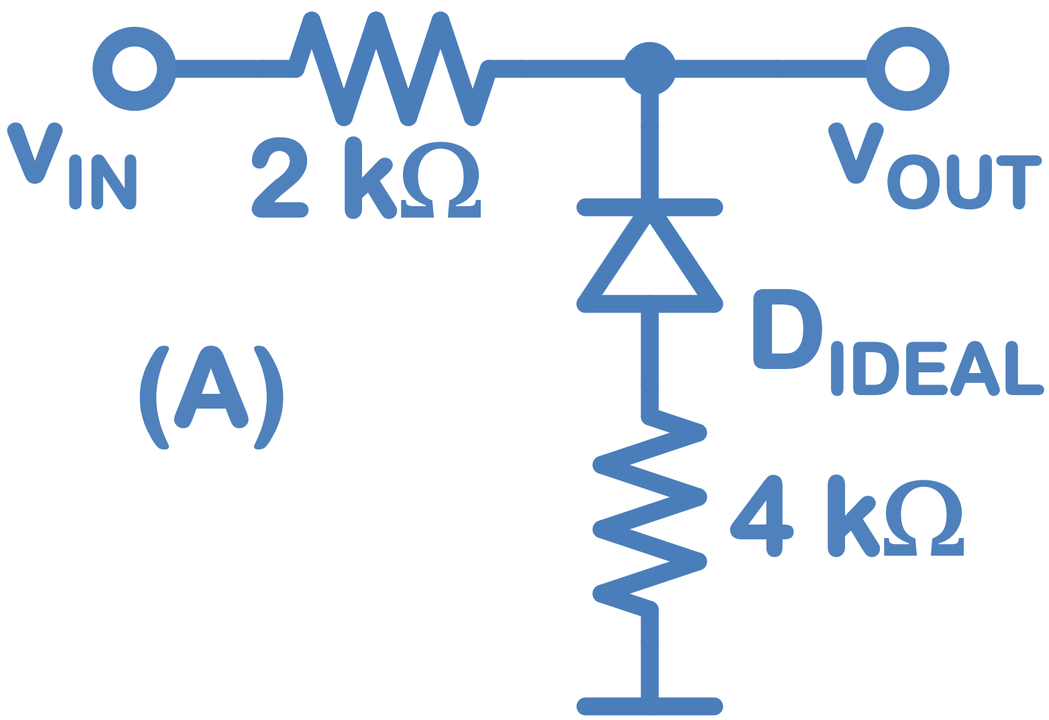
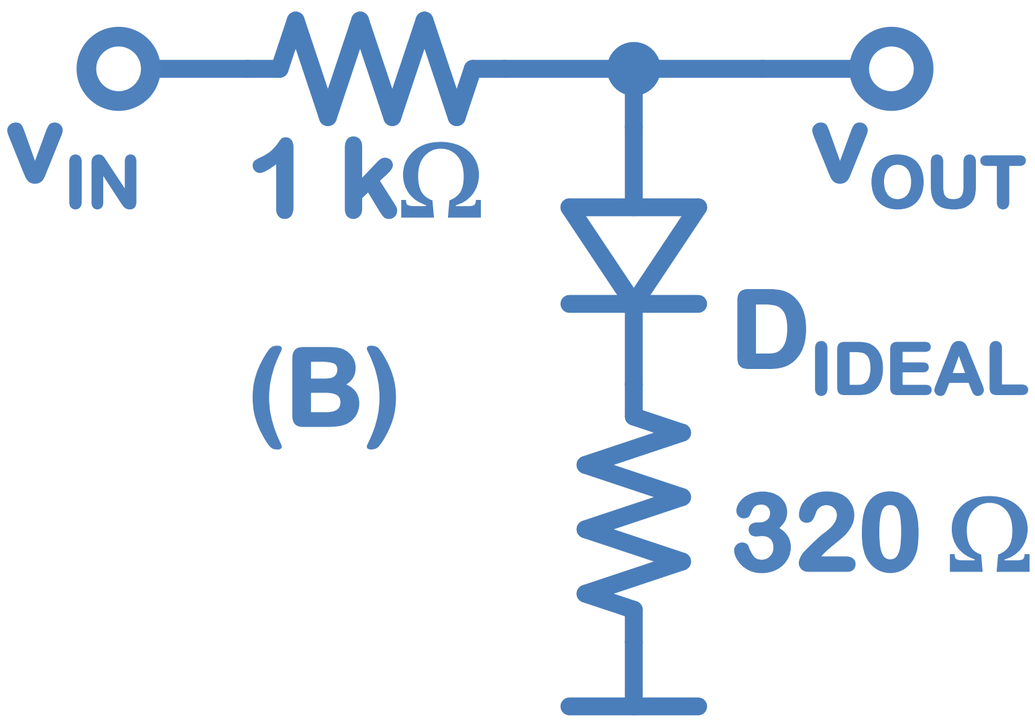
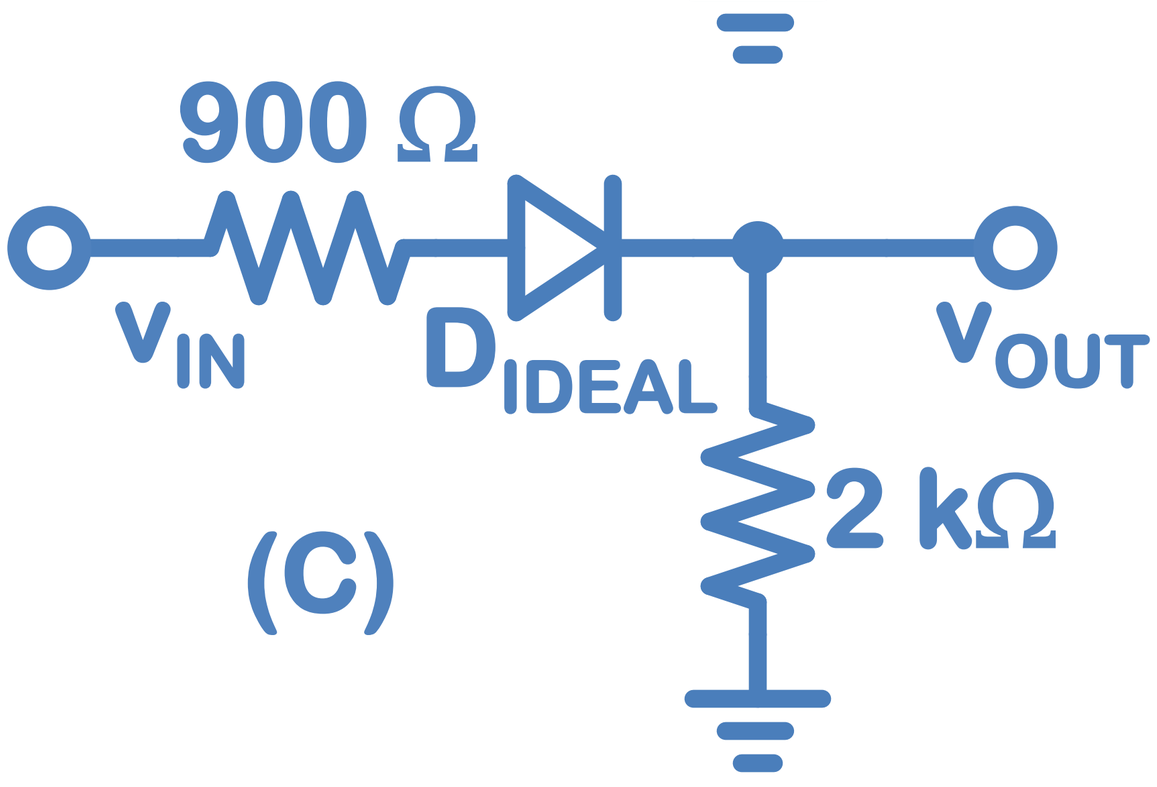
Problem 3. Find the equations and plot $v_{OUT}(v_{IN})$ for each circuit.



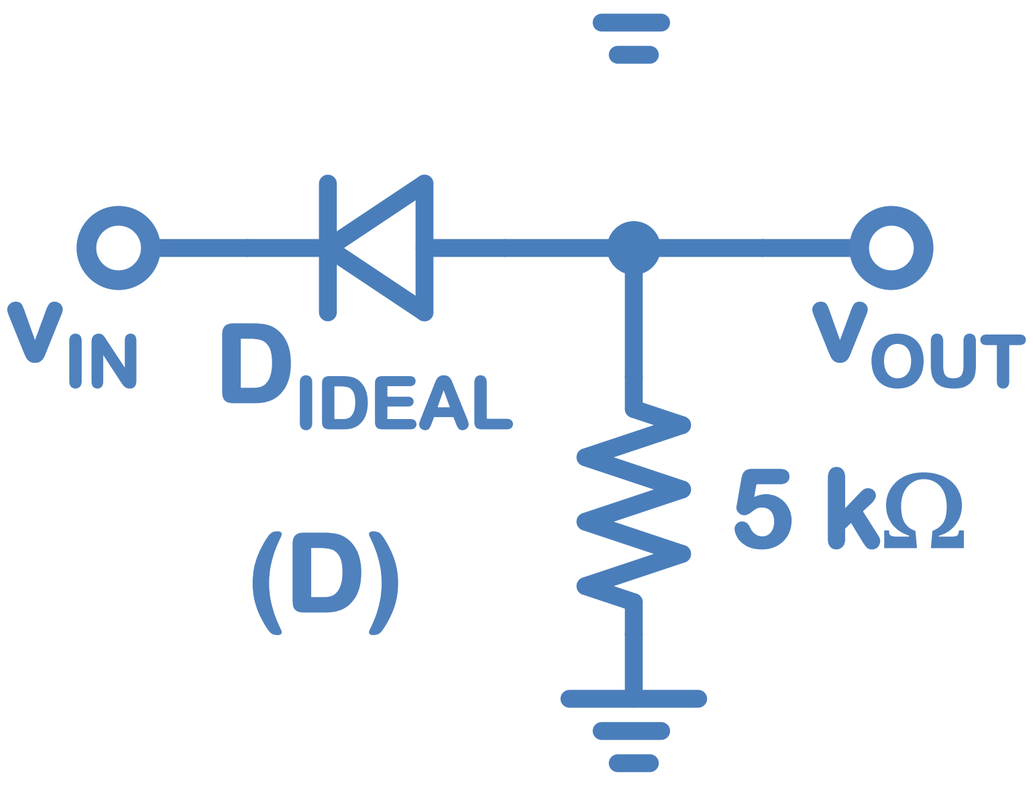
(A)



(B)



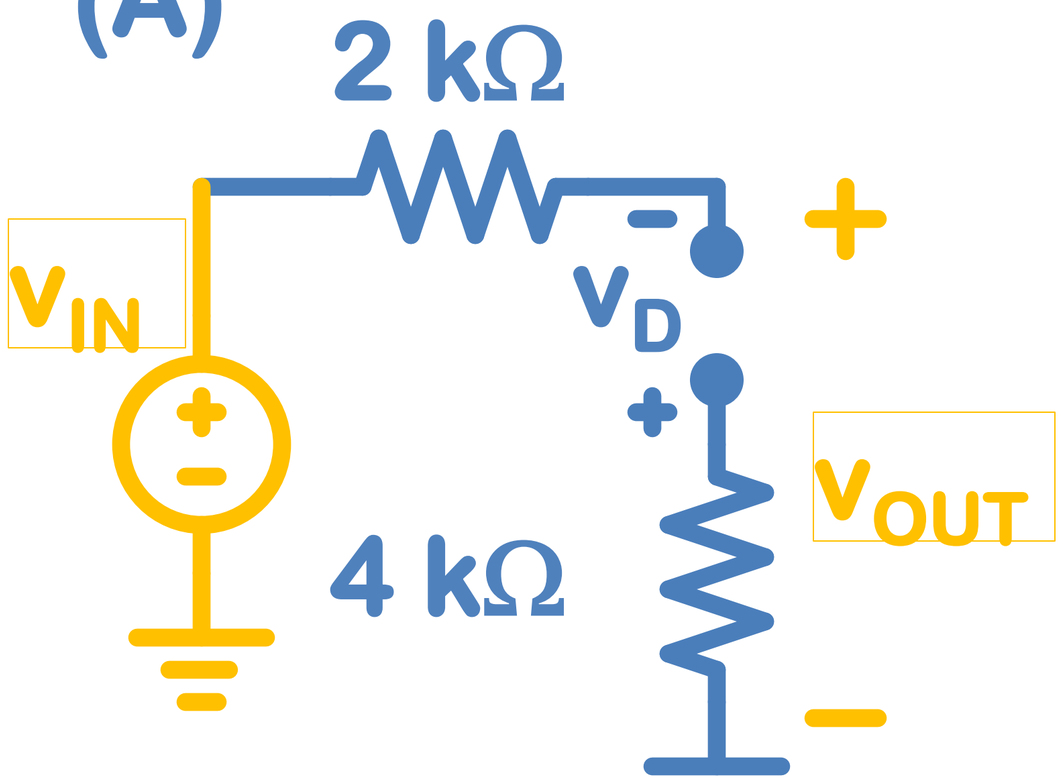
(C)



(D)

Find the equation and plot $v_{OUT}(v_{IN})$ for each circuit.

