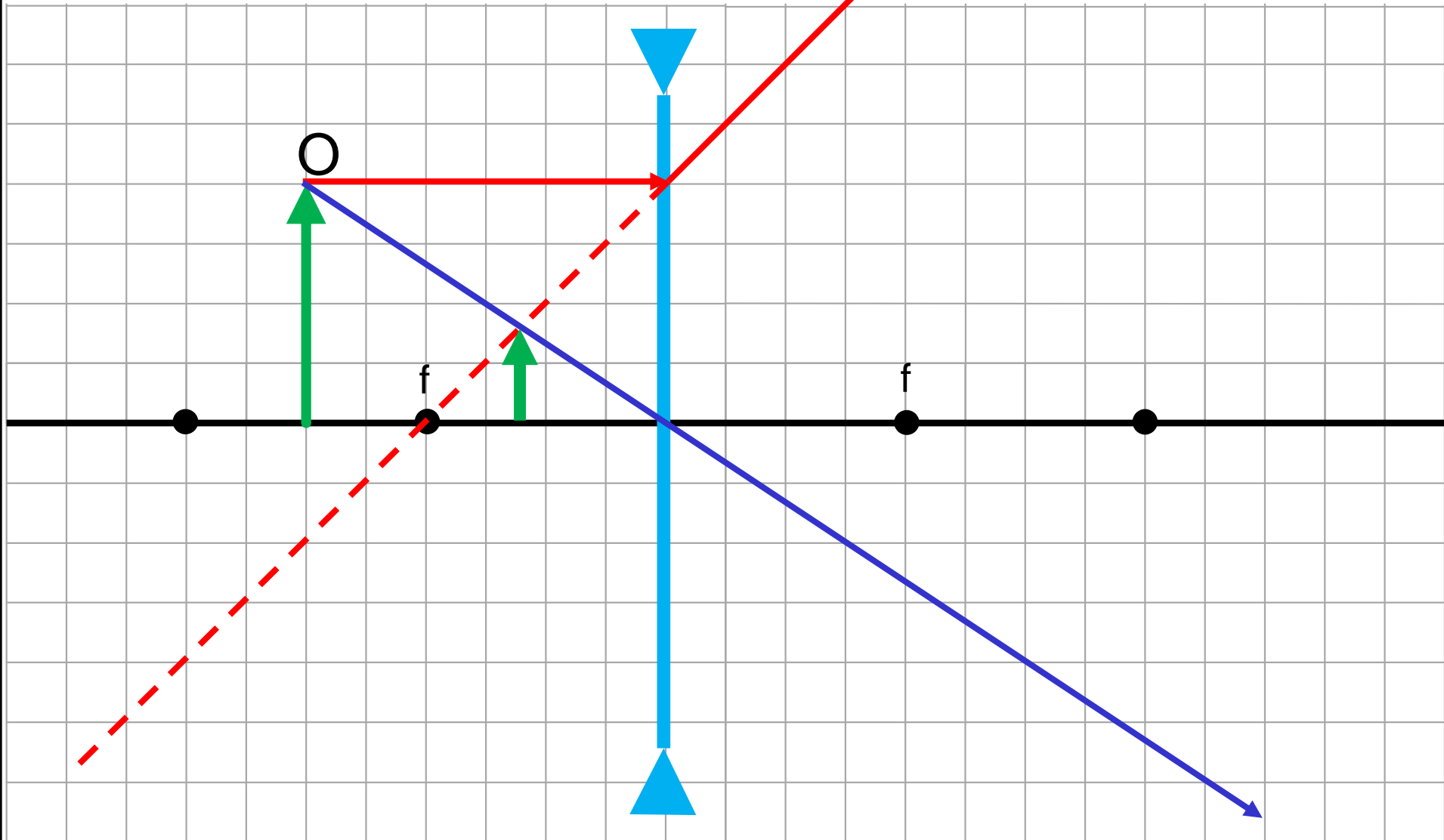


Figura 9: Objeto entre o foco e o anti-principal

CLASSIFICAÇÃO:

Imagem

VIRTUAL  
DIREITA  
MENOR

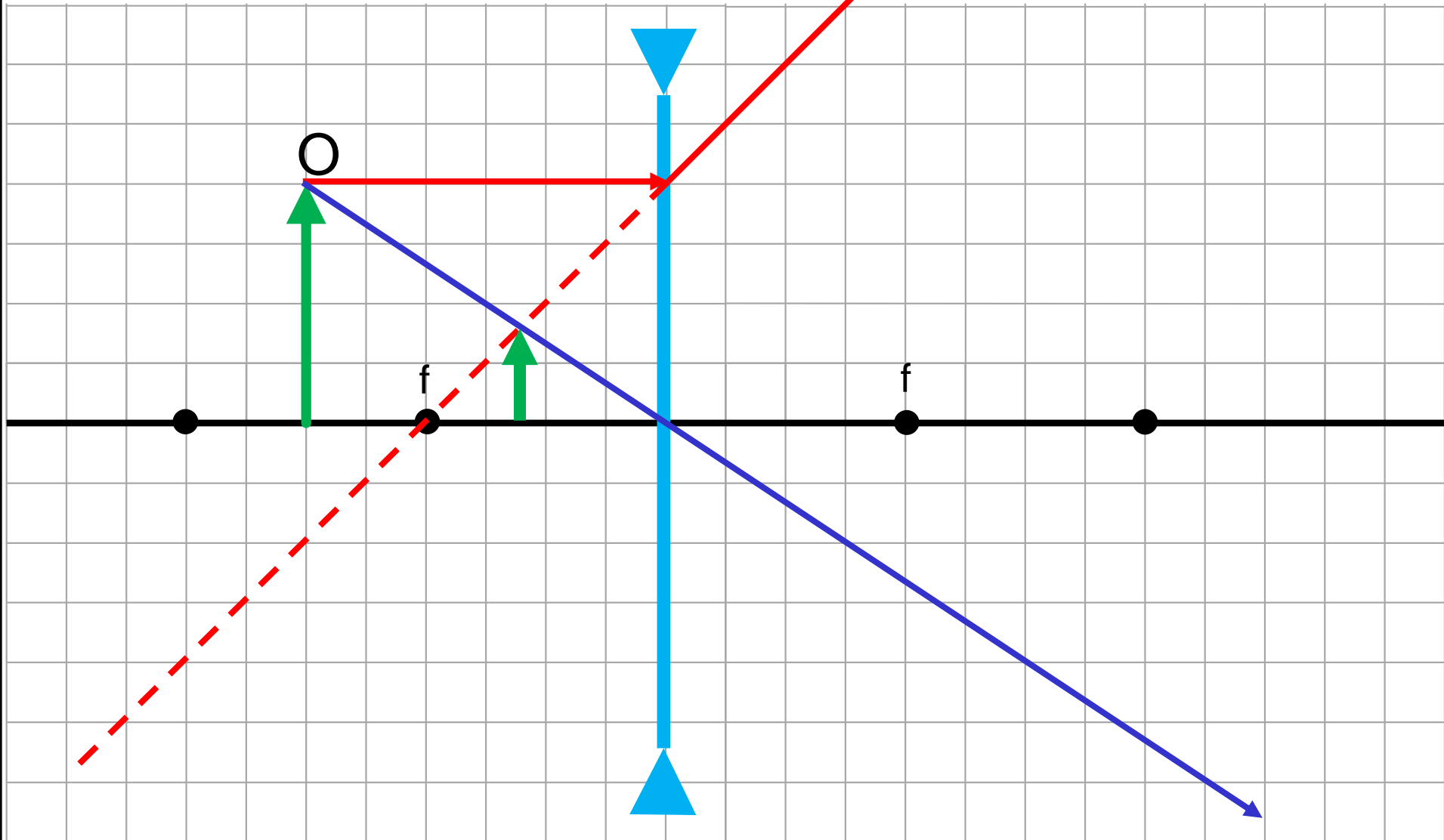


Figura 9: Objeto entre o foco e o anti-principal



Quarto caso

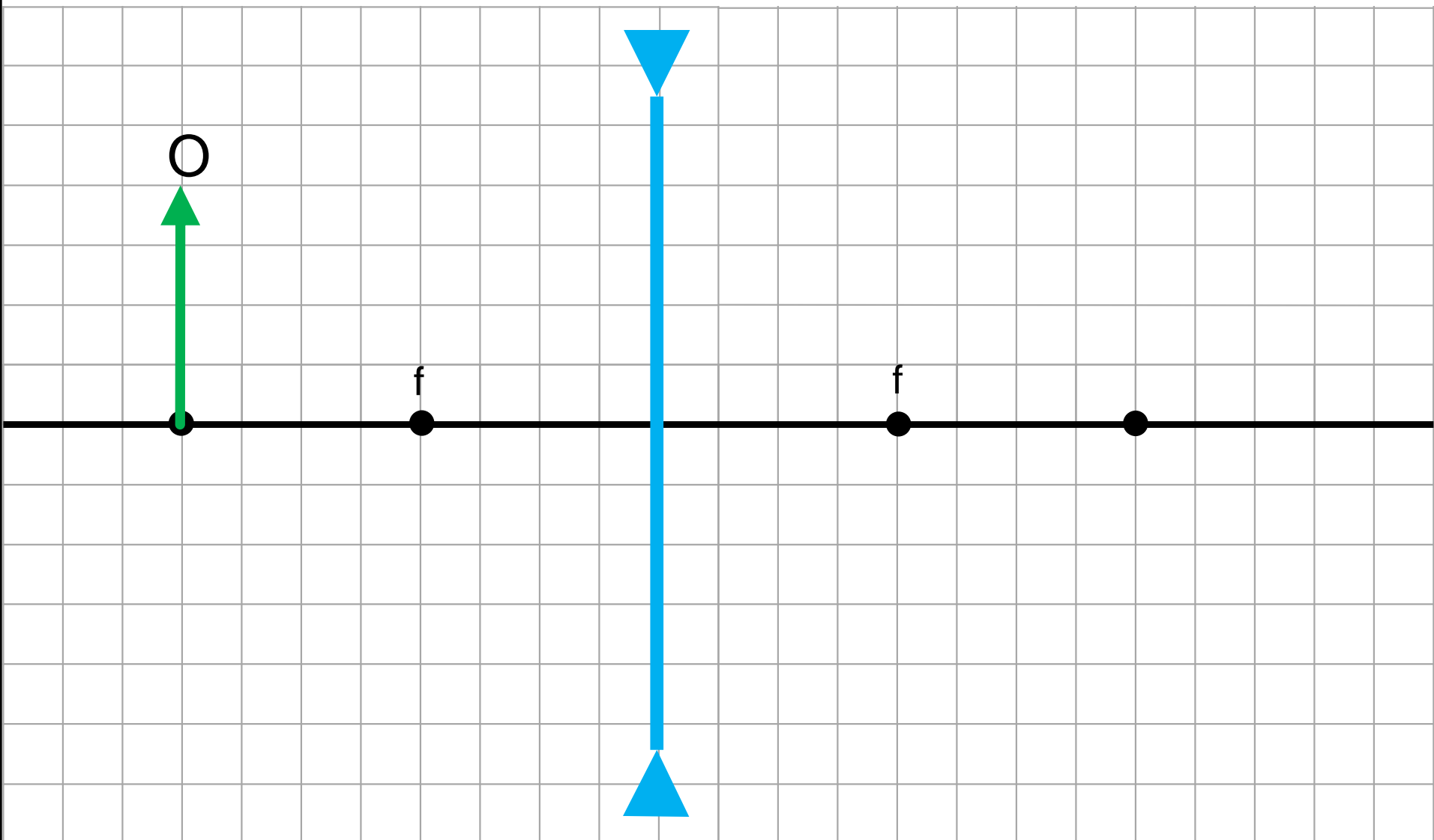


Figura 10: Objeto no anti-principal



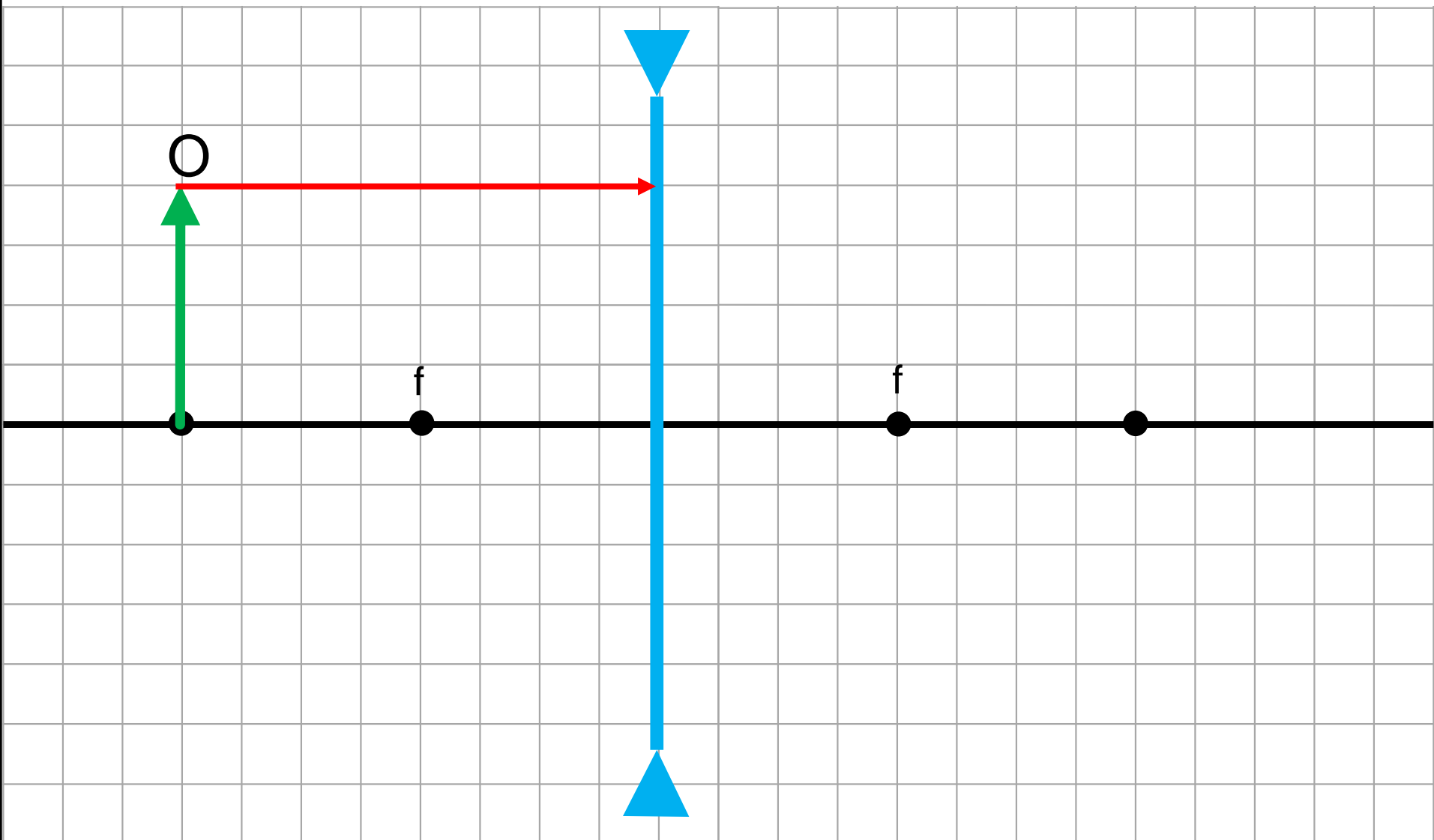


Figura 10: Objeto no anti-principal

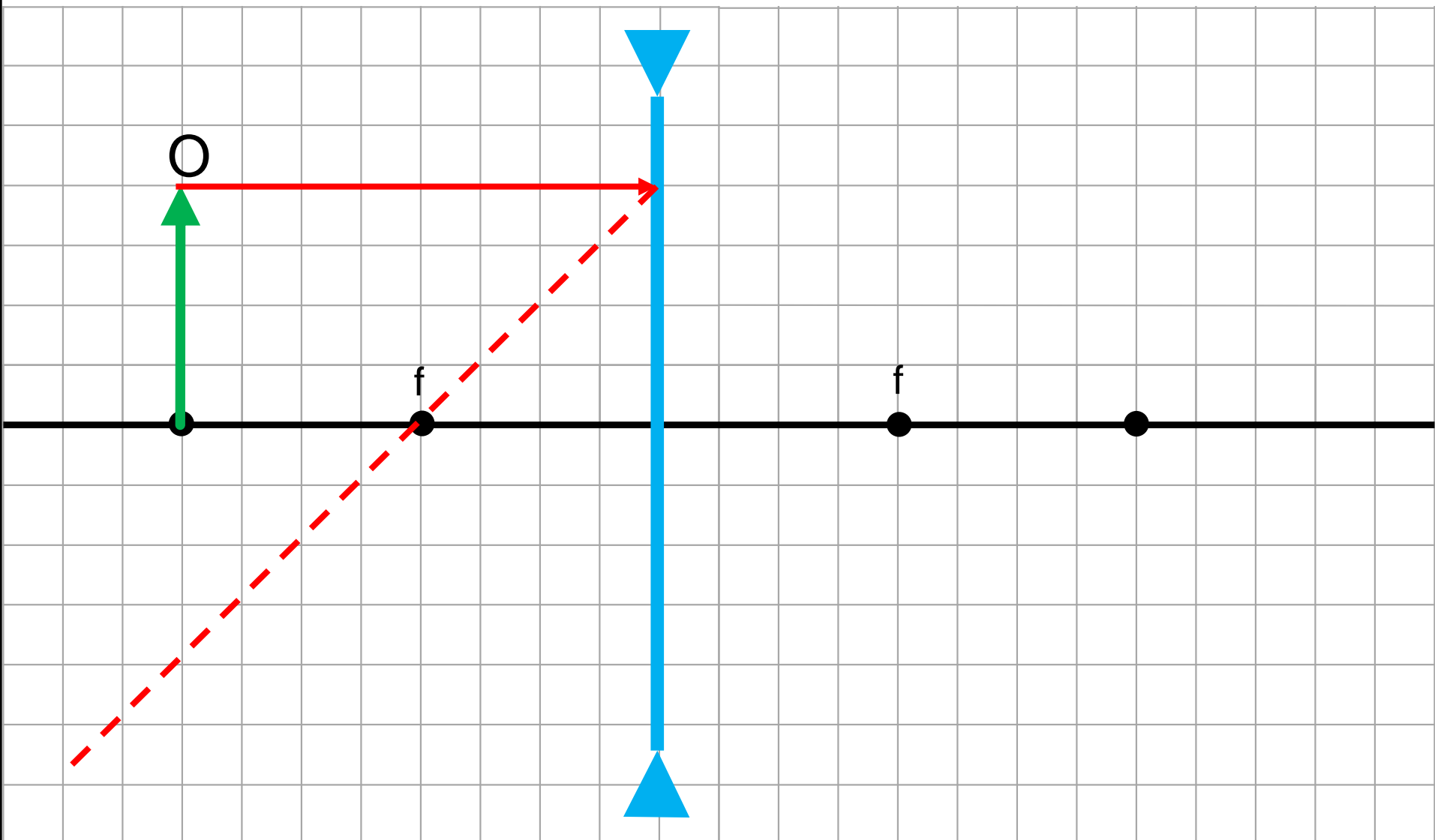


Figura 10: Objeto no anti-principal

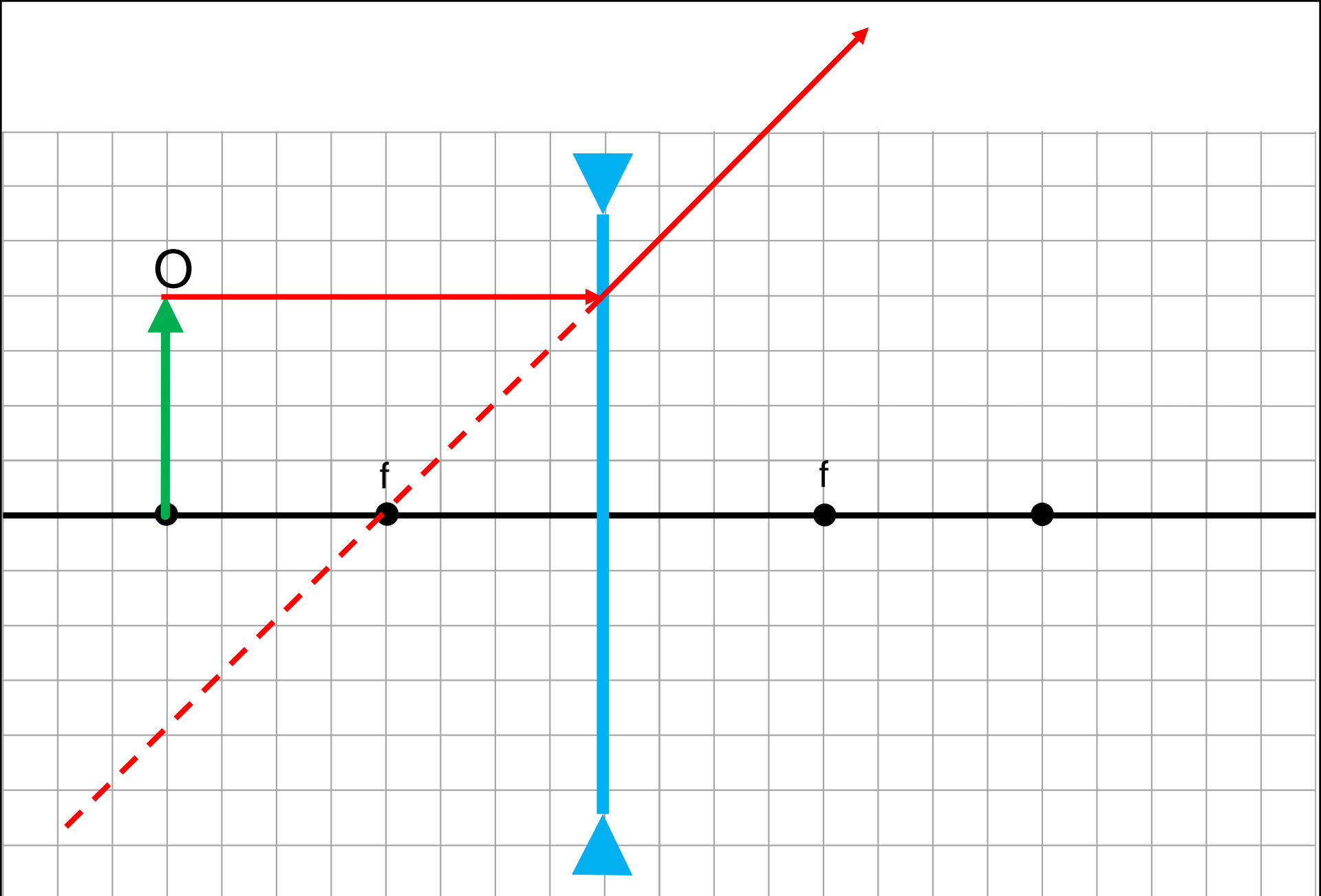