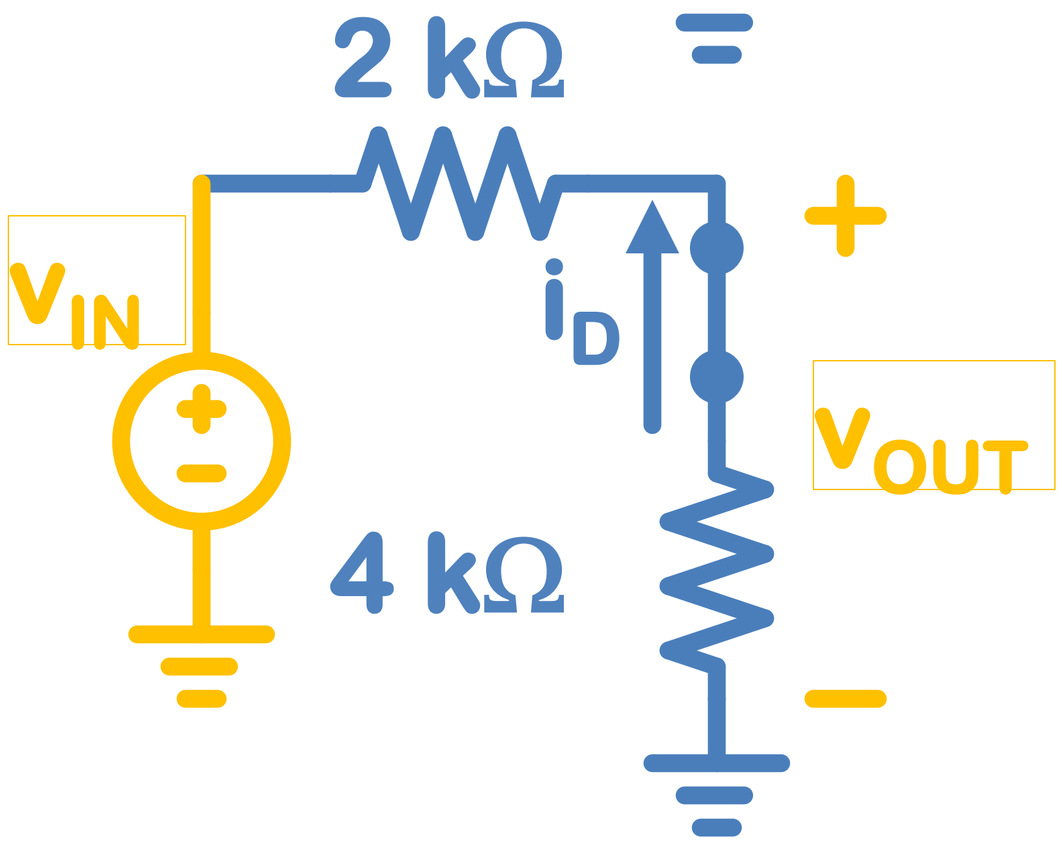
(A)



$v_{OUT}=v_{IN}$

$v_D=-v_{IN}$

$v_D<0$, when $v_{IN}>0$



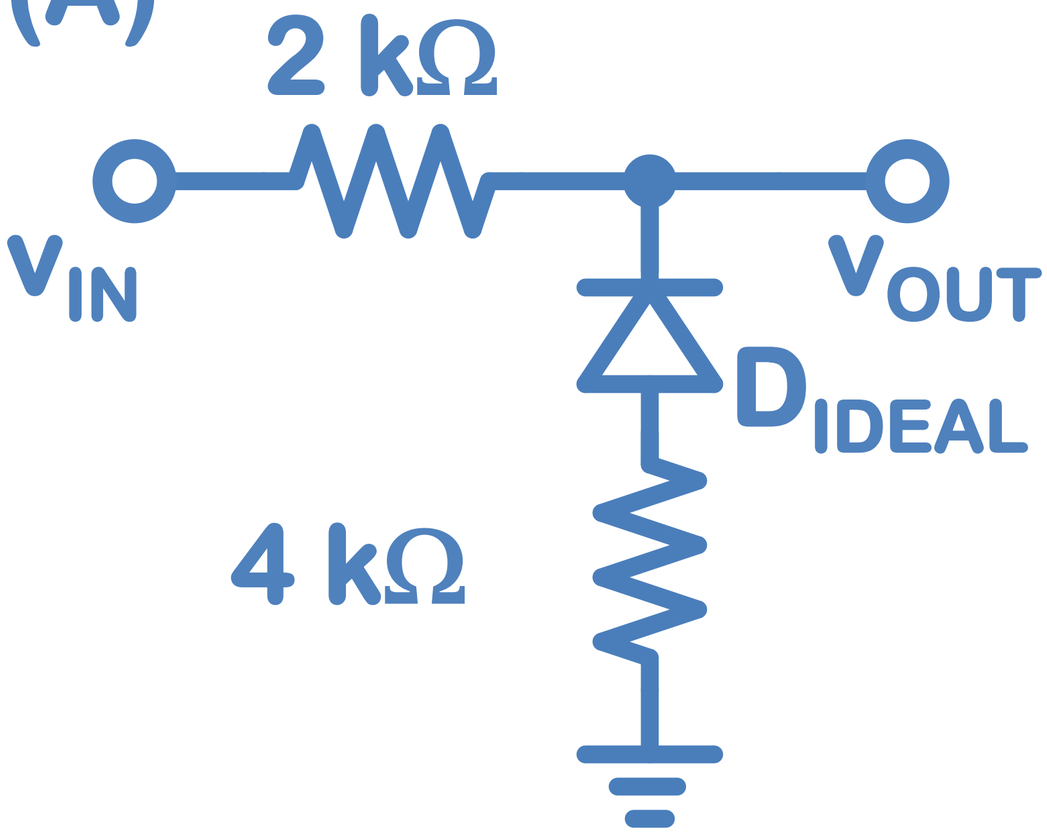
$v_{OUT}=0.67v_{IN}$

$i_D=-v_{IN}/6000$

$i_D>0$, when $v_{IN}<0$

Find the equation and plot $v_{OUT}(v_{IN})$ for each circuit.

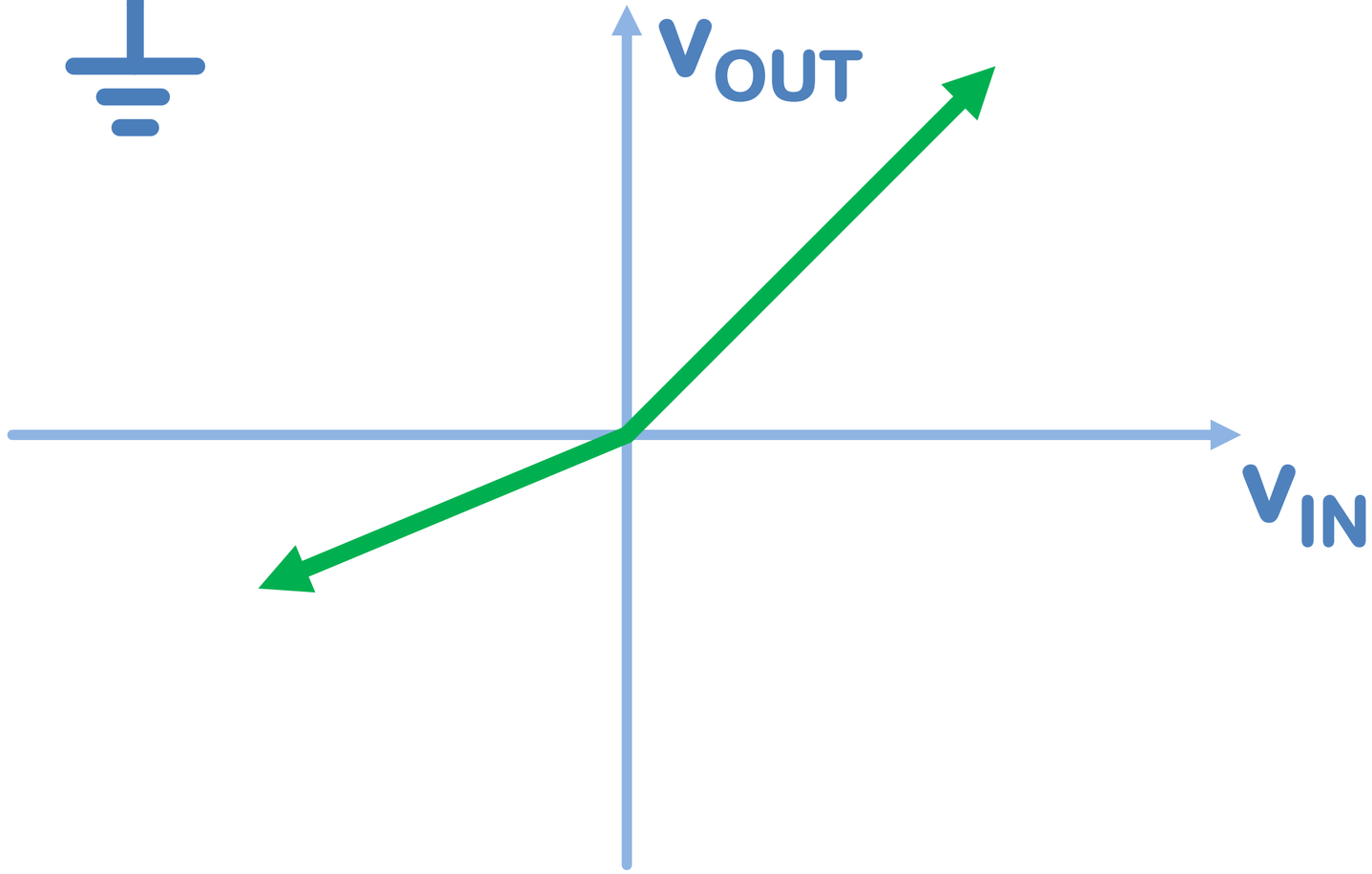
(A)



$v_{OUT}=.67v_{IN}$, when $v_{IN}<0$

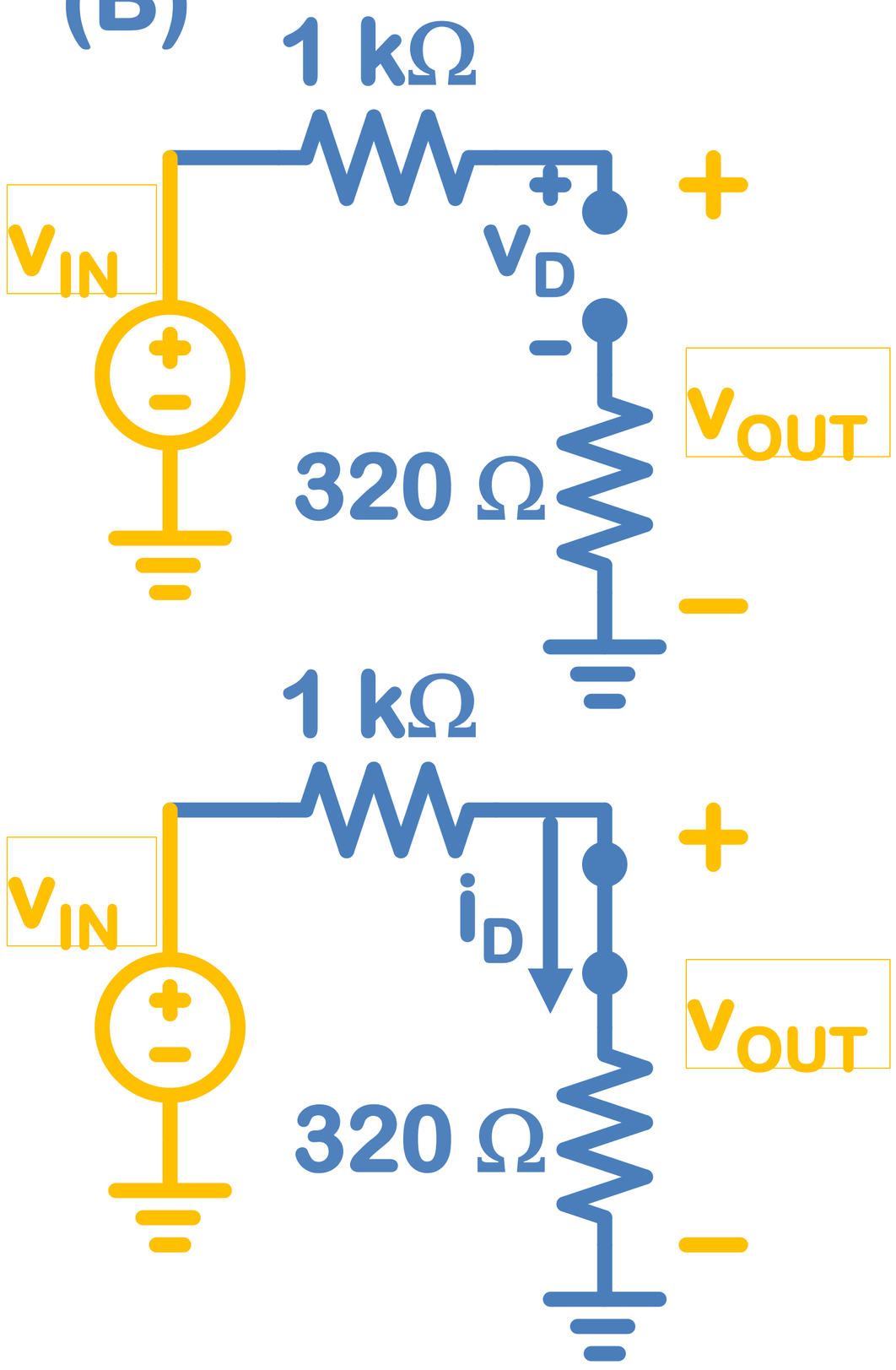
$v_{OUT}=v_{IN}$, when $v_{IN}>0$

**the equal can go with either case*



Find the equation and plot $v_{OUT}(v_{IN})$ for each circuit.

(B)



$v_{OUT}=v_{IN}$

$v_D=v_{IN}$

$v_D<0$, when $v_{IN}<0$

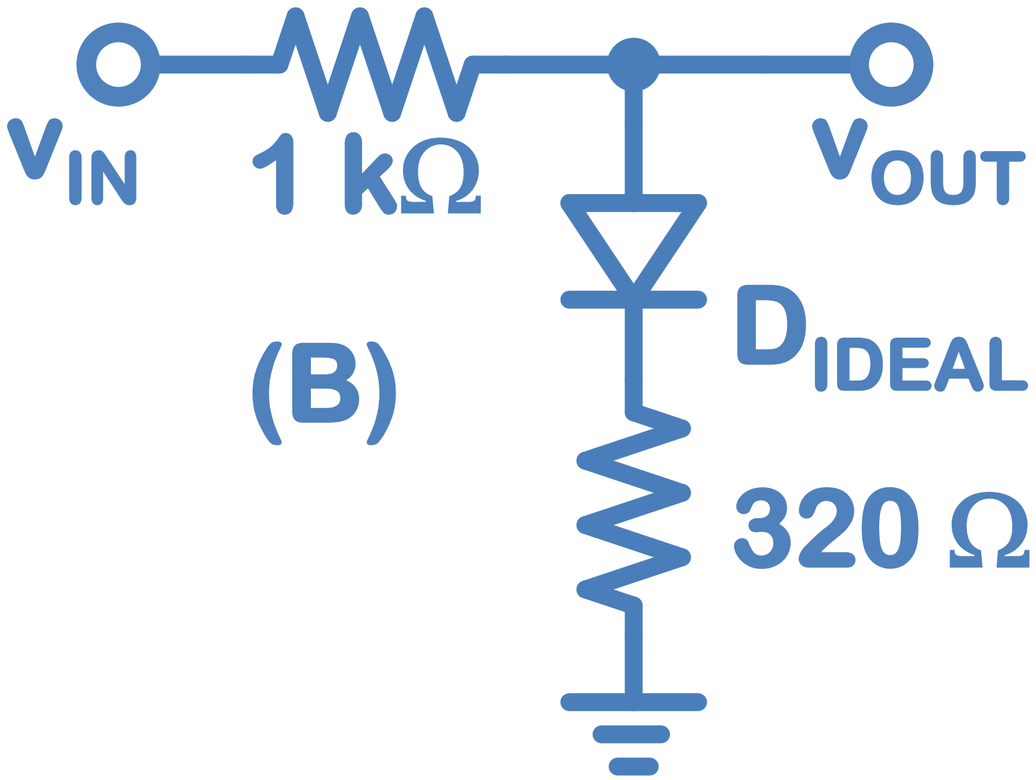
$v_{OUT}=0.24v_{IN}$

$i_D=v_{IN}/1320$

$i_D>0$, when $v_{IN}>0$

Find the equation and plot $v_{OUT}(v_{IN})$ for each circuit.

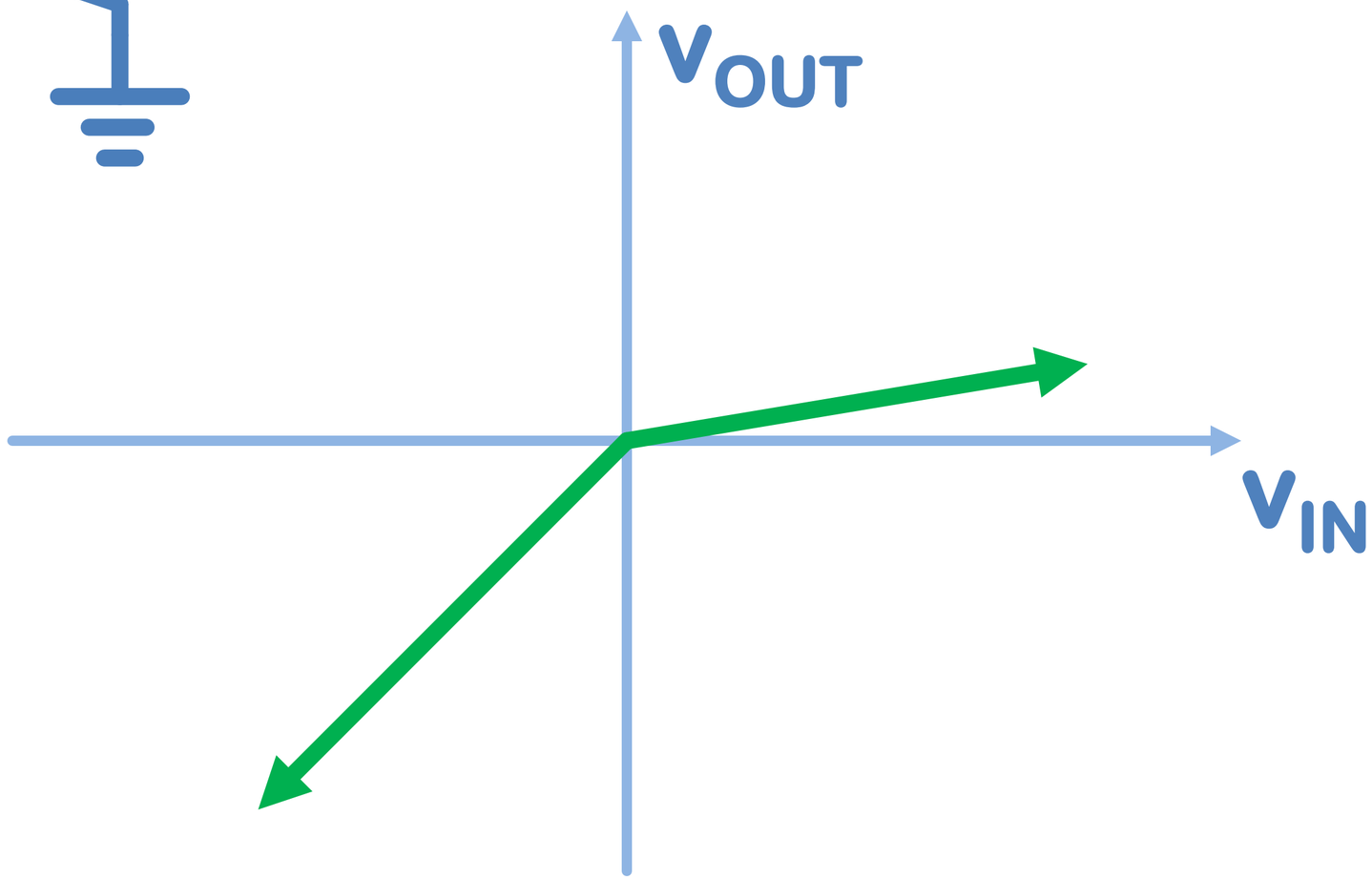
(B)



$v_{OUT}=v_{IN}$, when $v_{IN}<0$

$v_{OUT}=0.24v_{IN}$, when $v_{IN}>0$

**the equal can go with either case*



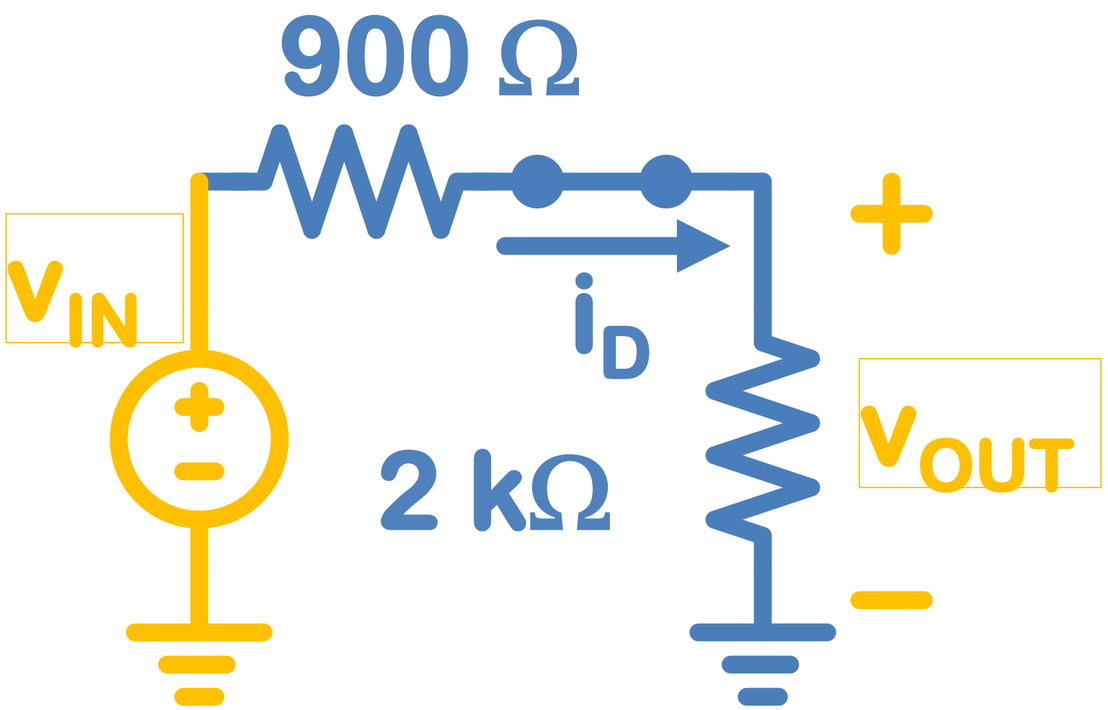
Find the equation and plot $v_{OUT}(v_{IN})$ for each circuit.