Figura 10: Objeto no anti-principal

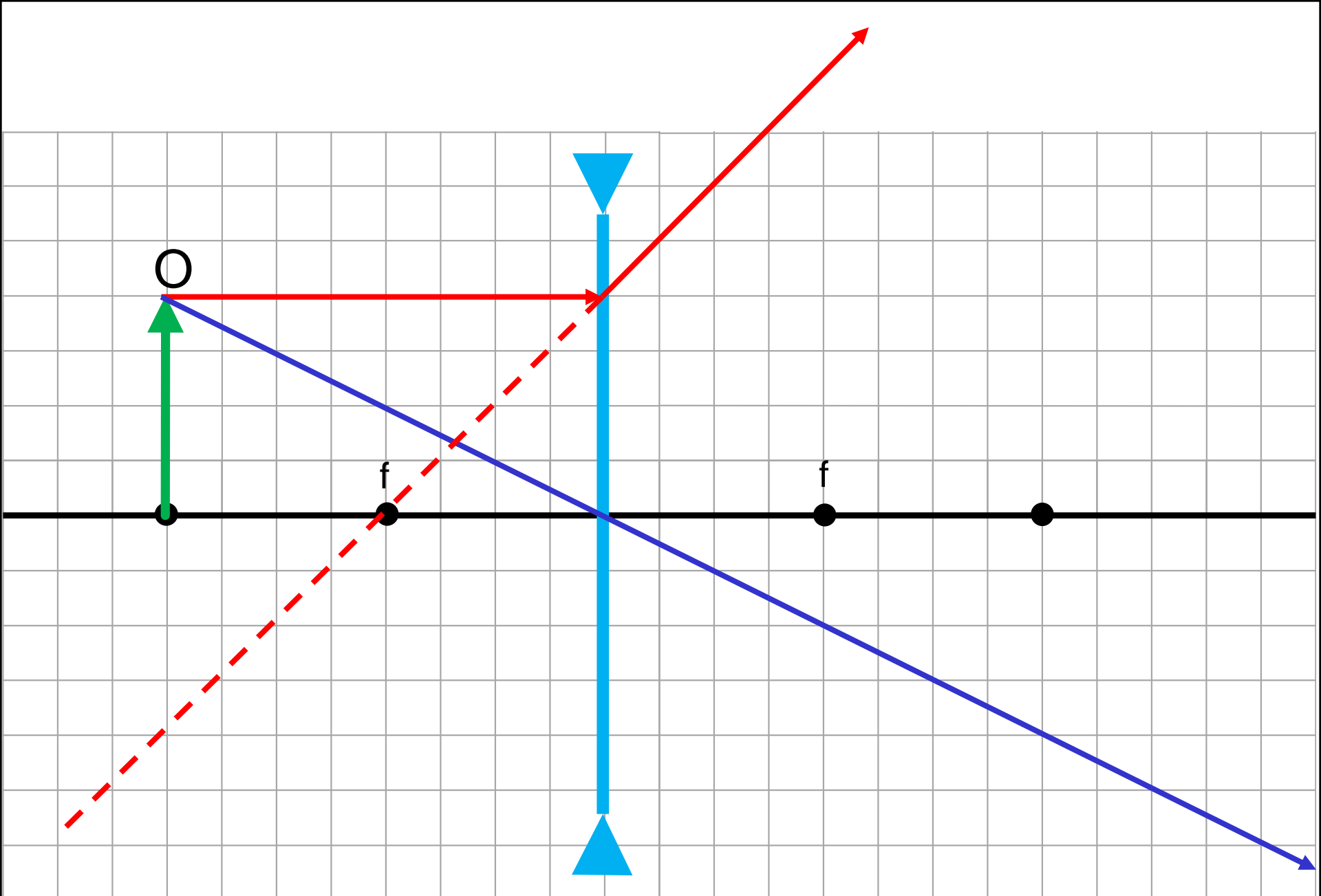


Figura 10: Objeto no anti-principal

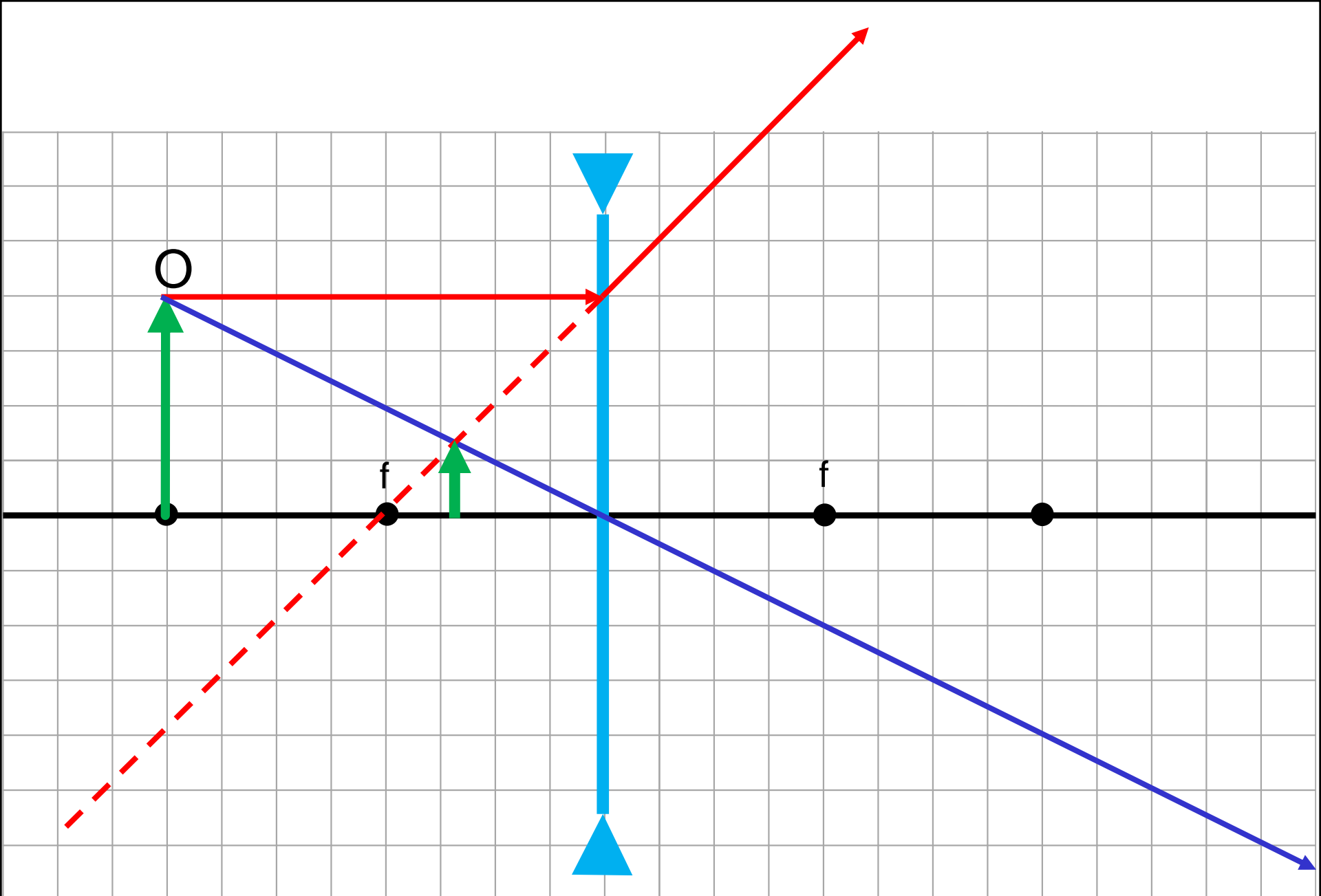


Figura 10: Objeto no anti-principal

CLASSIFICAÇÃO:

Imagem

VIRTUAL

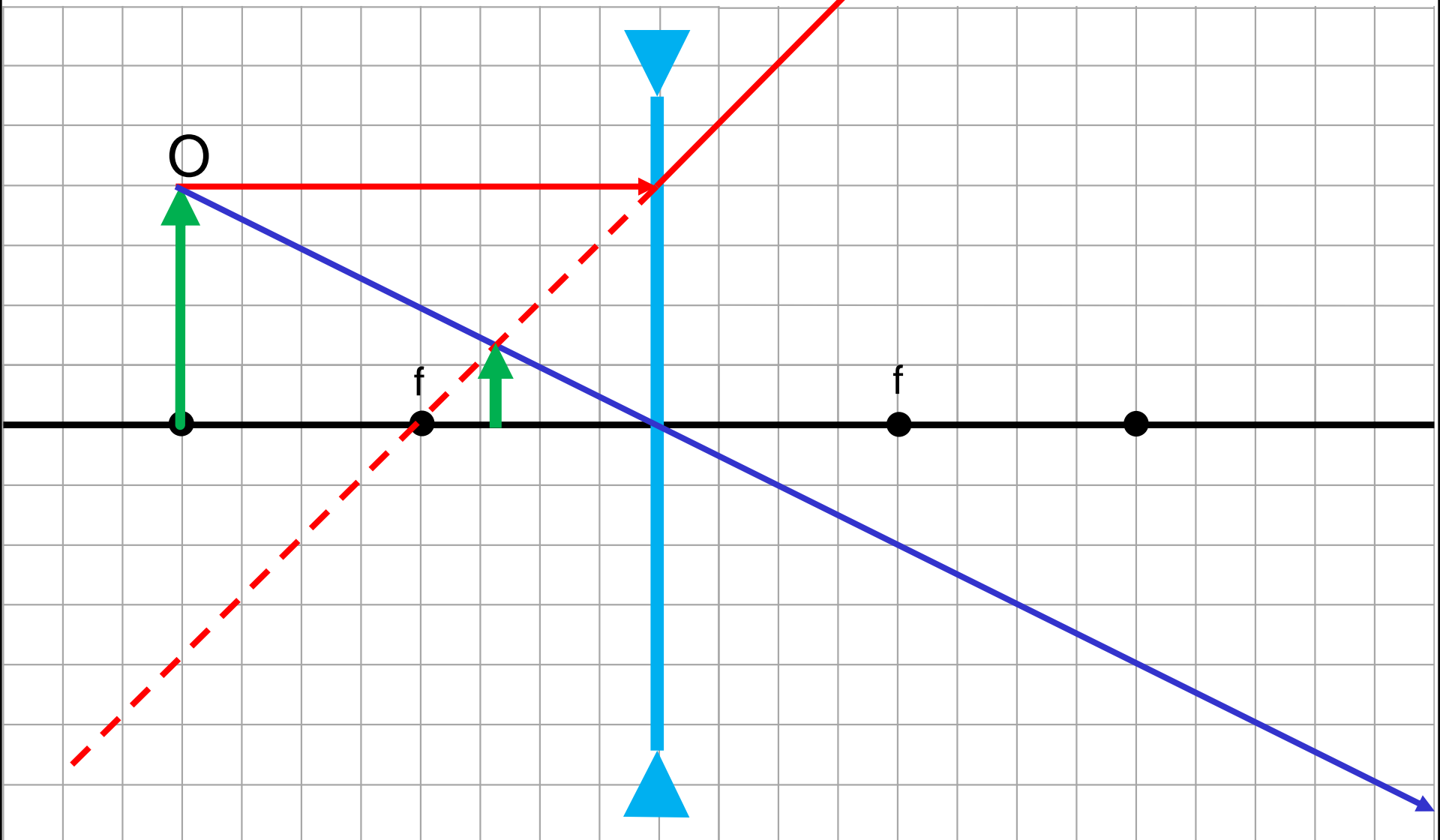


Figura 10: Objeto no anti-principal

CLASSIFICAÇÃO:

Imagem

VIRTUAL  
DIREITA

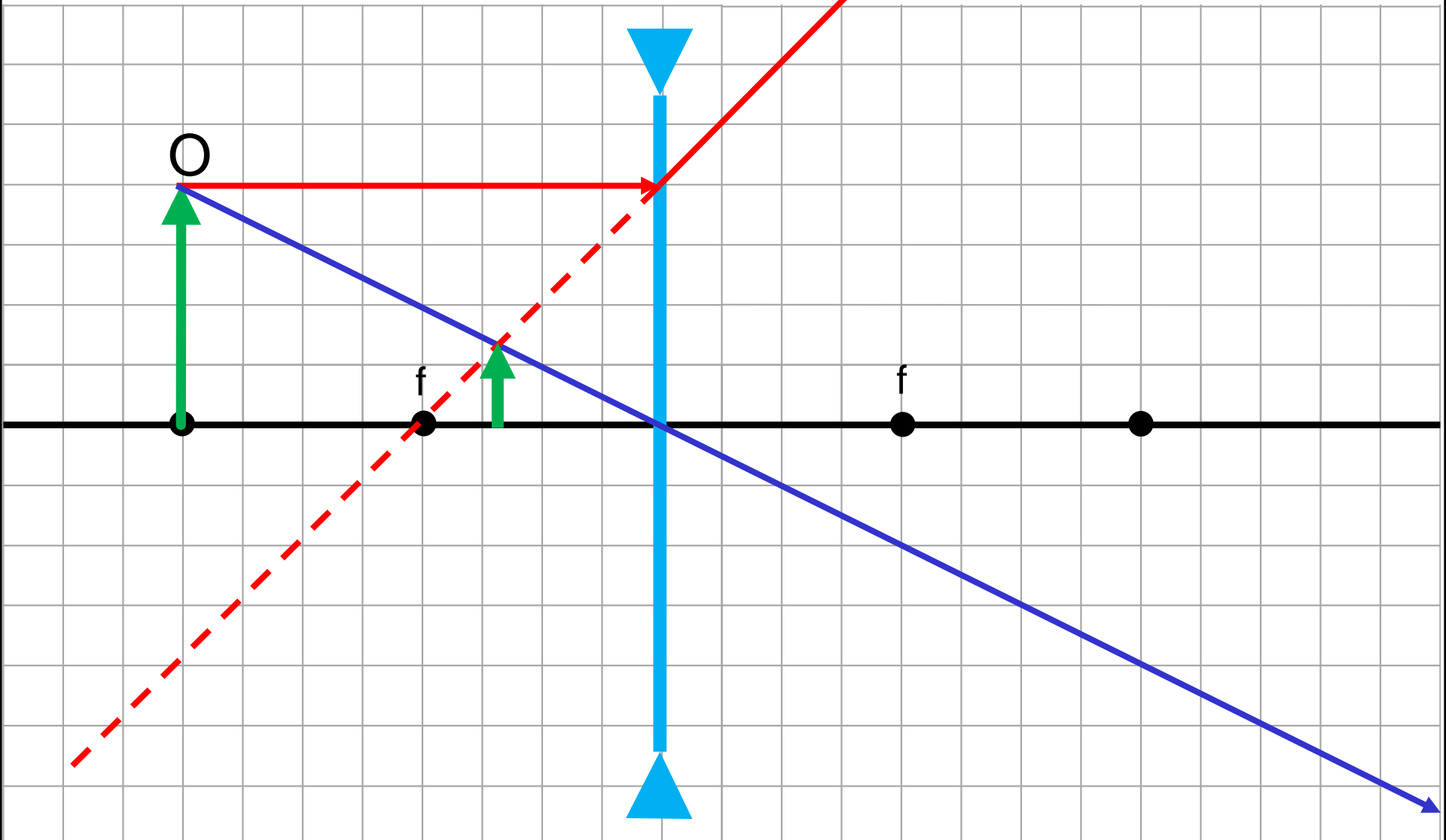


Figura 10: Objeto no anti-principal

CLASSIFICAÇÃO:

Imagem

VIRTUAL  
DIREITA  
MENOR

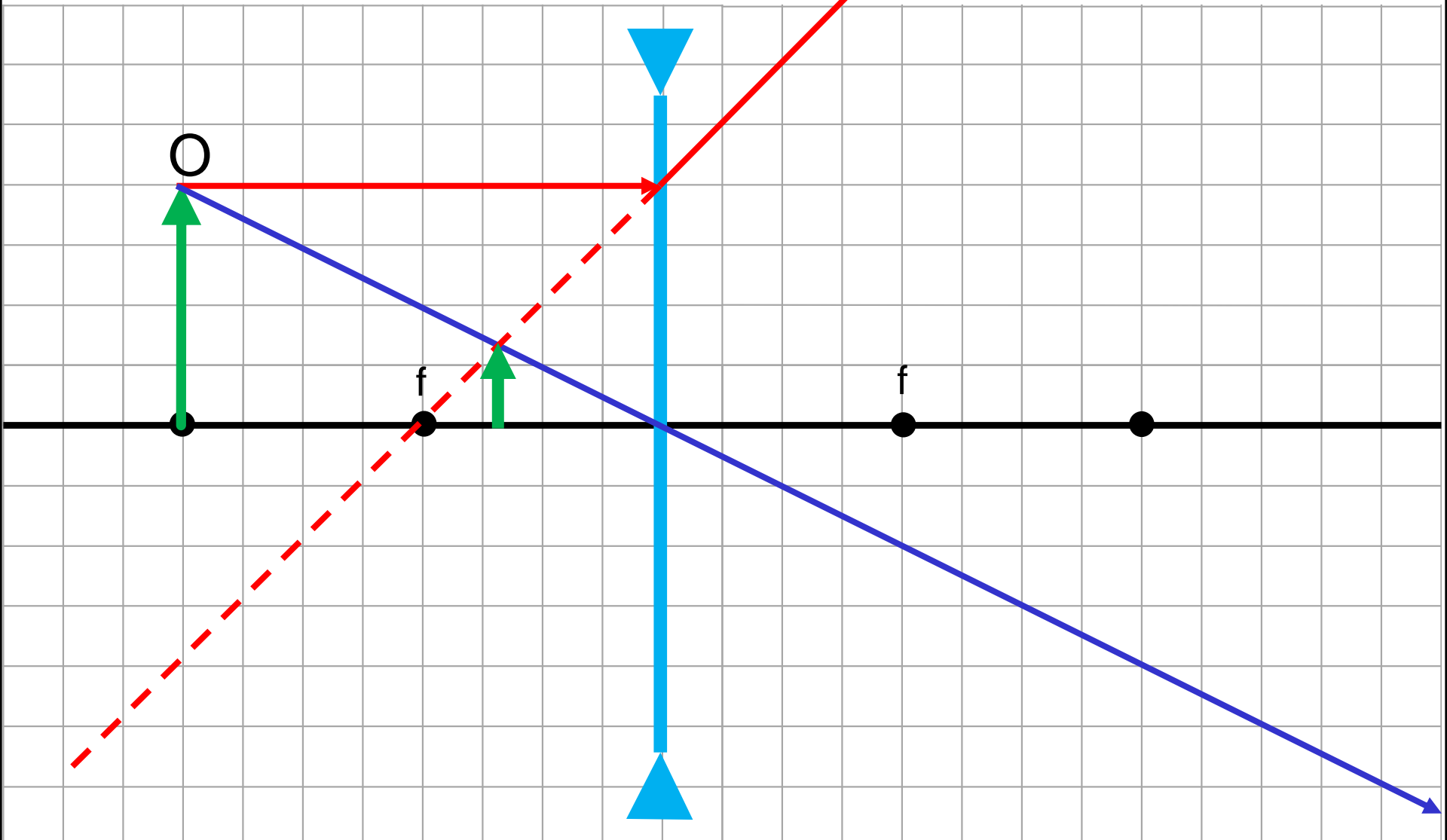


Figura 10: Objeto no anti-principal





Quinto caso

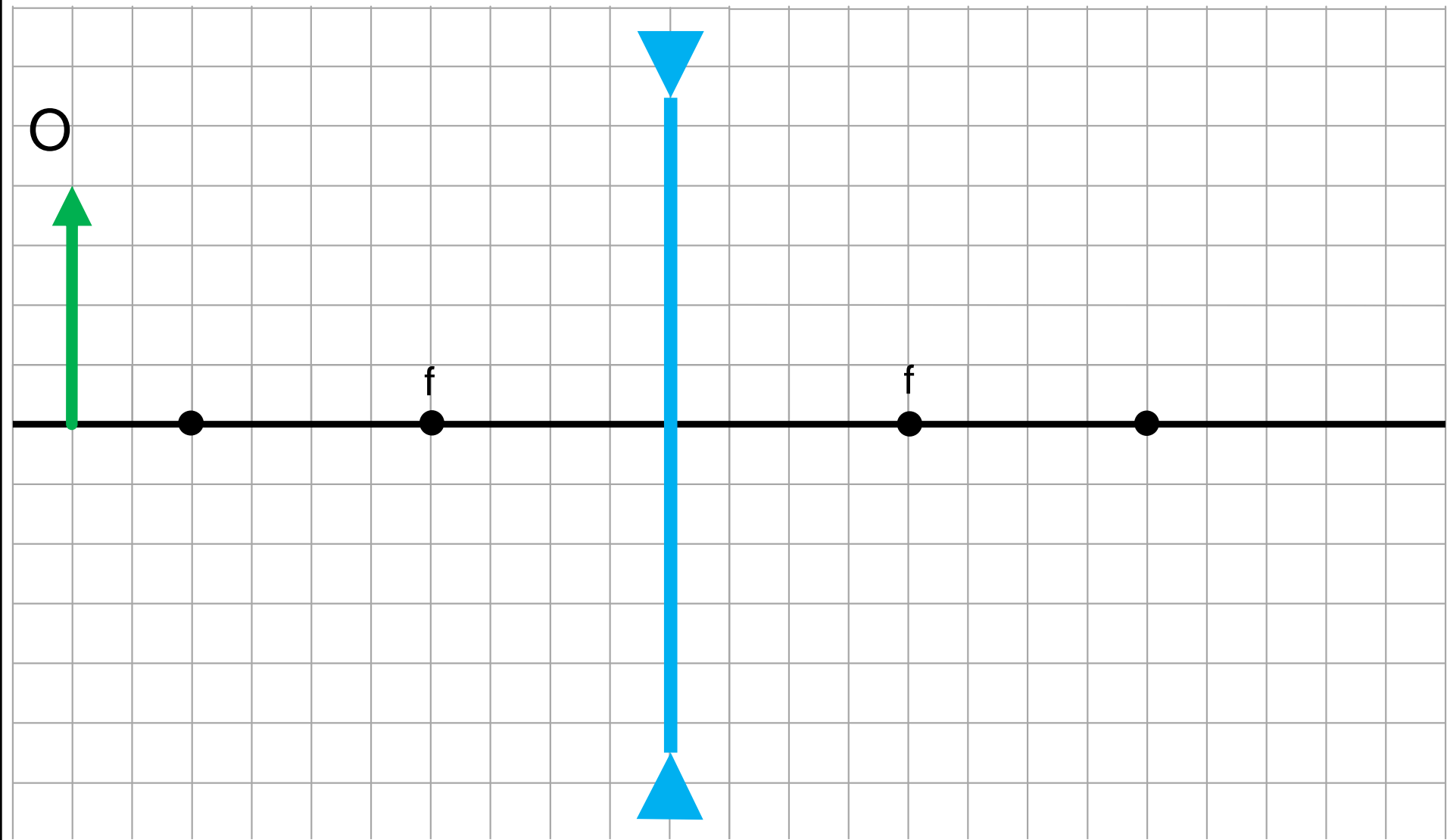


Figura 11: Objeto além do anti-principal

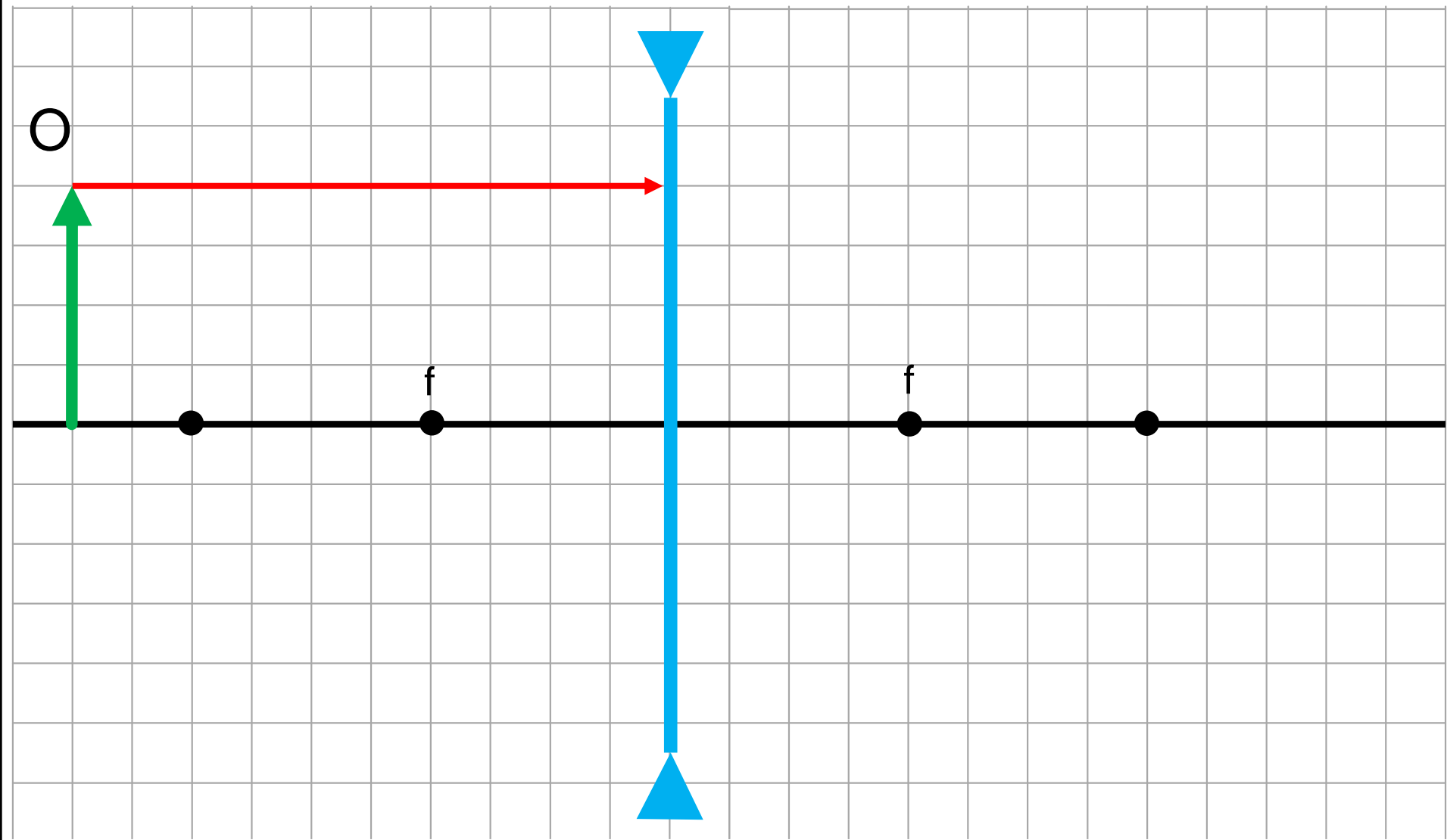


Figura 11: Objeto além do anti-principal

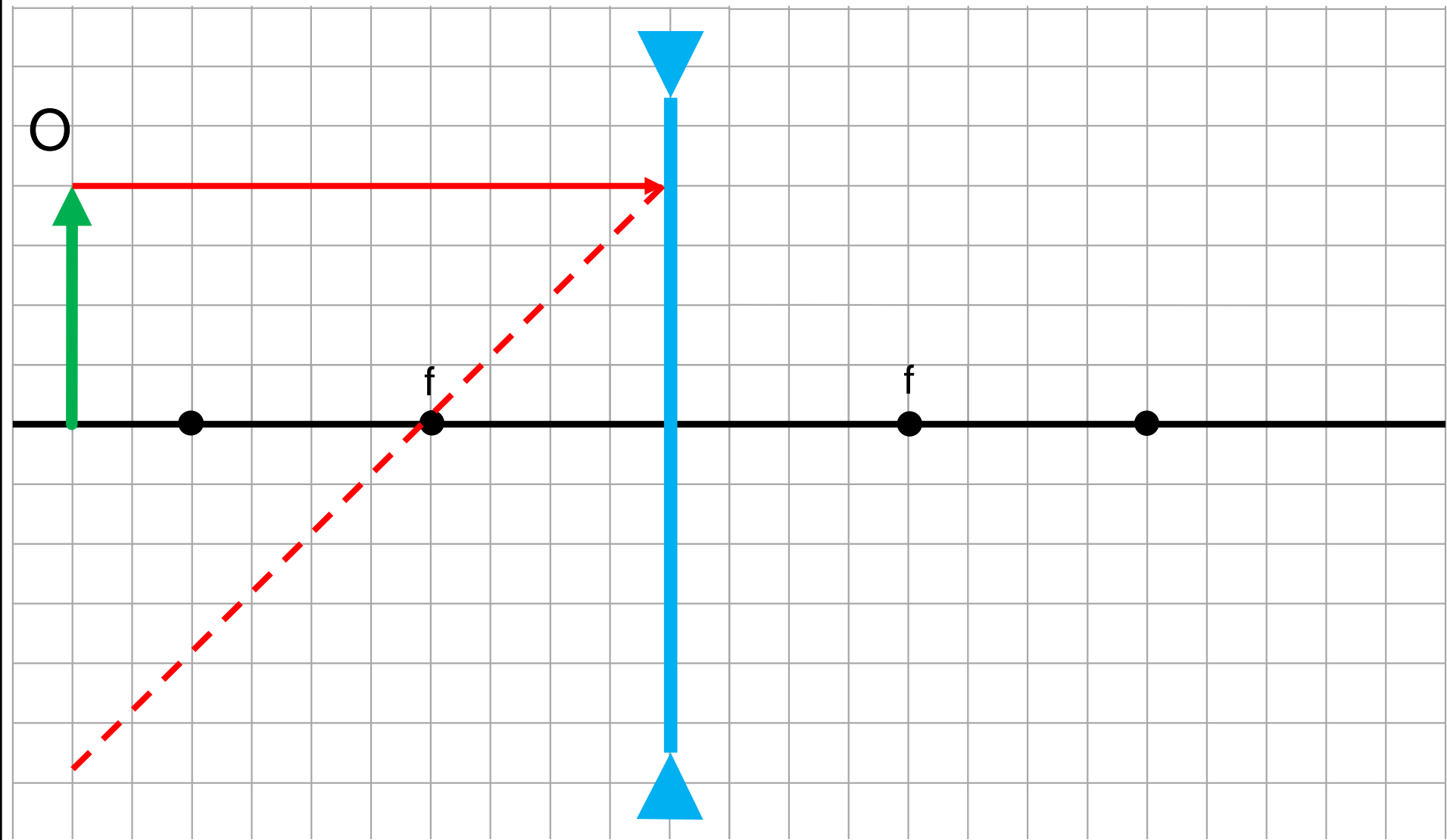


Figura 11: Objeto além do anti-principal