(C)

$v_{OUT}=0$

$v_D=v_{IN}$

$v_D<0$, when $v_{IN}<0$

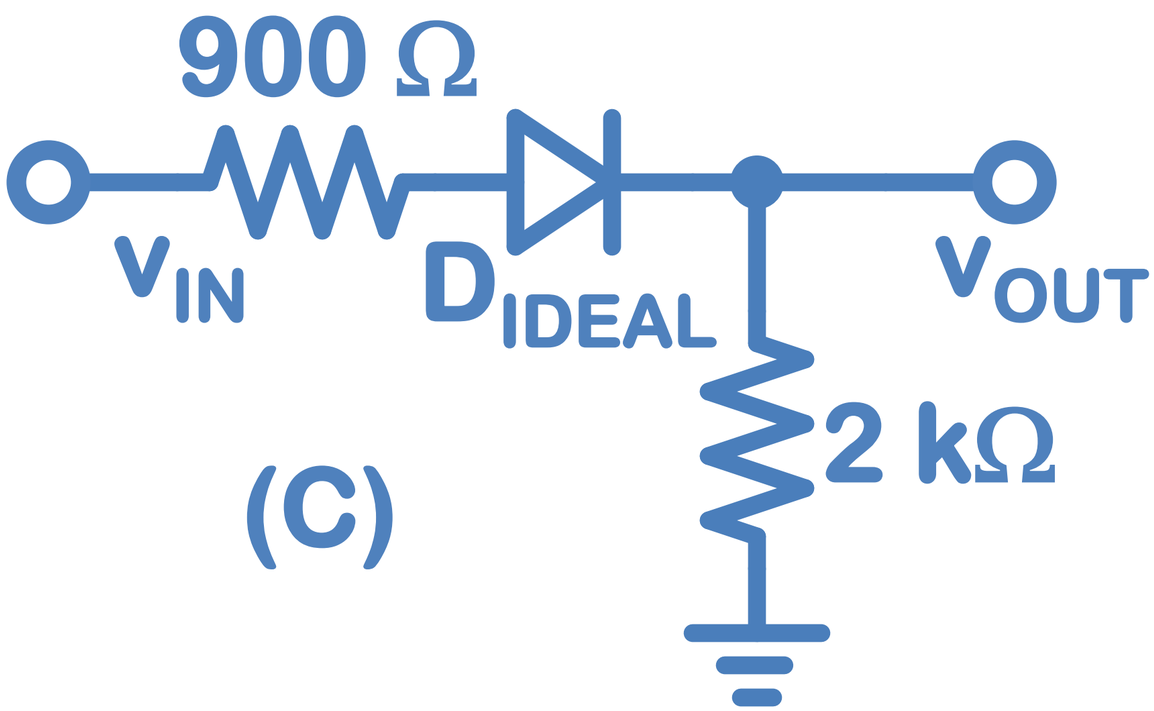


$v_{OUT}=0.7v_{IN}$

$i_D=v_{IN}/2900$

$i_D>0$, when $v_{IN}>0$

Find the equation and plot $v_{OUT}(v_{IN})$ for each circuit.

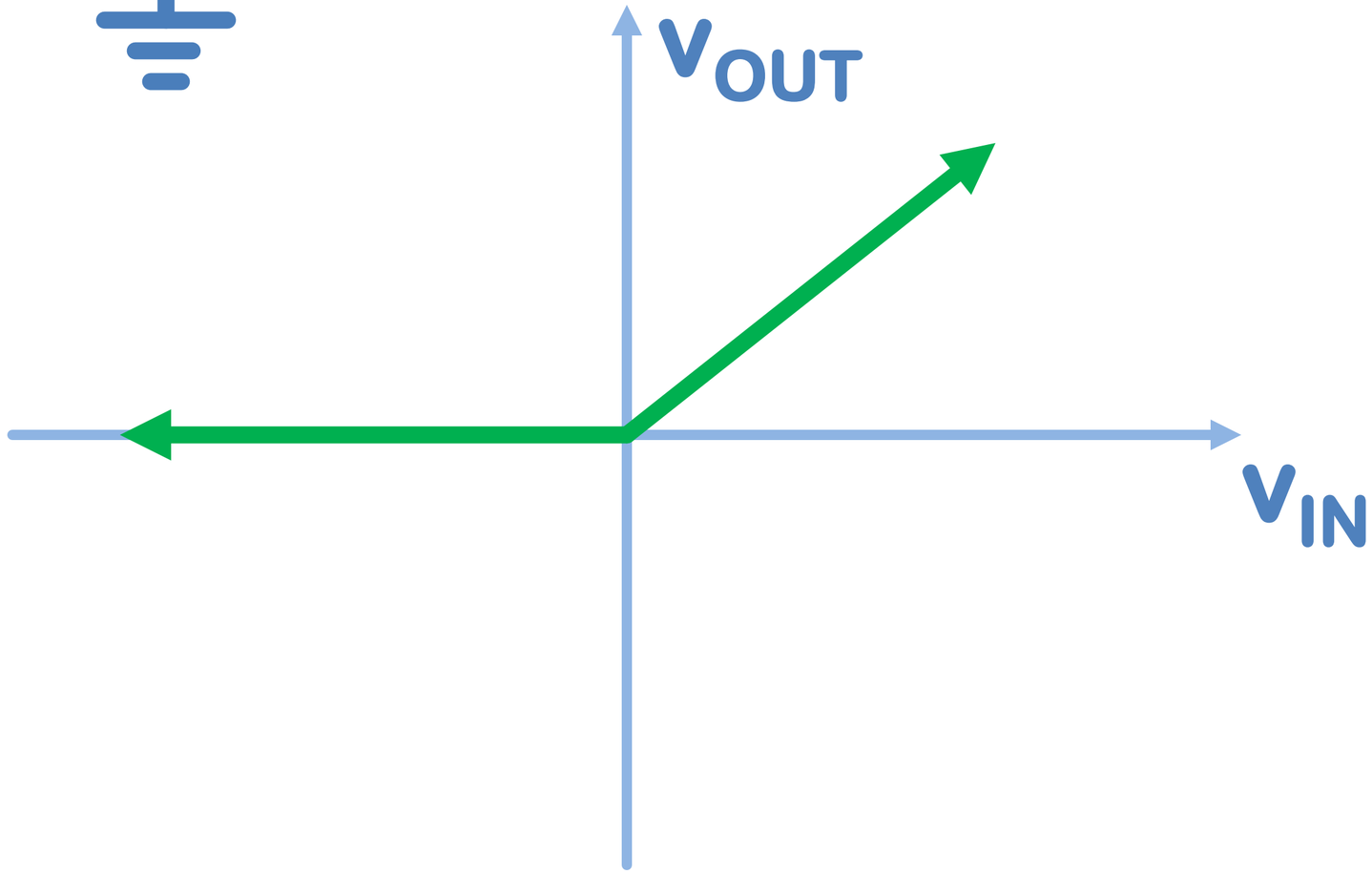


(C)

$v_{OUT}=0.7v_{IN}$, when $v_{IN}>0$

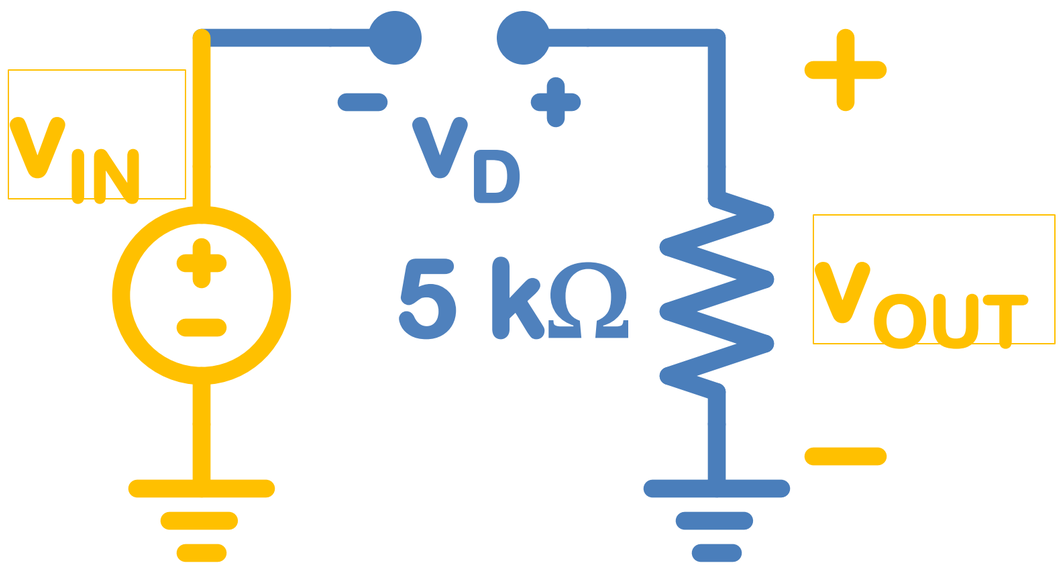
$v_{OUT}=0$, when $v_{IN}<0$

**the equal can go with either case*



Find the equation and plot $v_{OUT}(v_{IN})$ for each circuit.

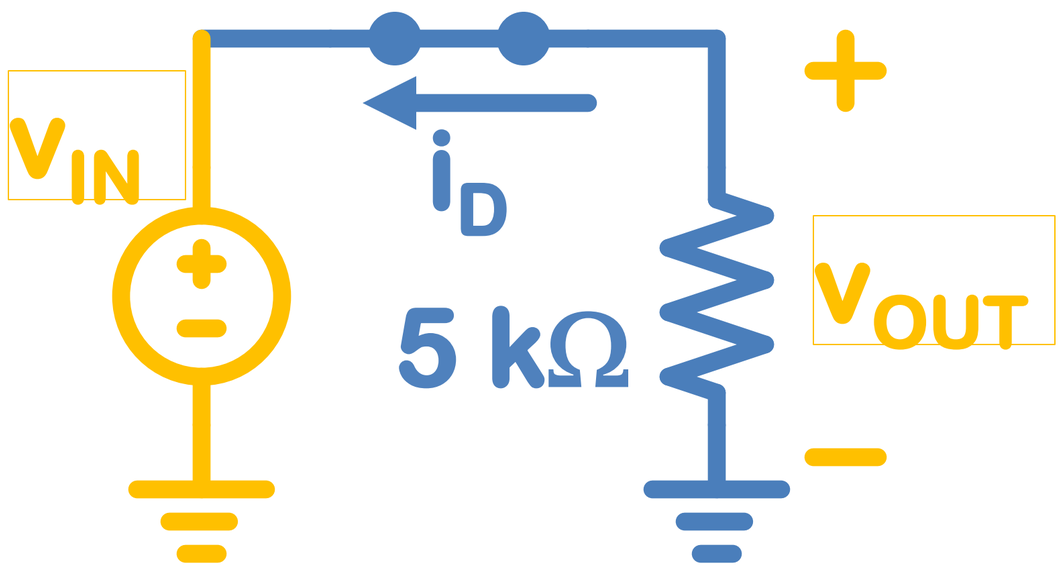
(D)



$v_{OUT}=0$

$v_D=-v_{IN}$

$v_D<0$, when $v_{IN}>0$



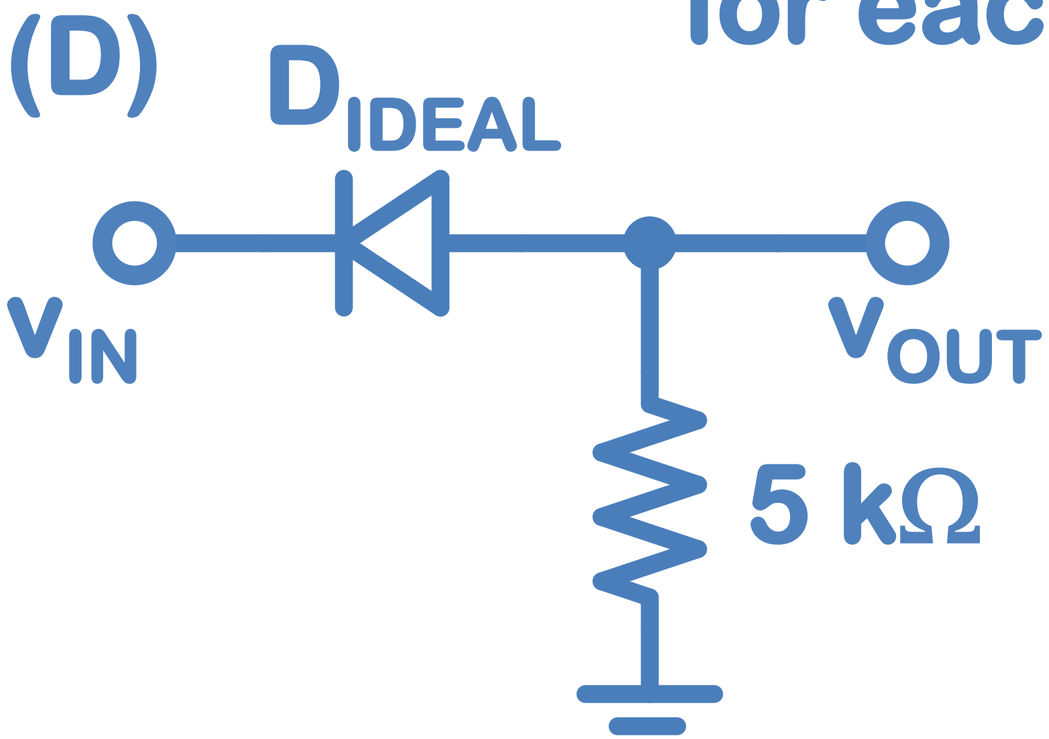
$v_{OUT}=v_{IN}$

$i_D=-v_{IN}/5000$

$i_D>0$, when $v_{IN}<0$

Find the equation and plot $v_{OUT}(v_{IN})$ for each circuit.

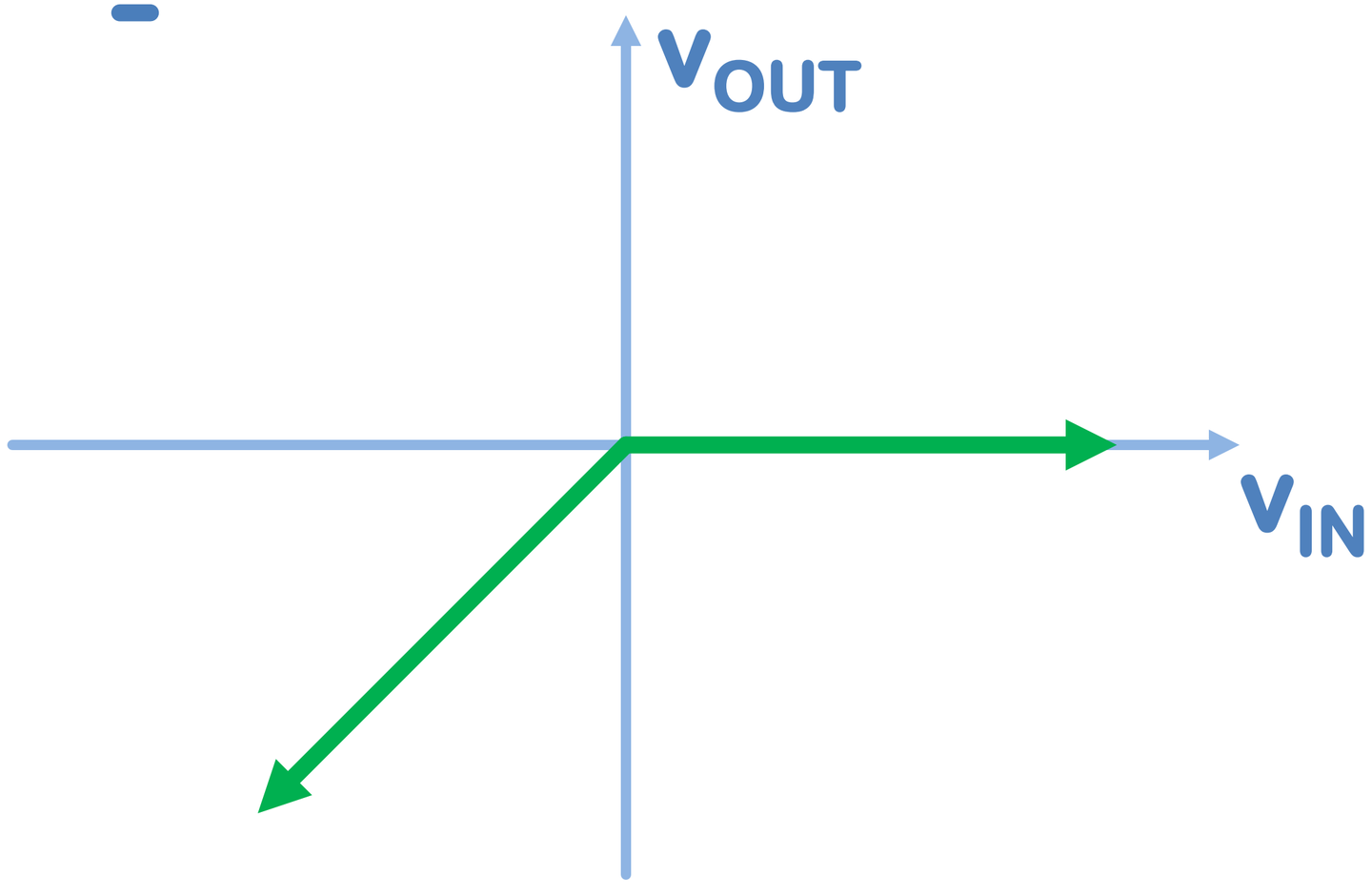
(D)



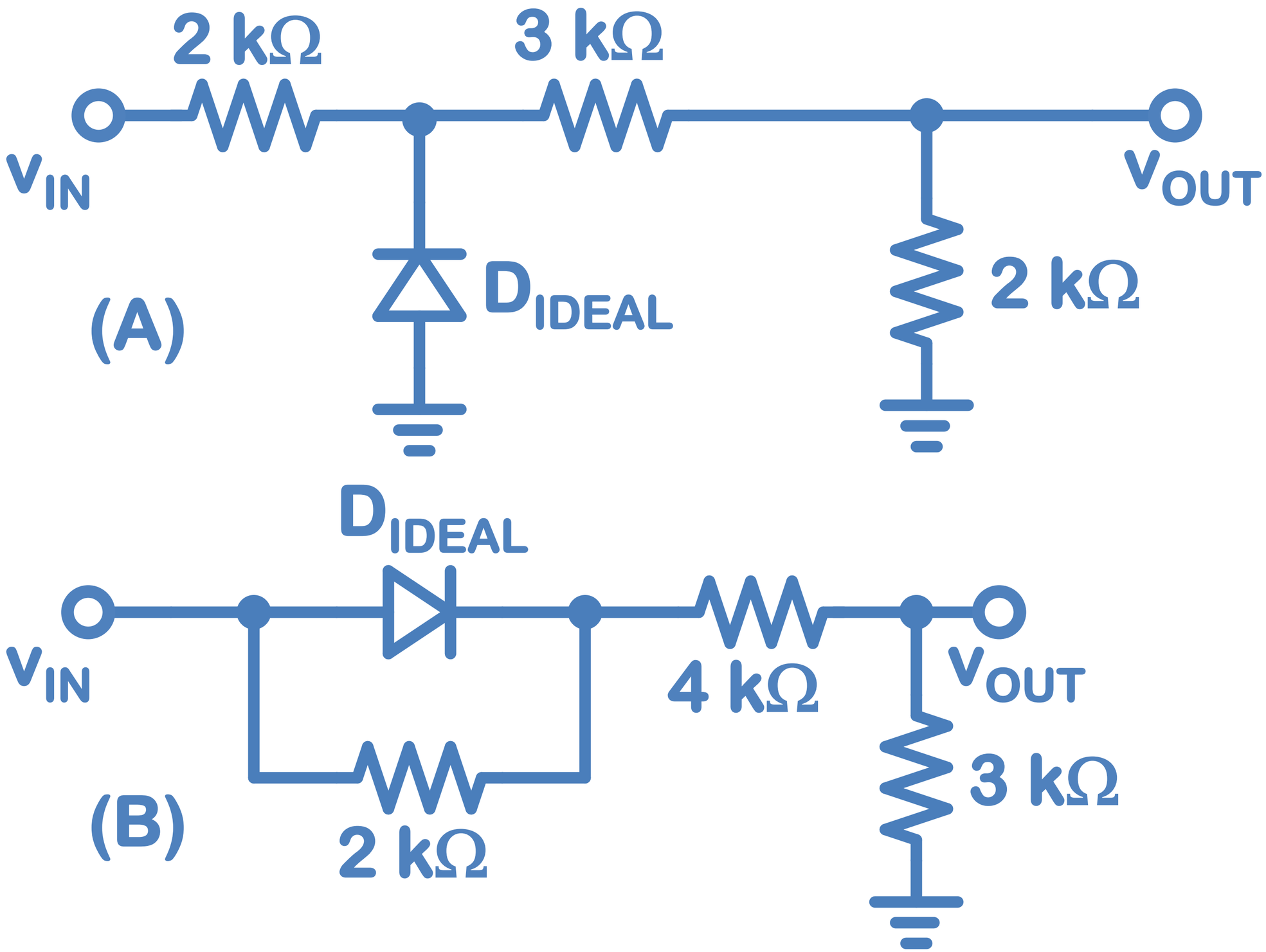
$v_{OUT}=0$, when $v_{IN}>0$

$v_{OUT}=v_{IN}$, when $v_{IN}<0$

**the equal can go with either case*



a) Find the equation and plot $v_{OUT}(v_{IN})$ for each circuit.
b) Plot the $v_{OUT}(t)$ if $v_{IN}(t)=2\sin(2\pi t)$ for each circuit.



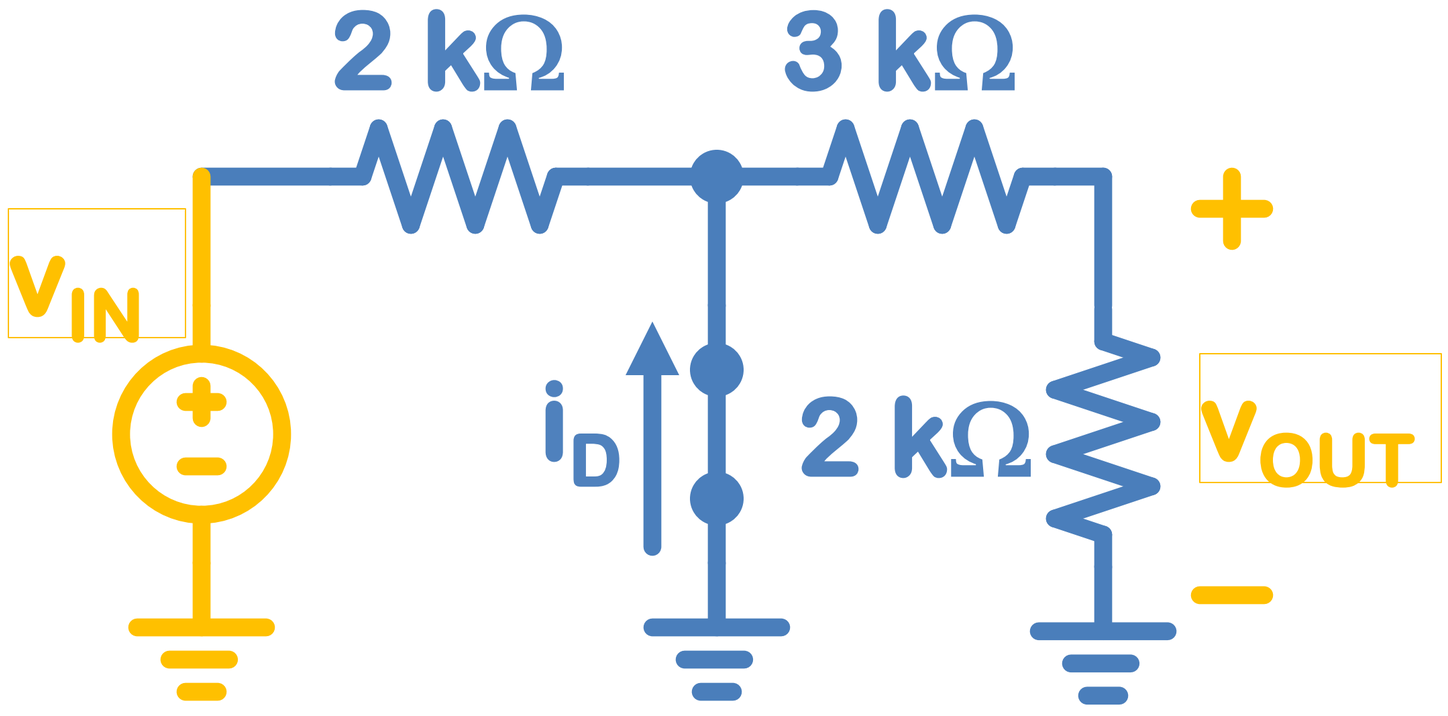
Find the equation and plot $v_{OUT}(v_{IN})$ for each circuit.