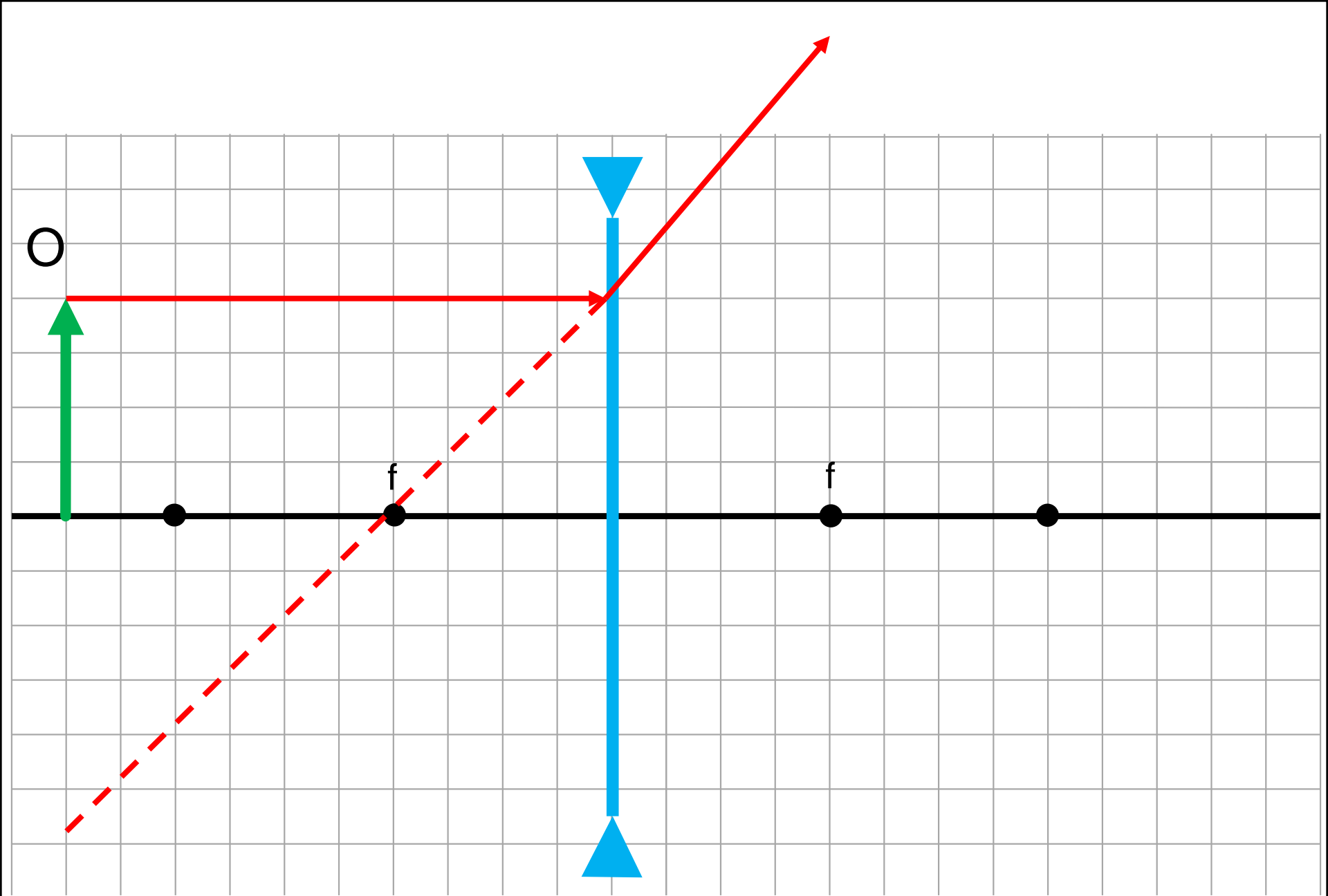


Figura 11: Objeto além do anti-principal

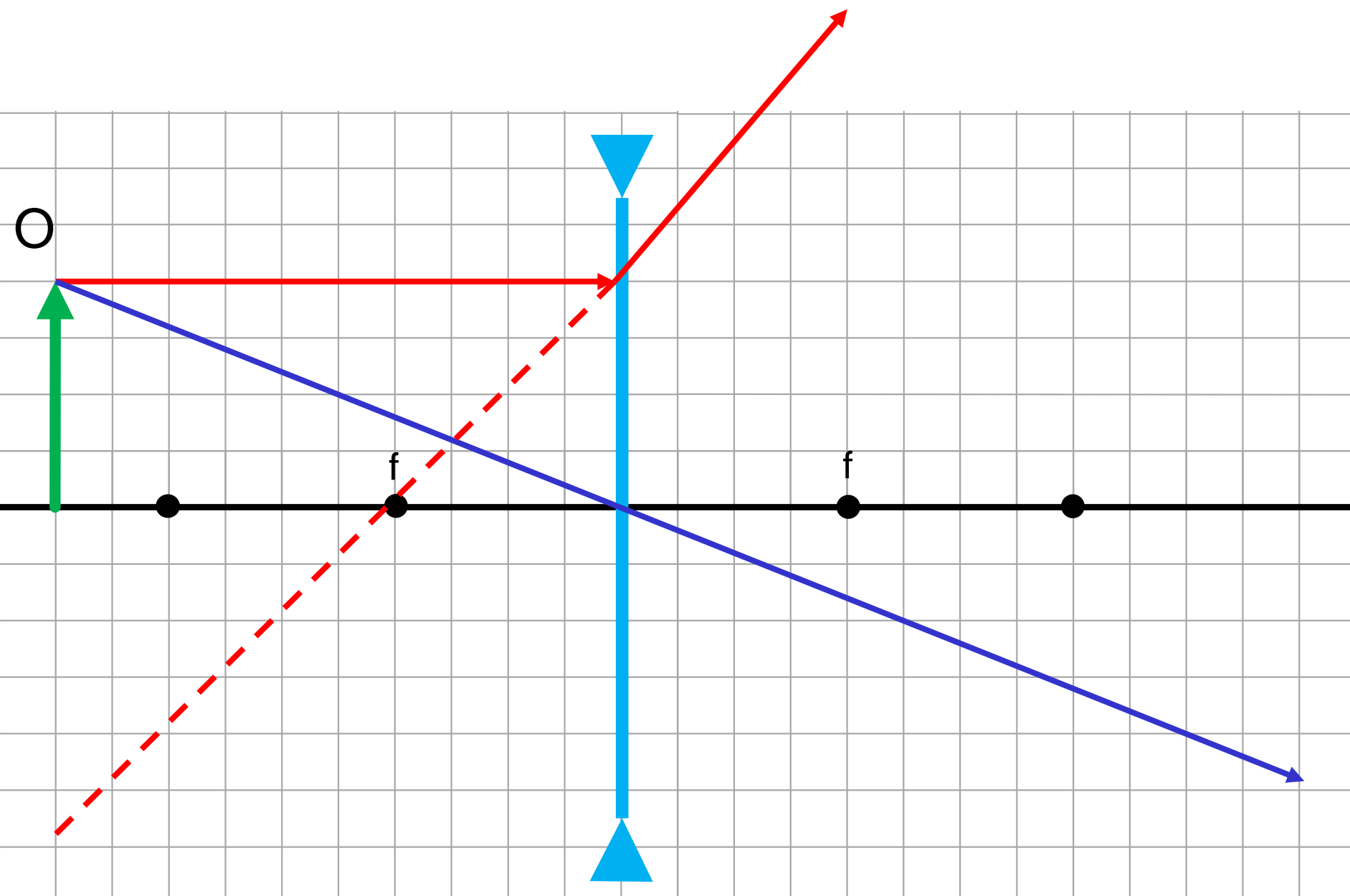


Figura 11: Objeto além do anti-principal

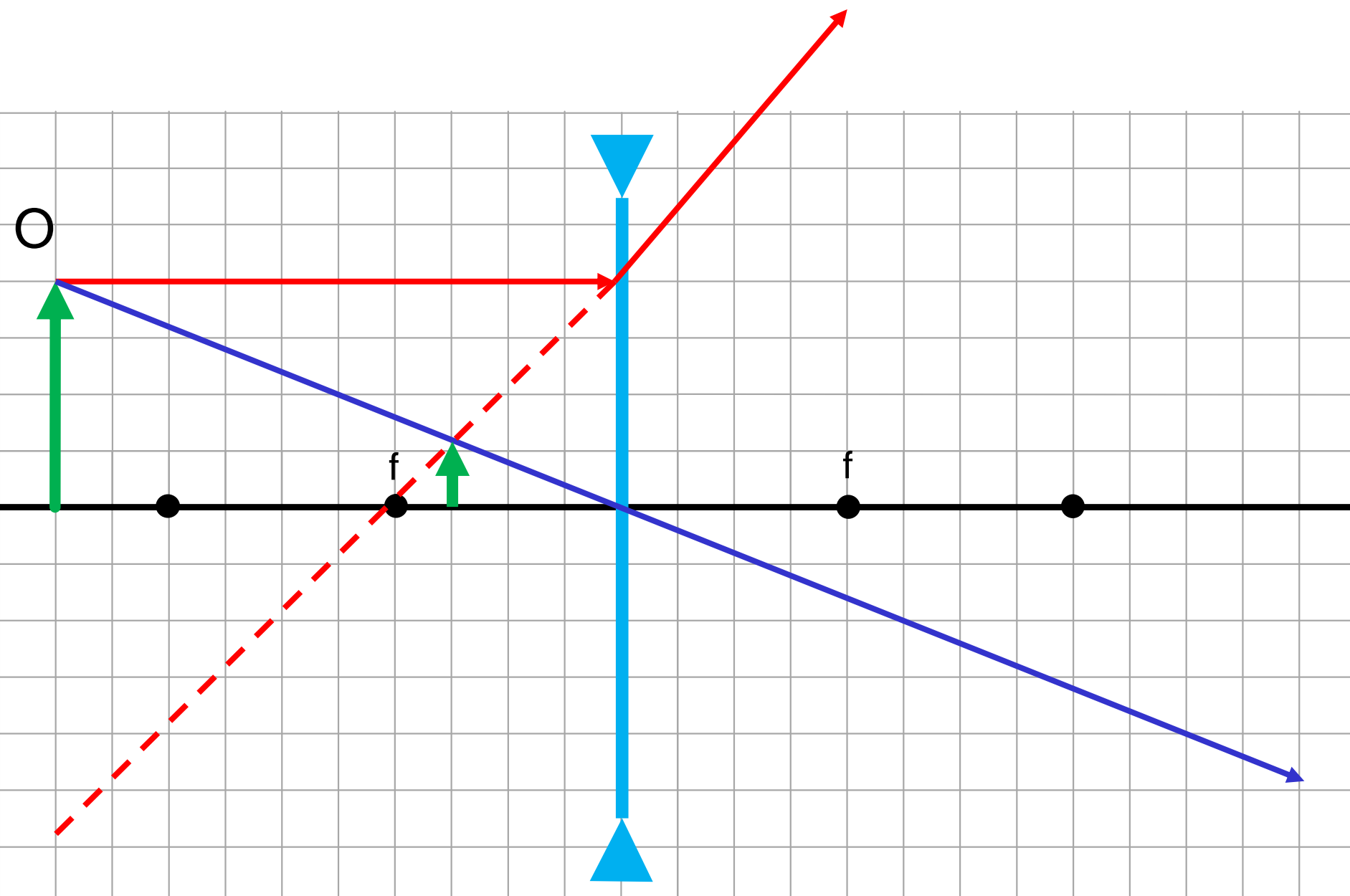


Figura 11: Objeto além do anti-principal

CLASSIFICAÇÃO:

Imagem

VIRTUAL

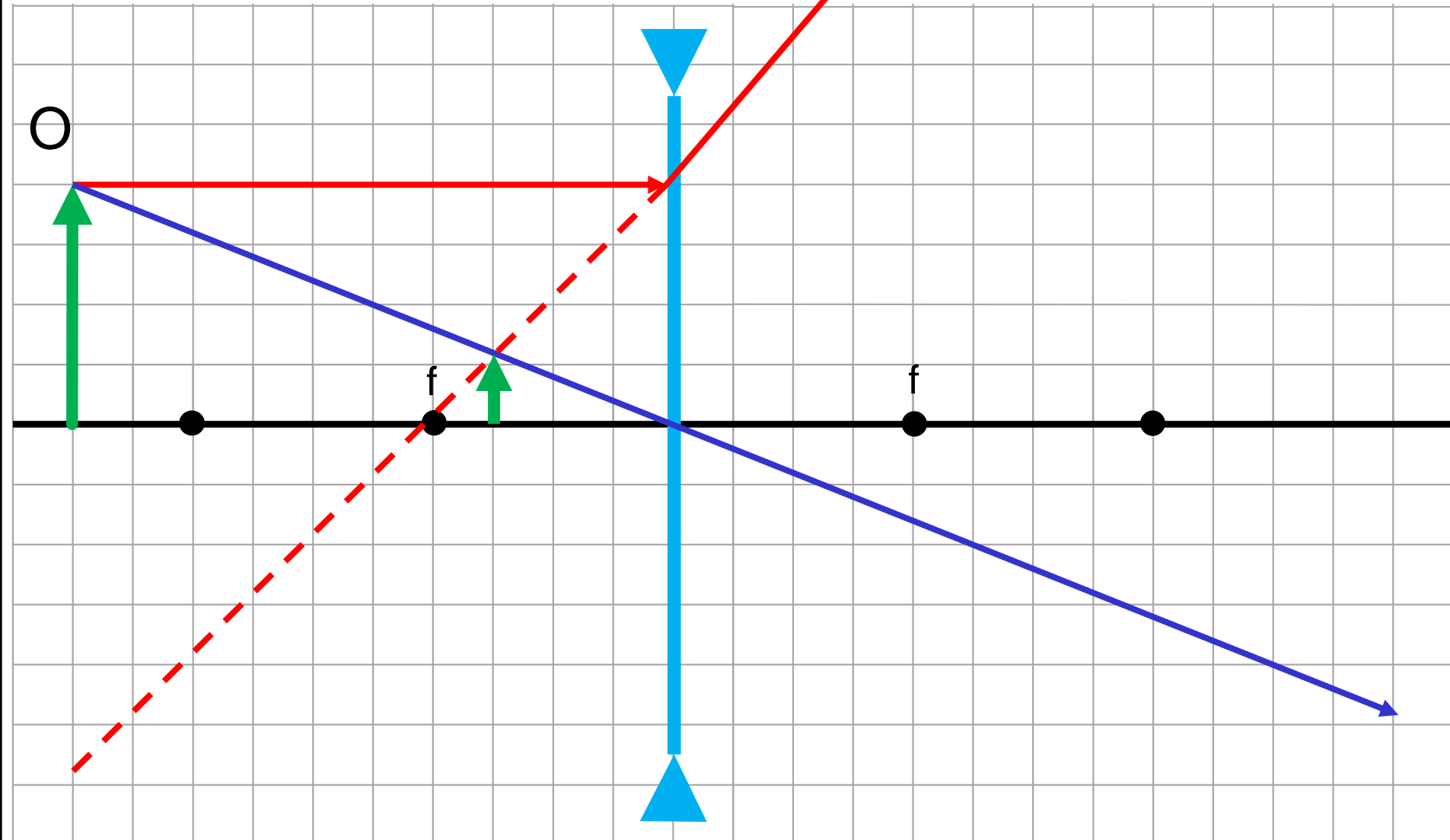


Figura 11: Objeto além do anti-principal



CLASSIFICAÇÃO:

Imagem

VIRTUAL  
DIREITA

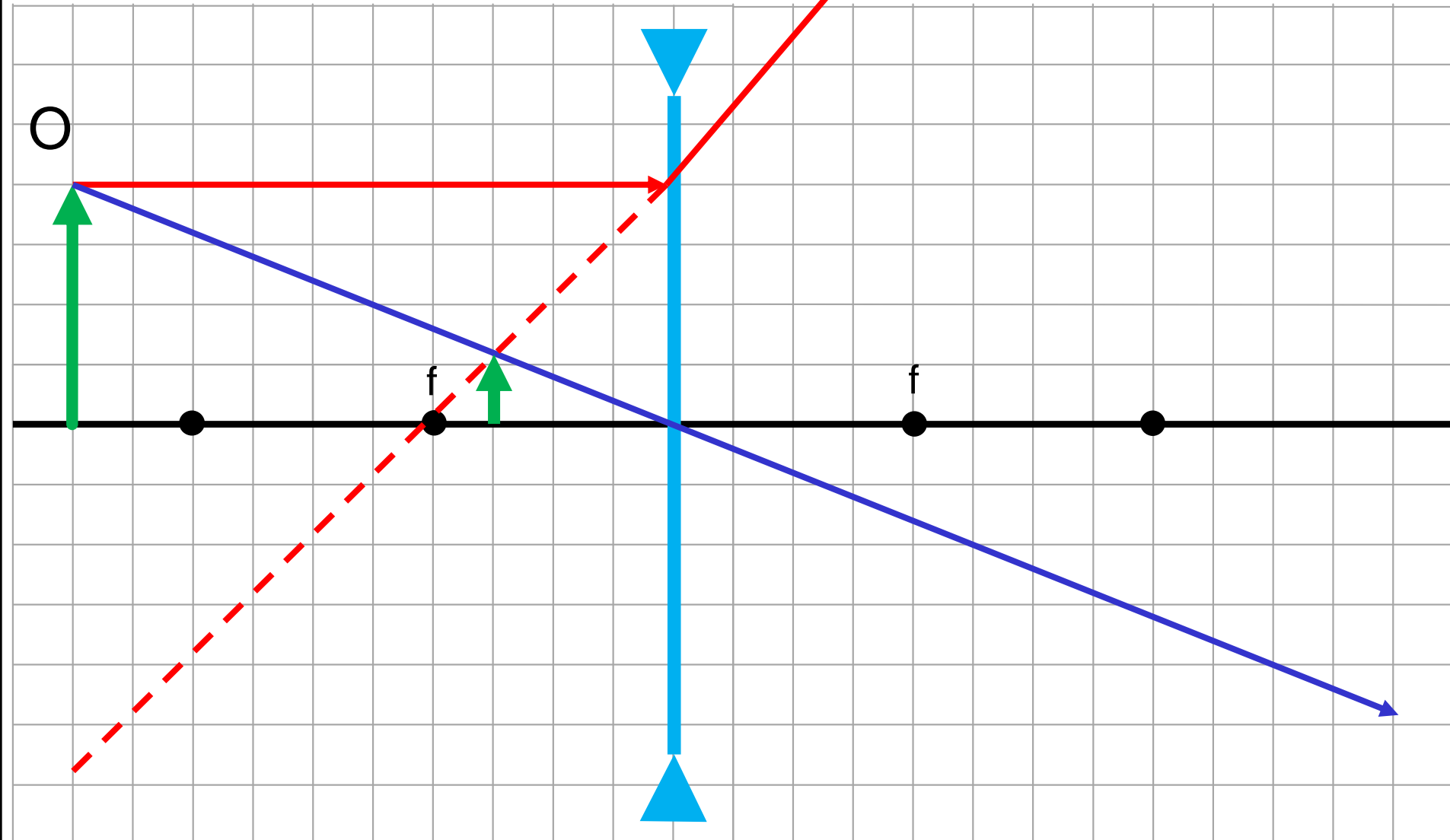


Figura 11: Objeto além do anti-principal

CLASSIFICAÇÃO:

Imagem

VIRTUAL  
DIREITA  
MENOR

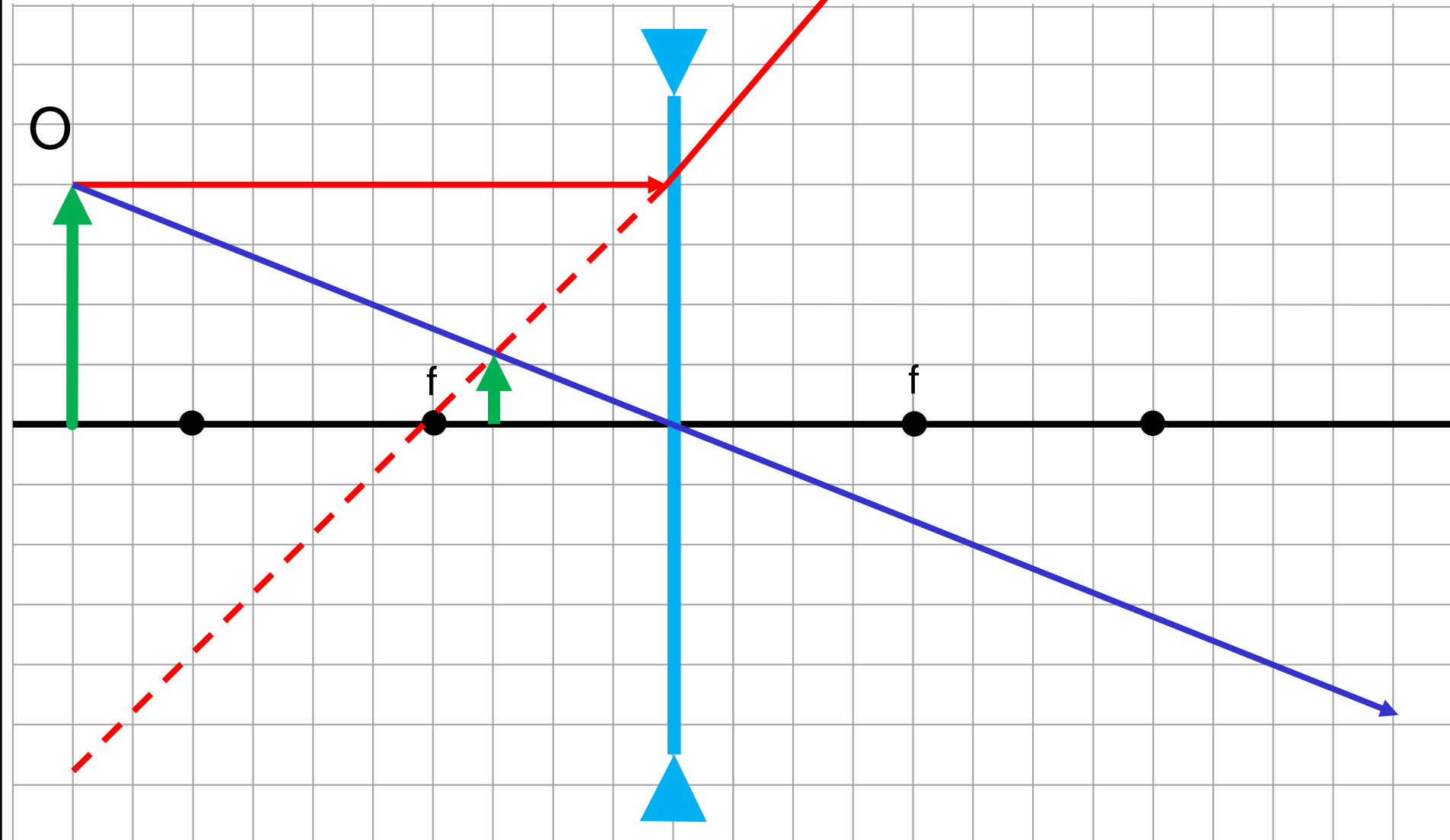


Figura 11: Objeto além do anti-principal



Sexto caso...

...e último!!!

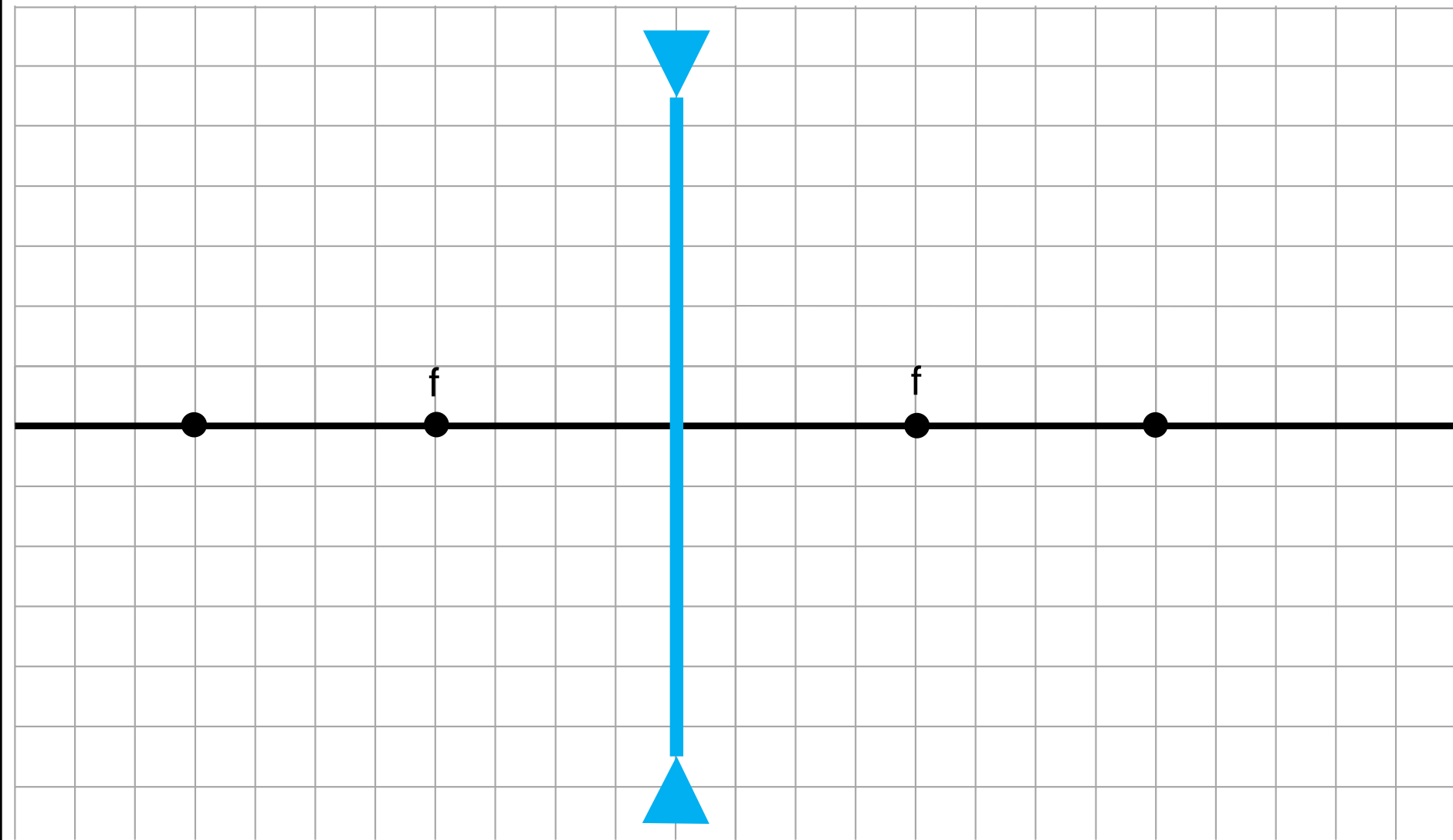


Figura 12: Objeto no “infinito”

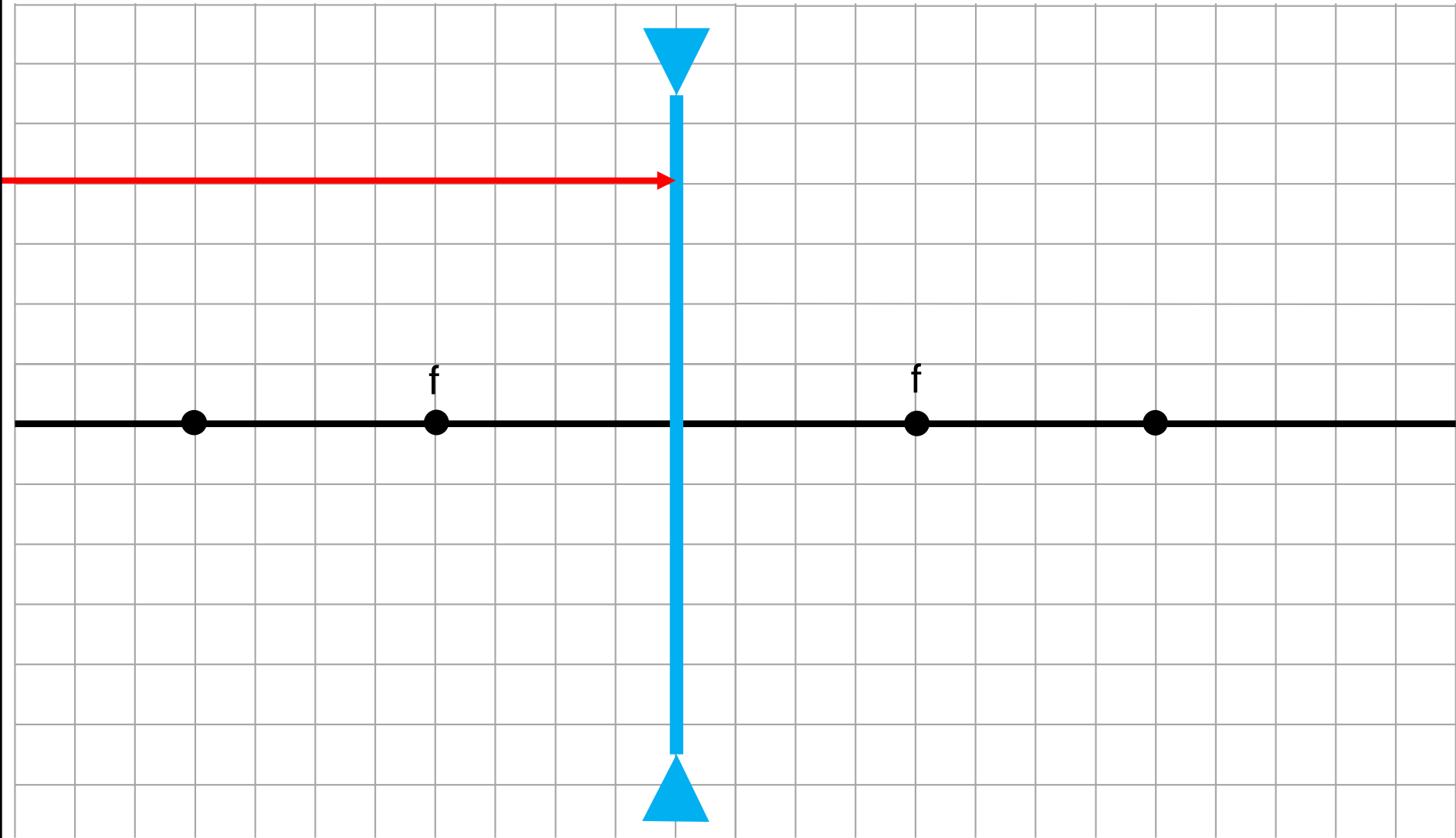


Figura 12: Objeto no “infinito”