(A)

$v_{OUT}=0.286v_{IN}$

$v_D=-0.714v_{IN}$

$v_D<0$, when $v_{IN}>0$

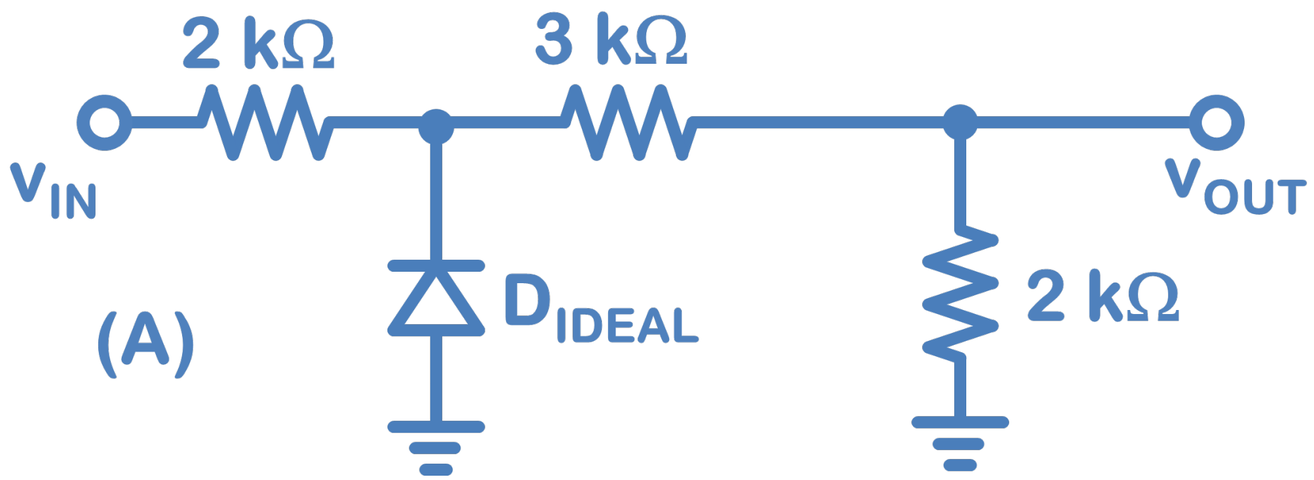


$v_{OUT}=0$

$i_D=-v_{IN}/2000$

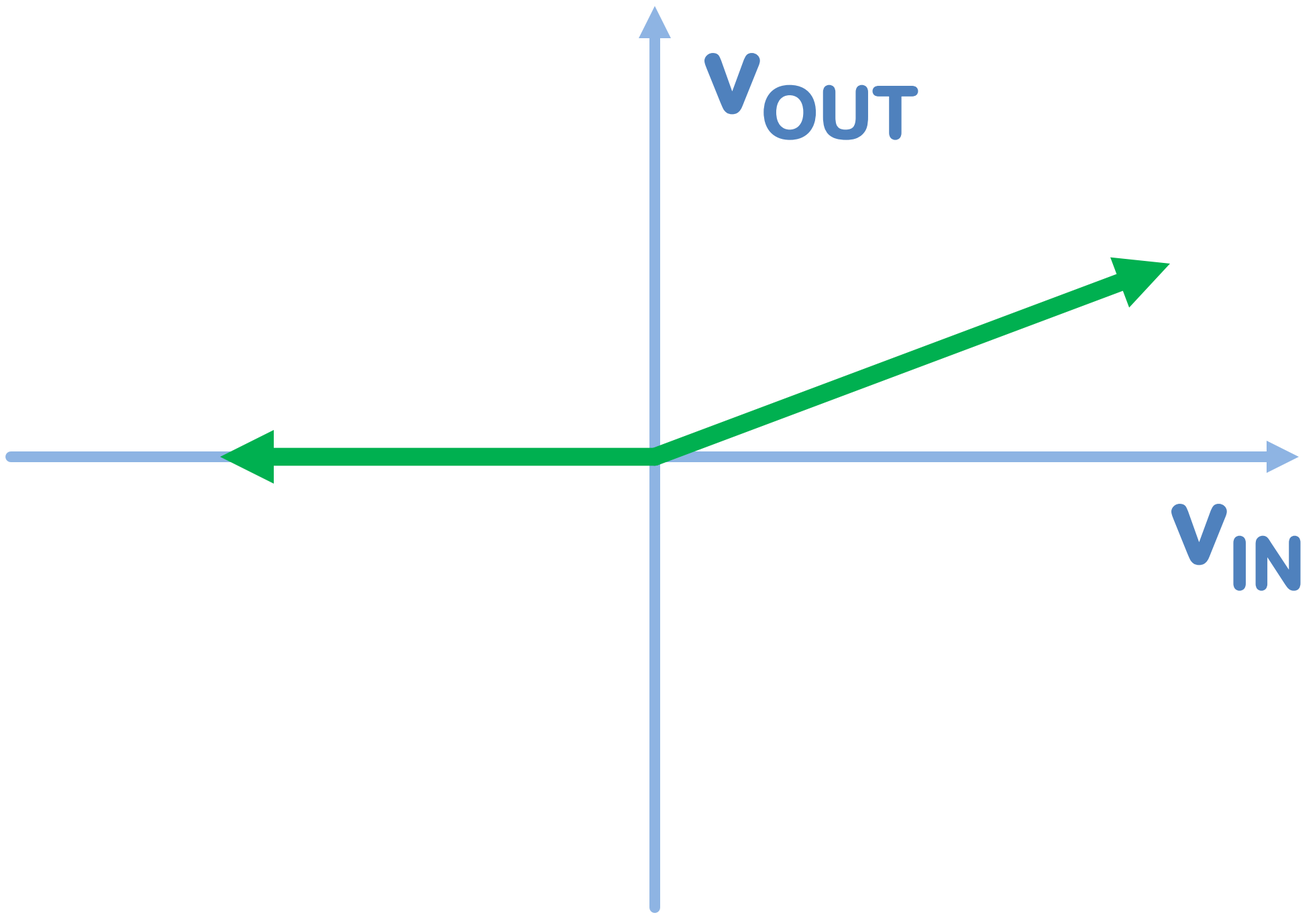
$i_D>0$, when $v_{IN}<0$

Find the equation and plot $v_{OUT}(v_{IN})$ for each circuit.



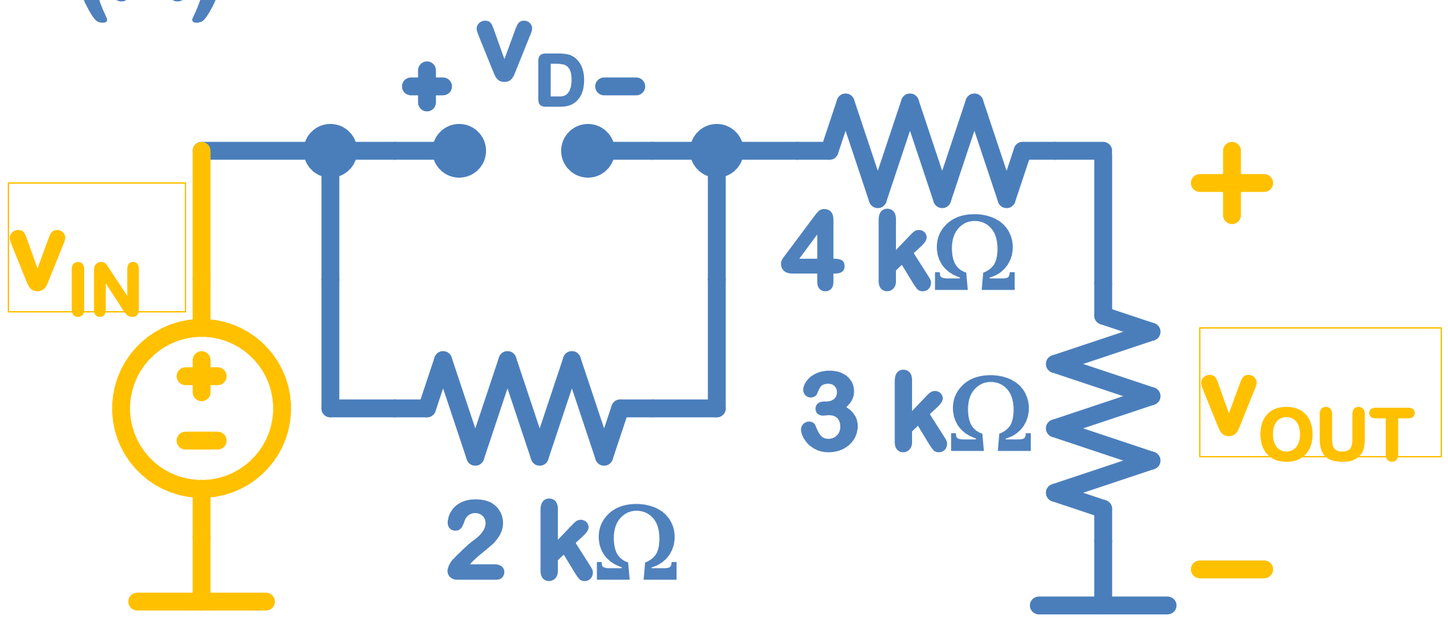
$v_{OUT}=0$, when $v_{IN}<0$
$v_{OUT}=0.286v_{IN}$, when $v_{IN}>0$

the equal can go with either case



Find the equation and plot $v_{OUT}(v_{IN})$ for each circuit.

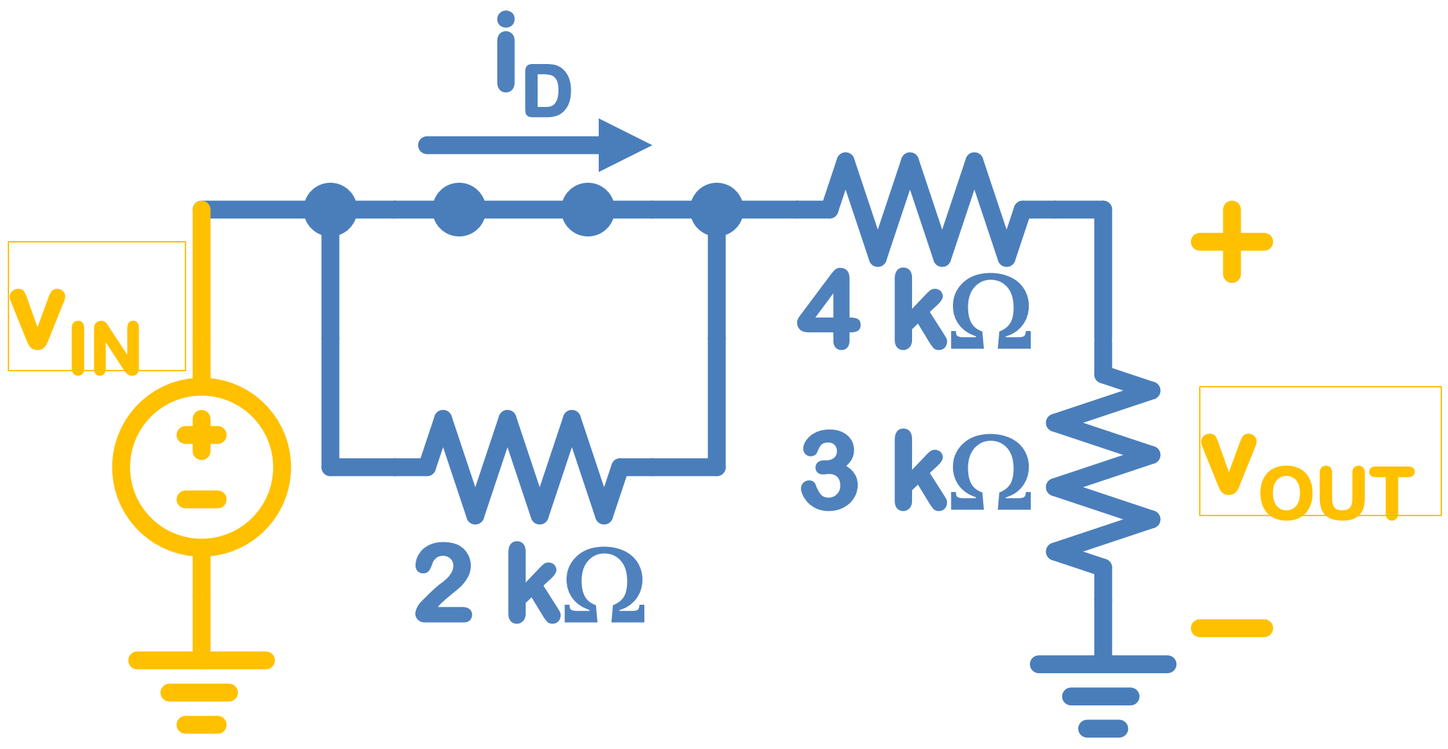
(A)



$v_{OUT}=(3/9)v_{IN}$

$v_D=(2/9)v_{IN}$

$v_D<0$, when $v_{IN}<0$

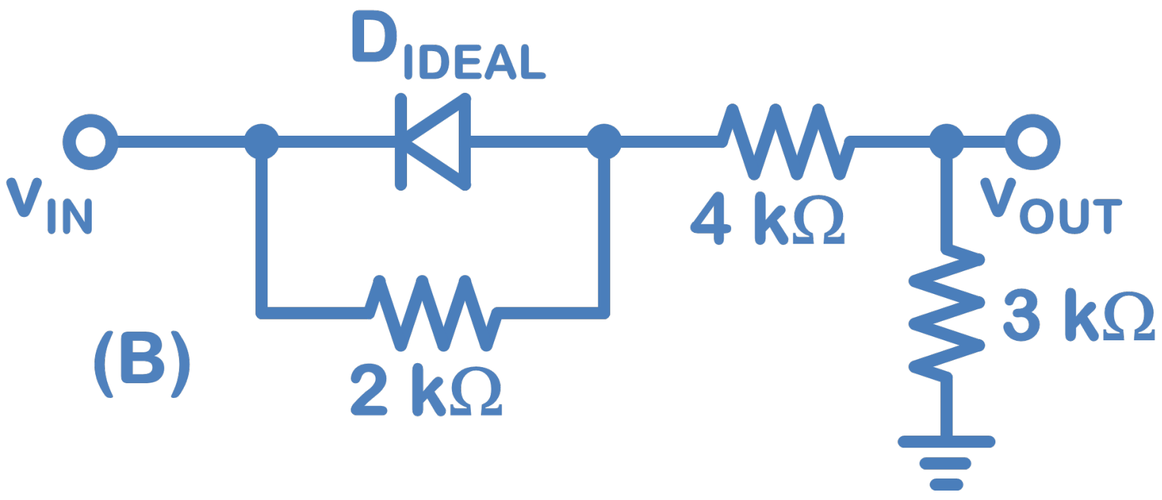


$v_{OUT}=(3/7)v_{IN}$

$i_D=v_{IN}/7000$

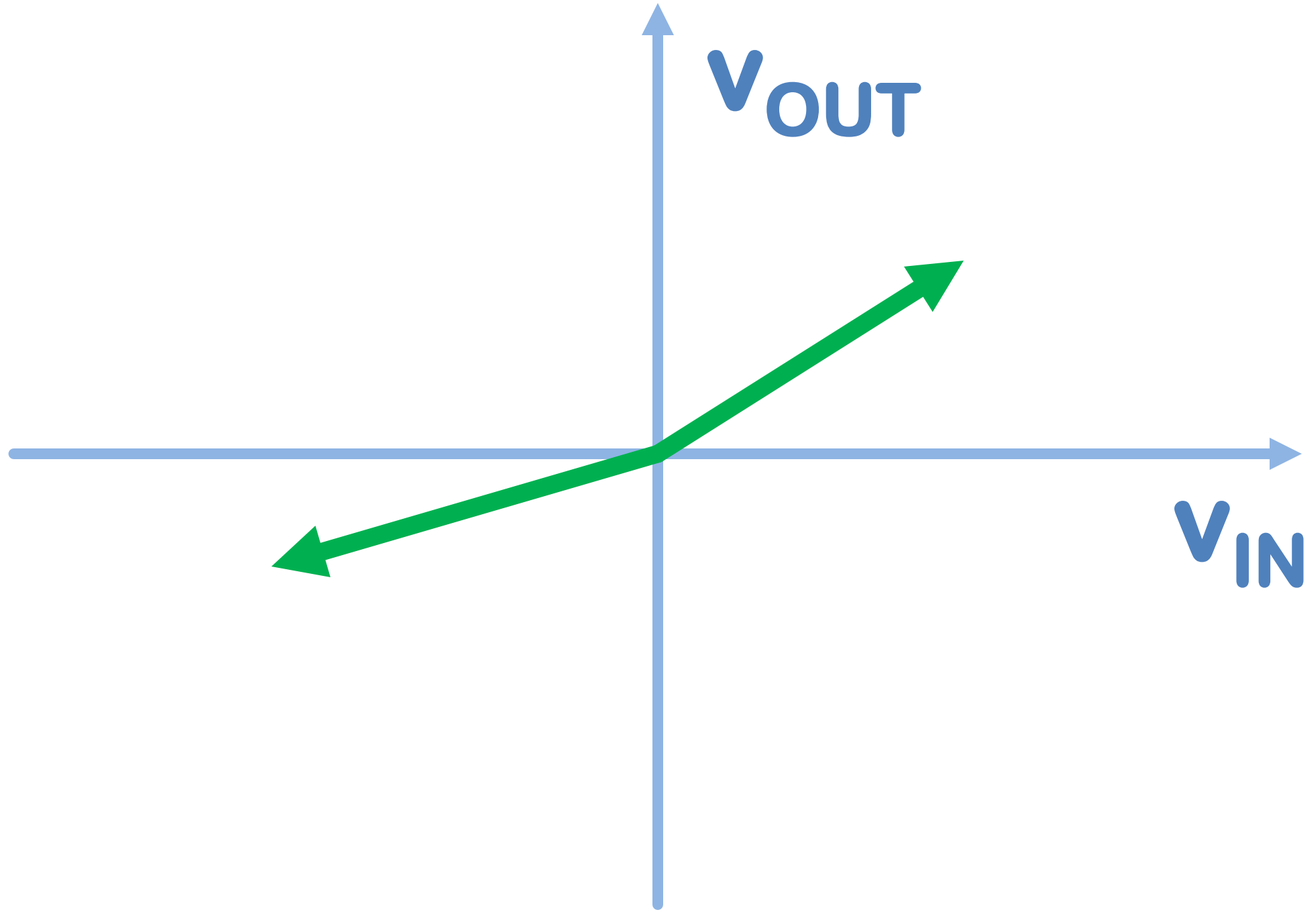
$i_D>0$, when $v_{IN}>0$

Find the equation and plot $v_{OUT}(v_{IN})$ D_{IDEAL} for each circuit.



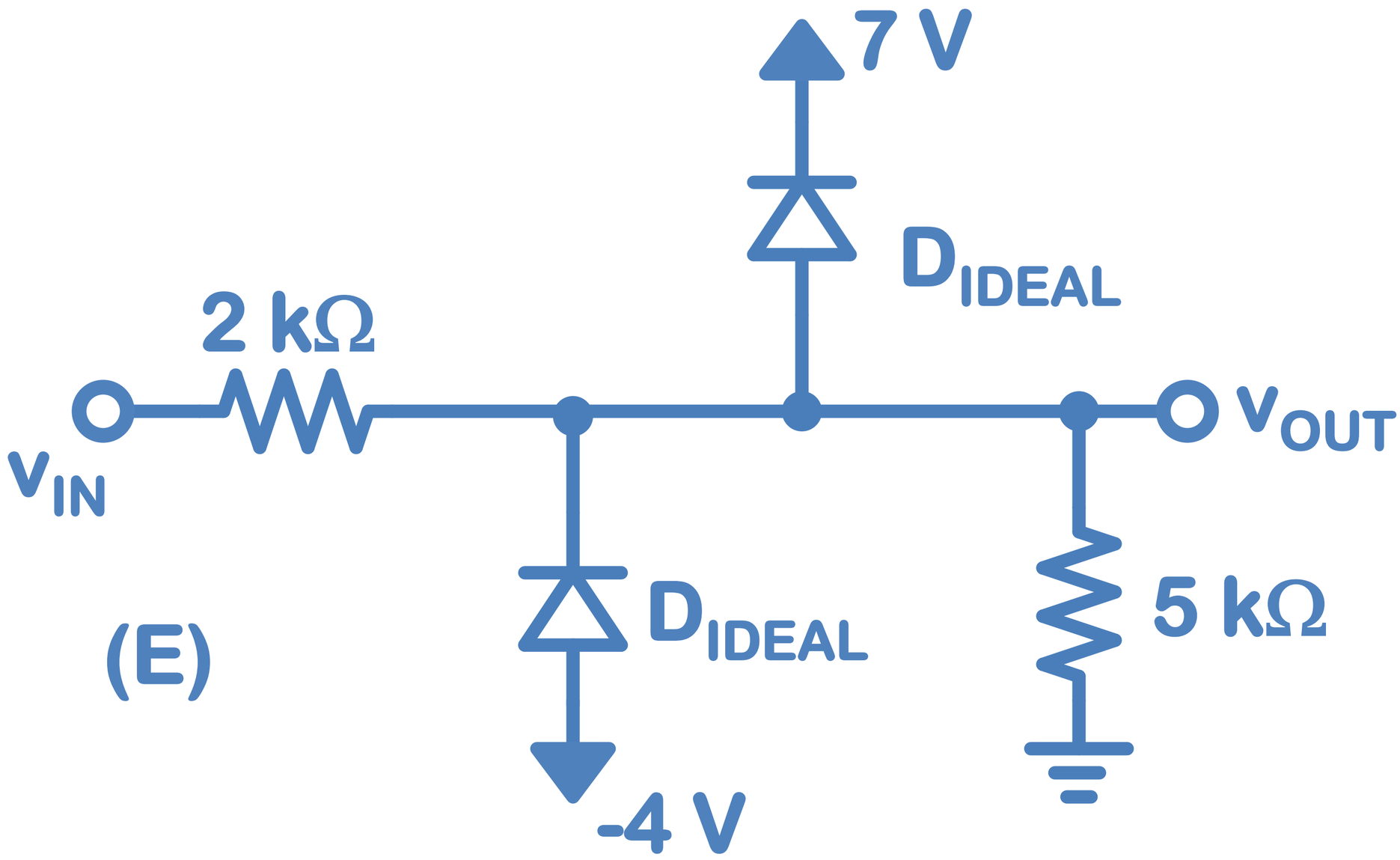
$v_{OUT}=(1/3)v_{IN}$, when $v_{IN}<0$
$v_{OUT}=(3/7)v_{IN}$, when $v_{IN}>0$

**the equal can go with either case*



Problem 4.

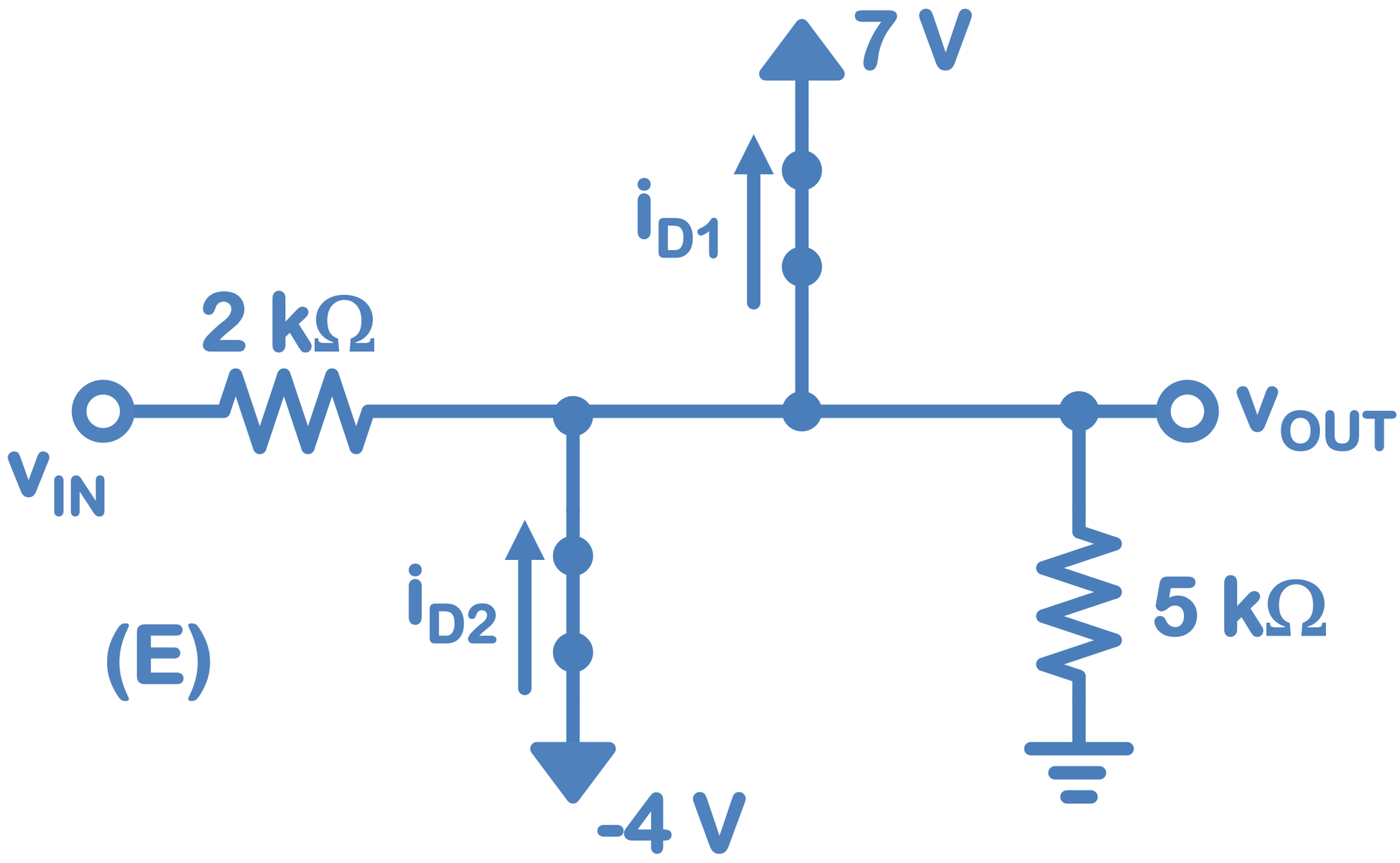
a) Find the equation and plot $v_{OUT}(v_{IN})$ for the circuit.