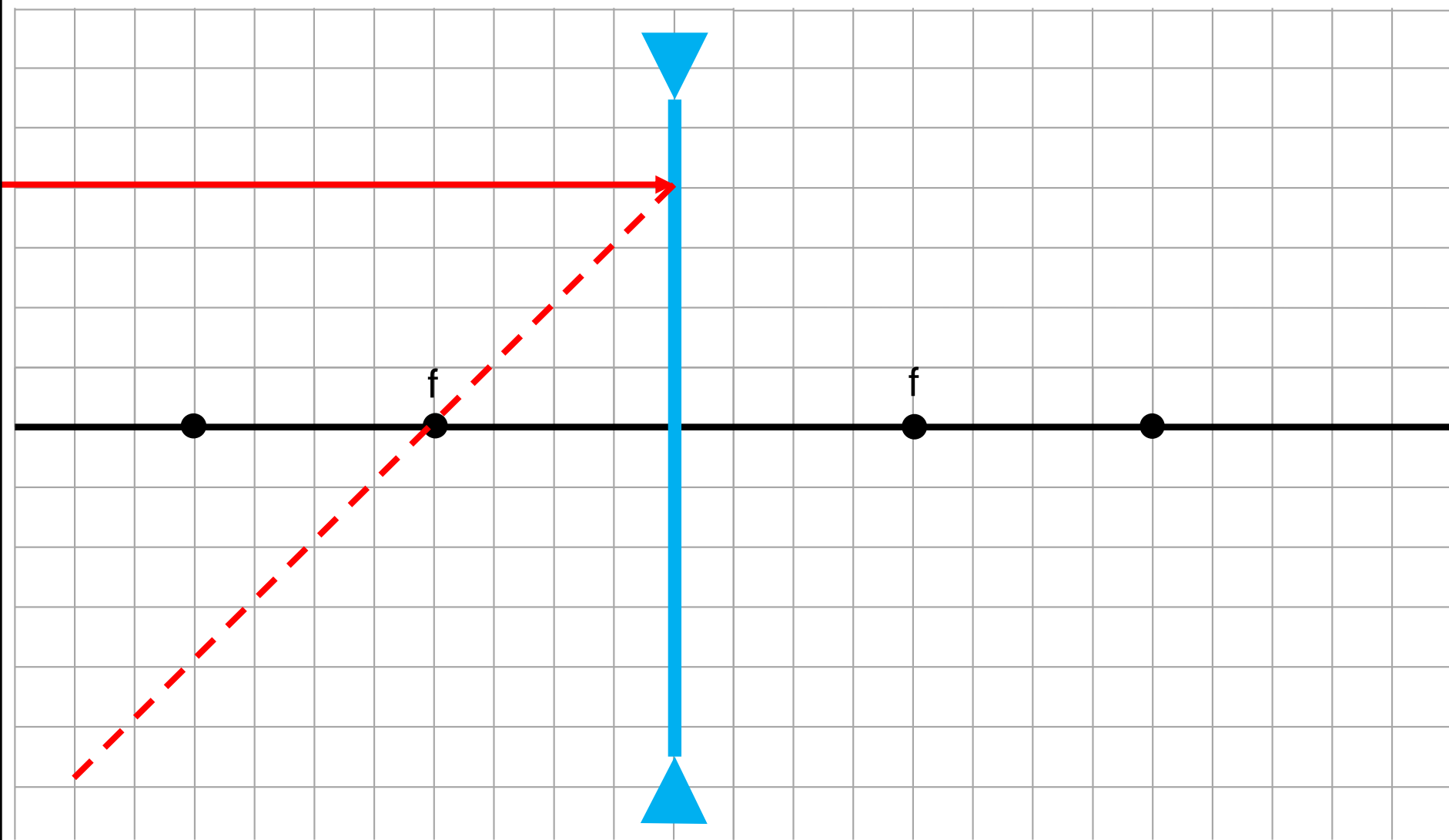


Figura 12: Objeto no “infinito”

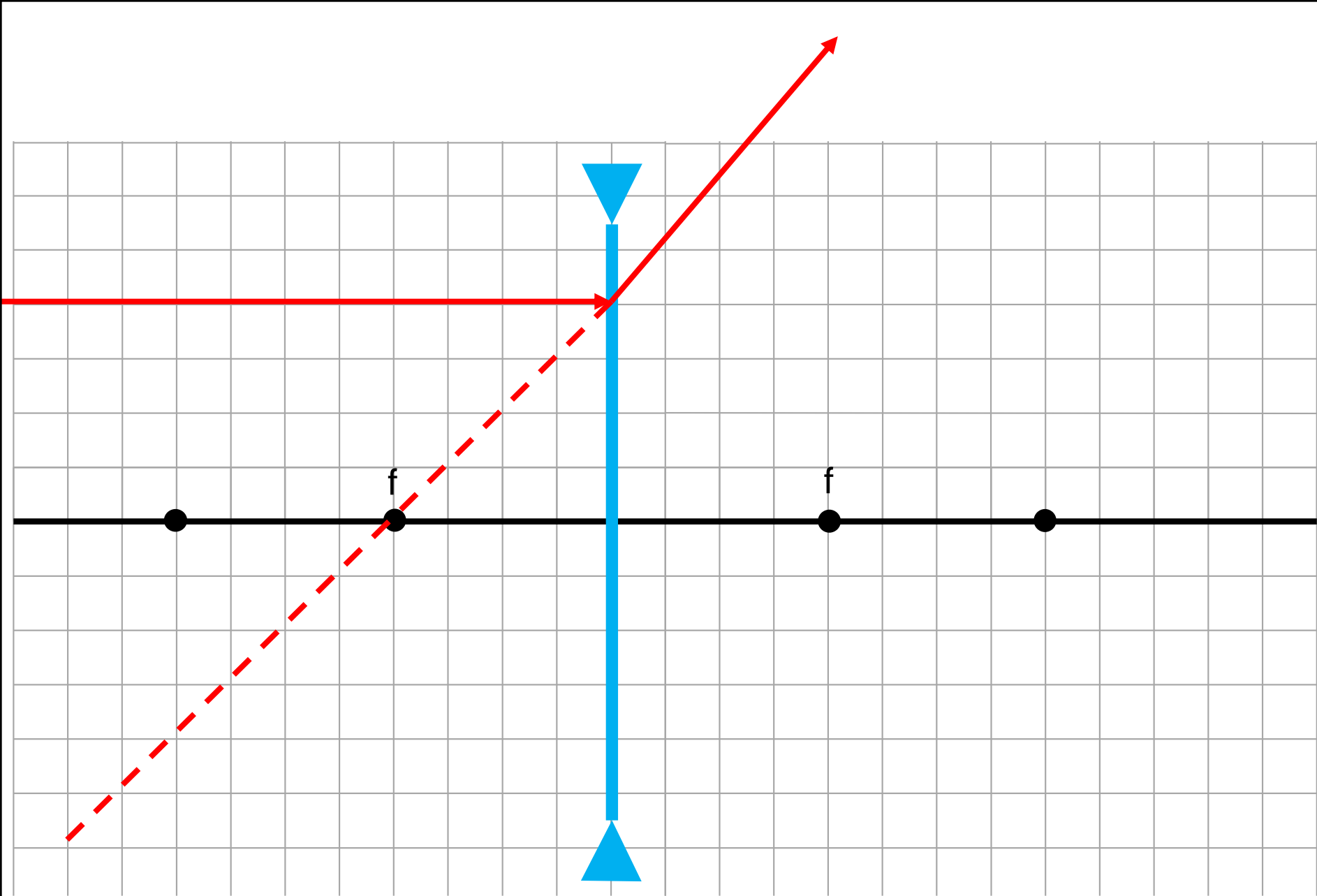


Figura 12: Objeto no “infinito”

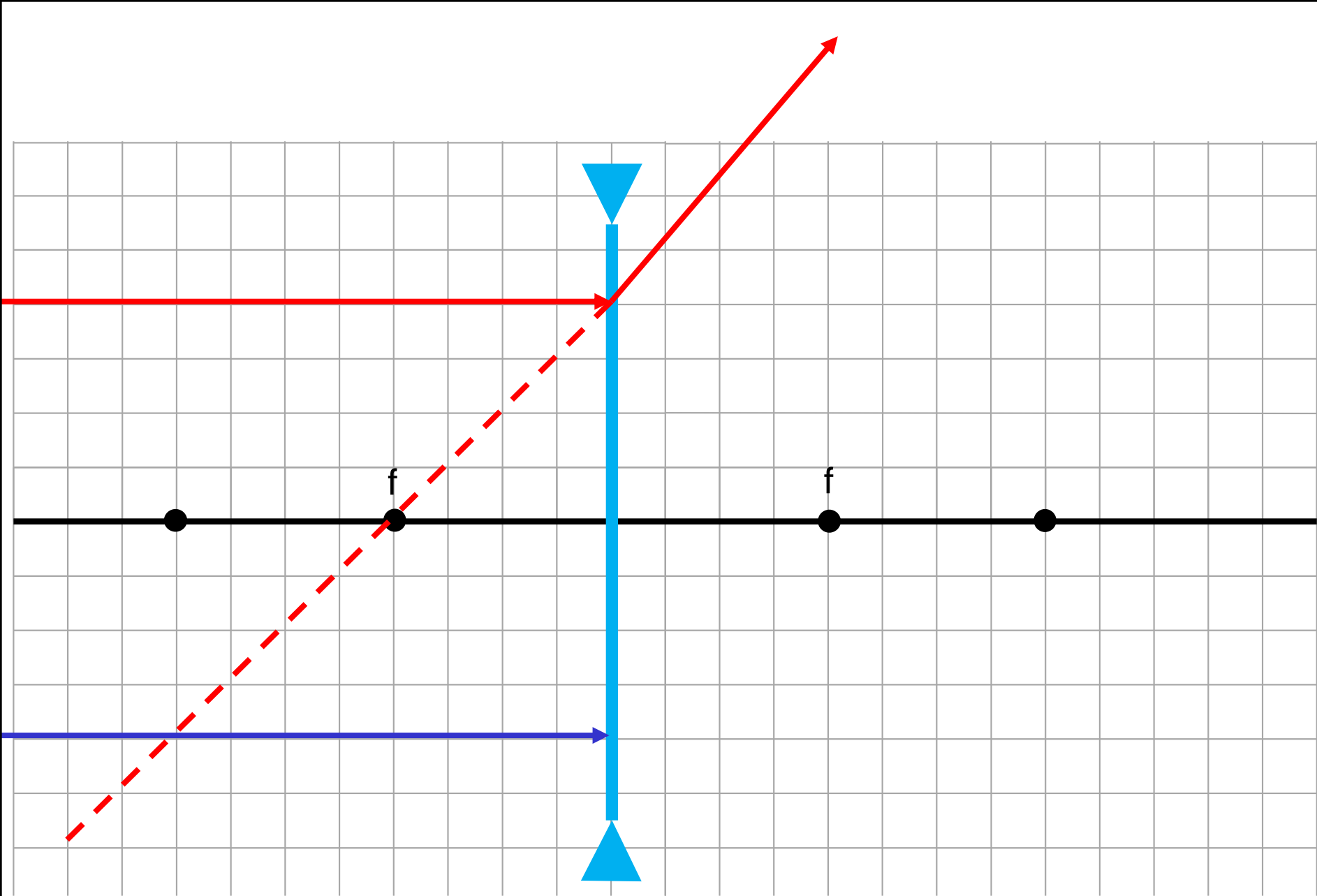


Figura 12: Objeto no “infinito”



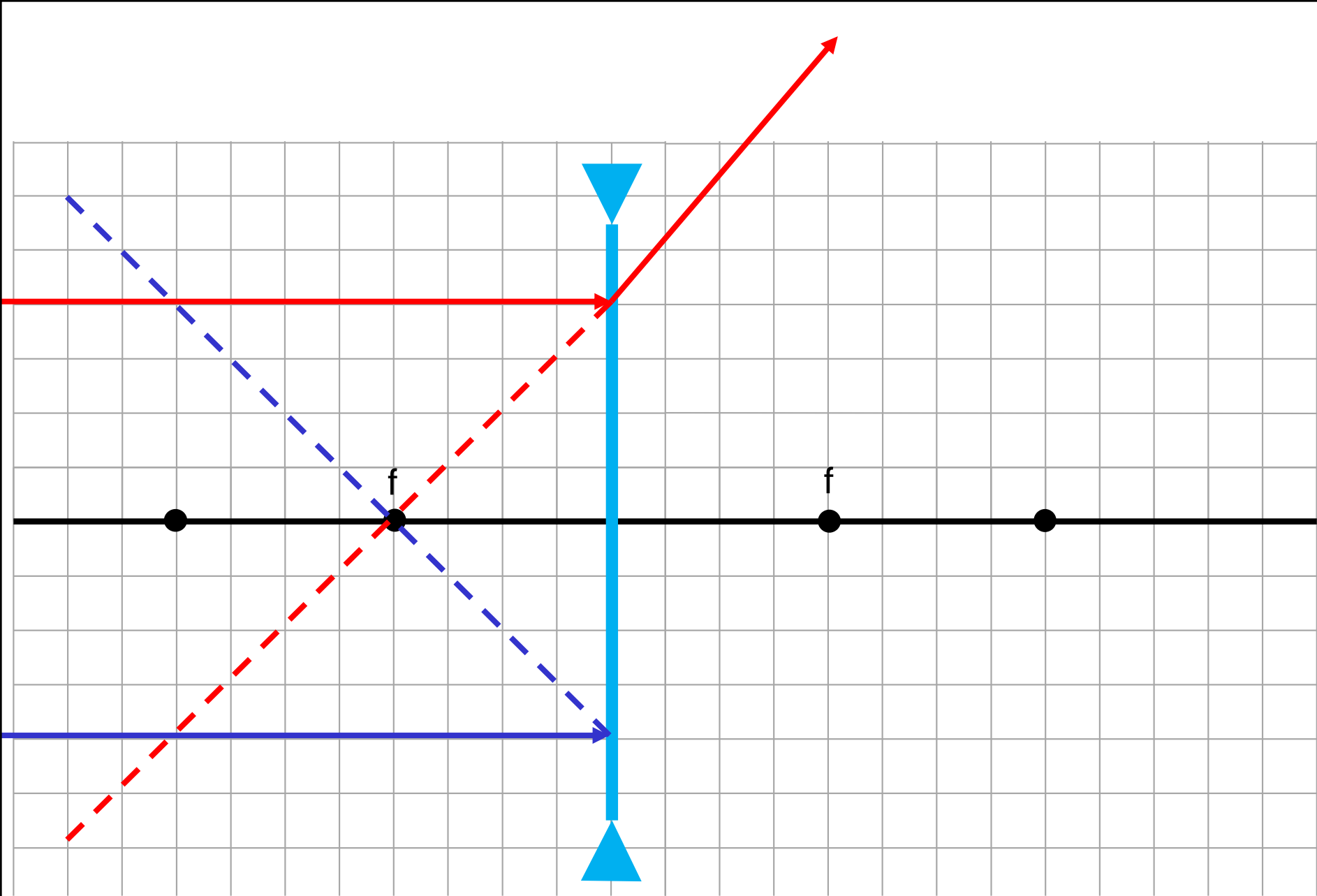


Figura 12: Objeto no “infinito”

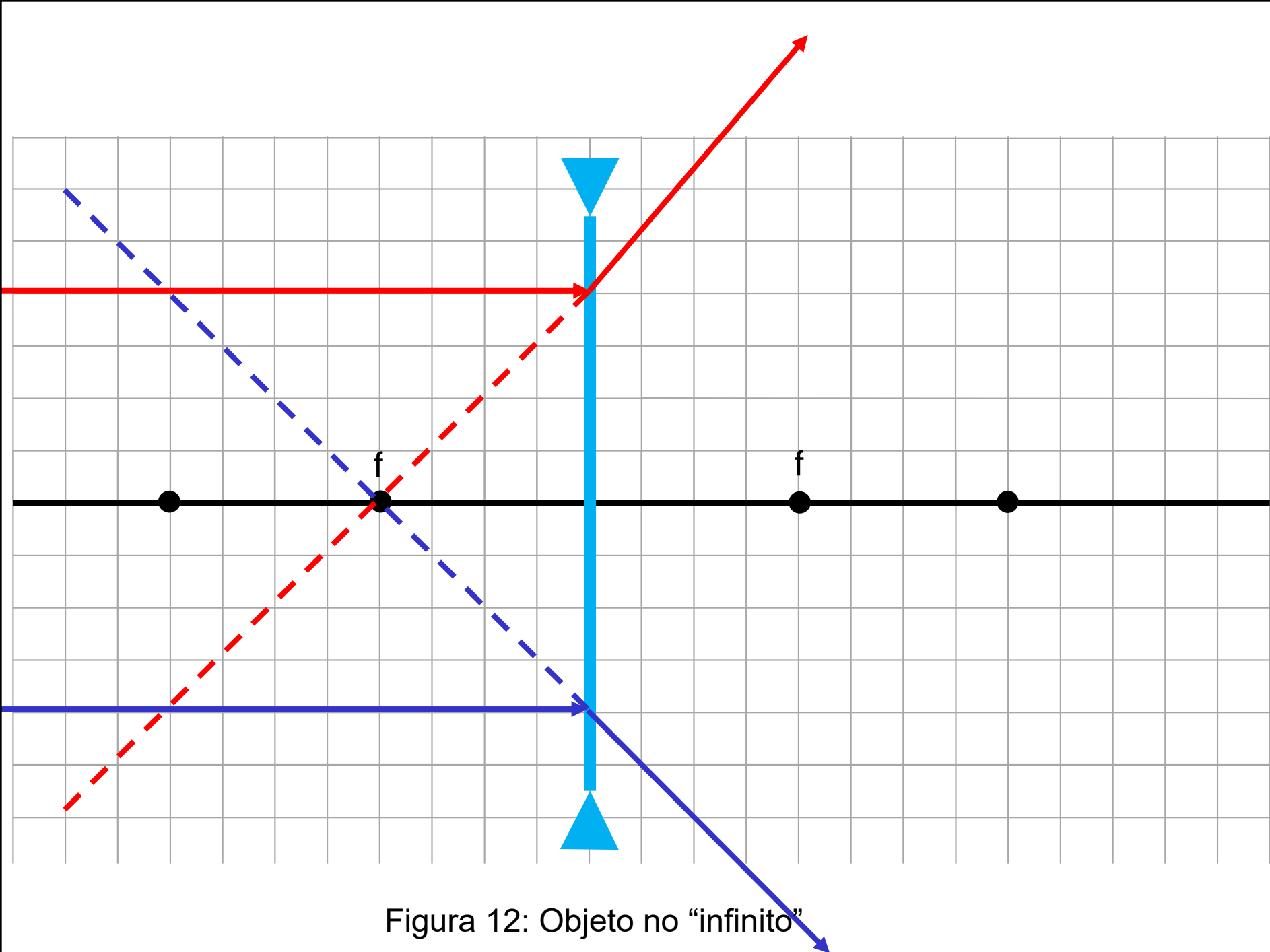


Figura 12: Objeto no "infinito"

CLASSIFICAÇÃO: Imagem

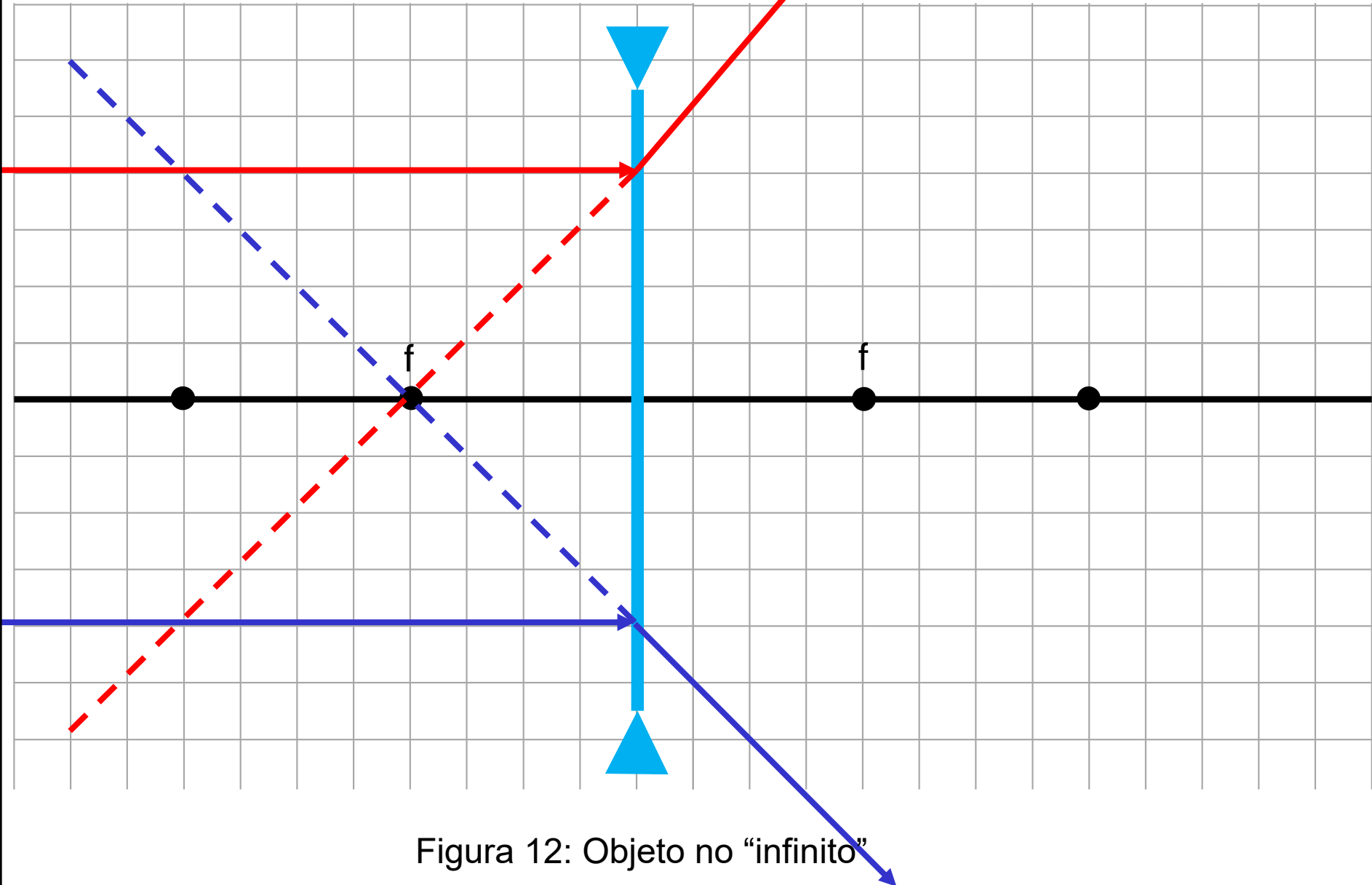


Figura 12: Objeto no "infinito"

CLASSIFICAÇÃO:

Imagem PONTUAL E  
LOCALIZADA NO FOCO  
IMAGEM DA LENTE

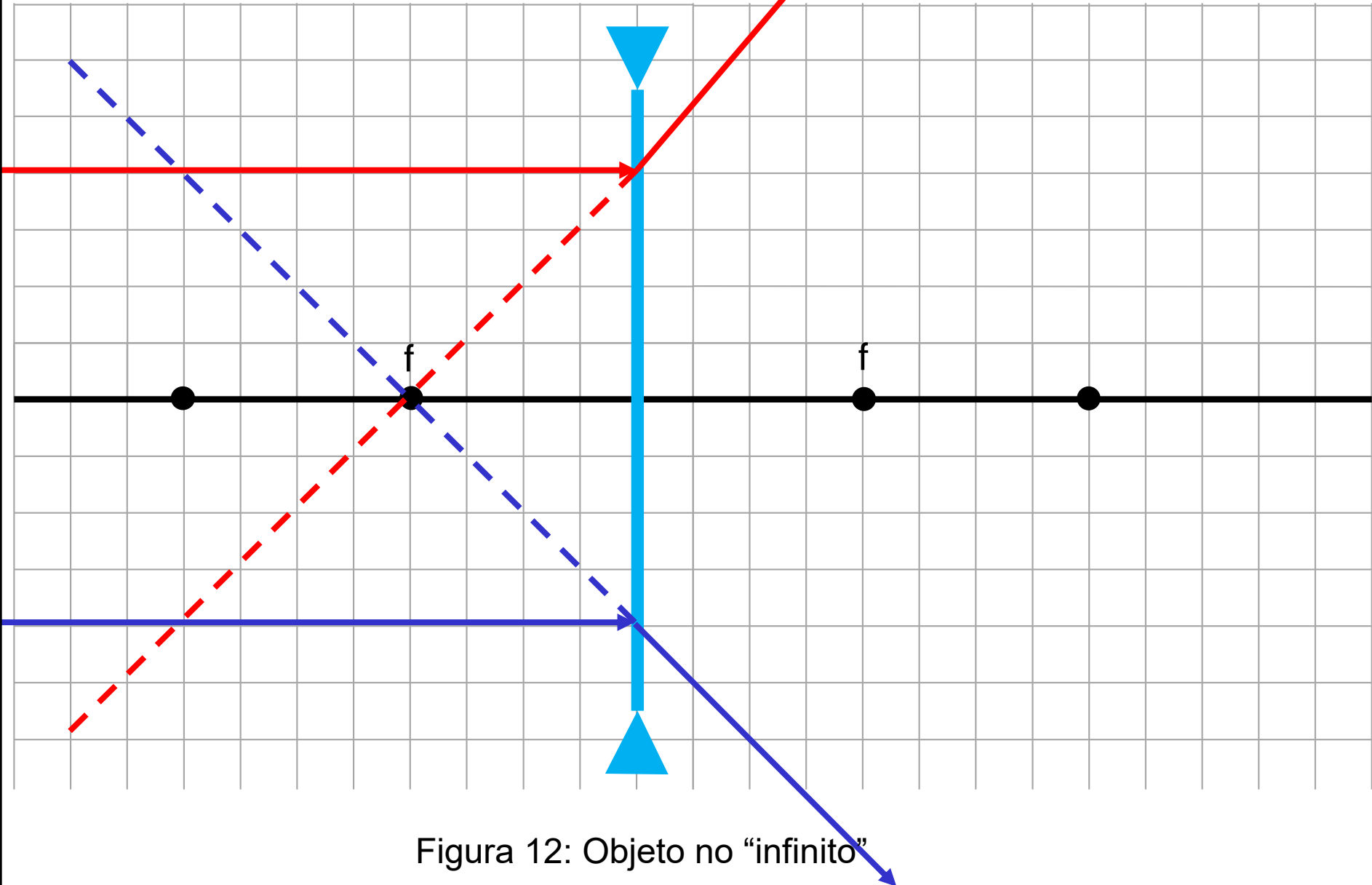


Figura 12: Objeto no "infinito"

VEJAMOS UMA ANIMAÇÃO  
PARA RESUMIR O QUE  
VIMOS NESTA AULA  
(CLIQUE AQUI)