(E)

Problem 4.

a) Find the equation and plot $v_{OUT}(v_{IN})$ for the circuit.

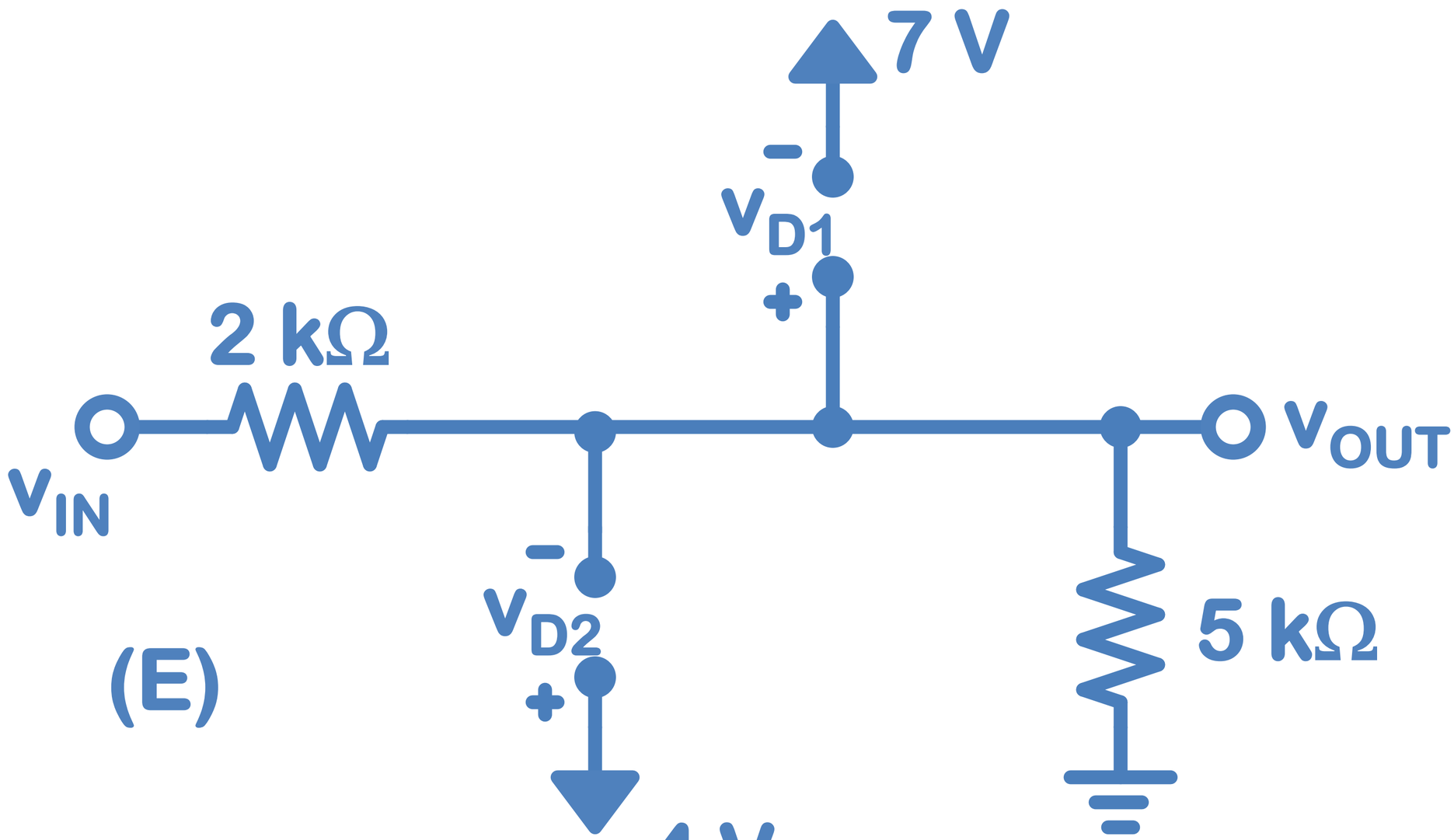


$i_{D1}=i_{D2}=-11/0=$neg. infinity

Never > 0 for FB,FB

Problem 4.

a) Find the equation and plot $v_{OUT}(v_{IN})$ for the circuit.



(E)

$v_{OUT} = (5/7)v_{IN}$

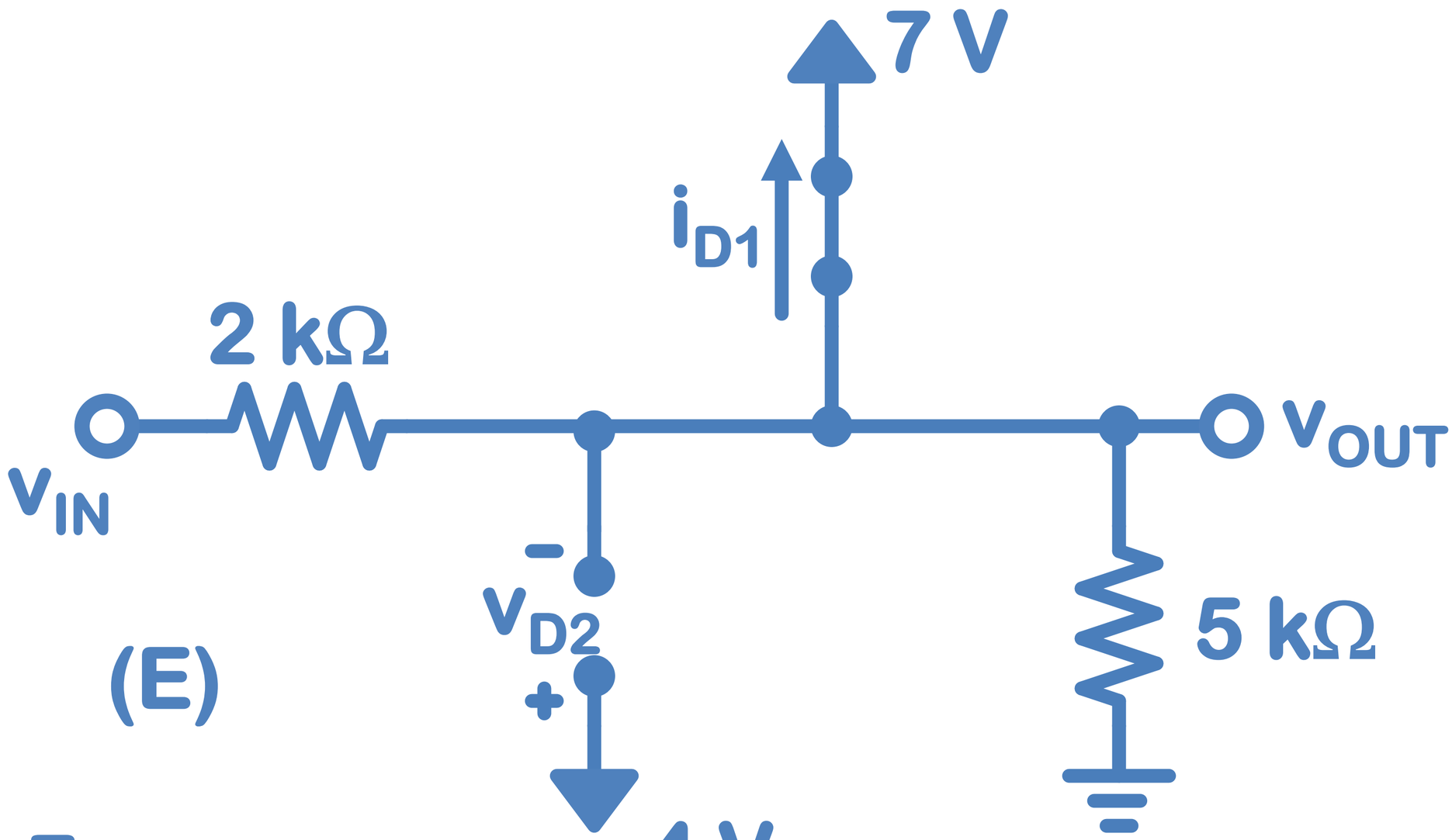
$v_{D1} = (5/7)v_{IN}-7<0;\ v_{IN}<(49/5)$

$v_{D2} = -4-(5/7)v_{IN}<0;\ v_{IN}>-(28/5)$

$-(28/5)<v_{IN}<(49/5)$

Problem 4.

a) Find the equation and plot $v_{OUT}(v_{IN})$ for the circuit.



(E)

$v_{OUT} = 7$

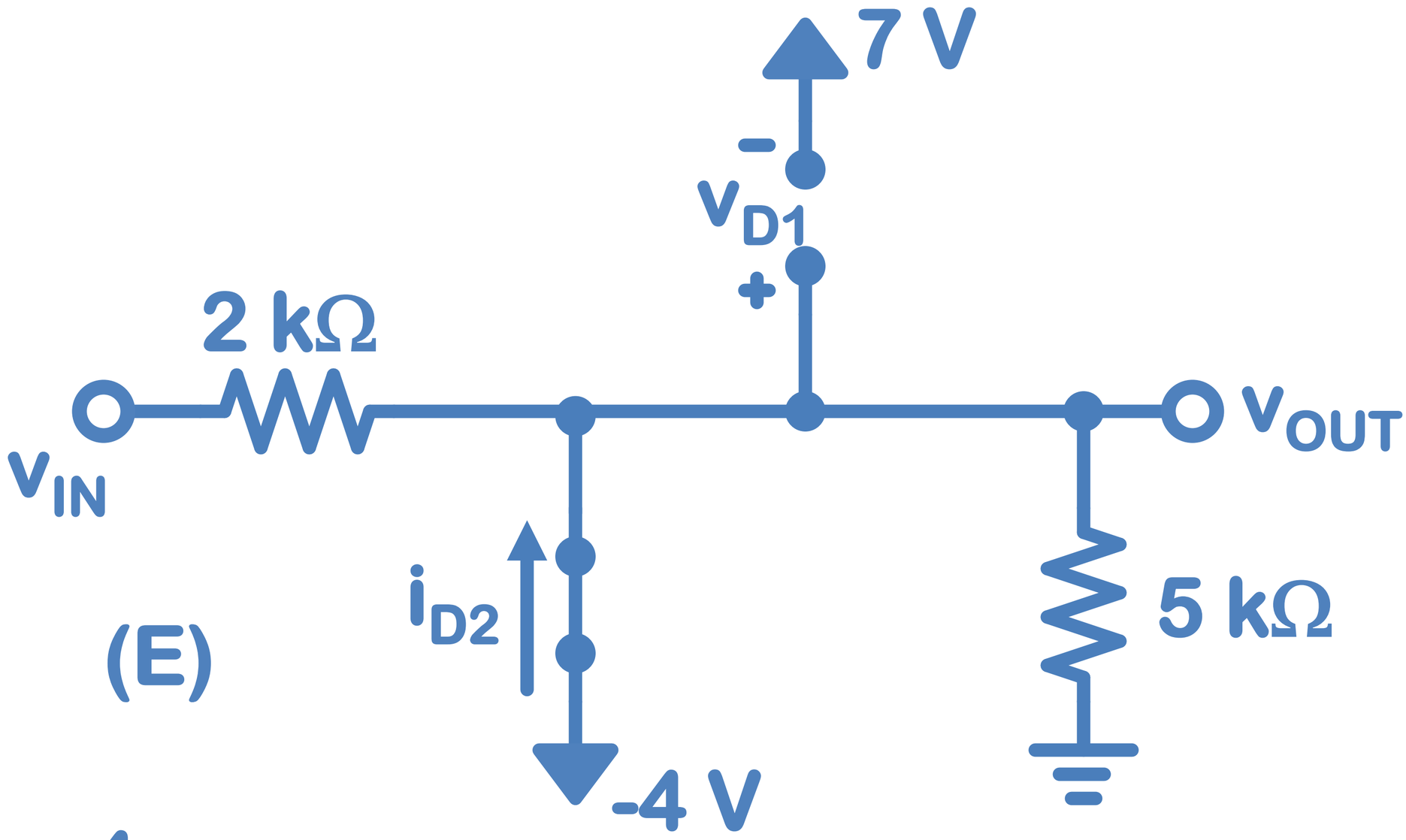
$i_{D1} = (v_{IN}-7)/2000 + -7/5000>0;\ v_{IN}>49/5$

$v_{D2} = -4-7<0$; always

$v_{IN}>(49/5)$

Problem 4.

a) Find the equation and plot $v_{OUT}(v_{IN})$ for the circuit.



$v_{OUT} = -4$

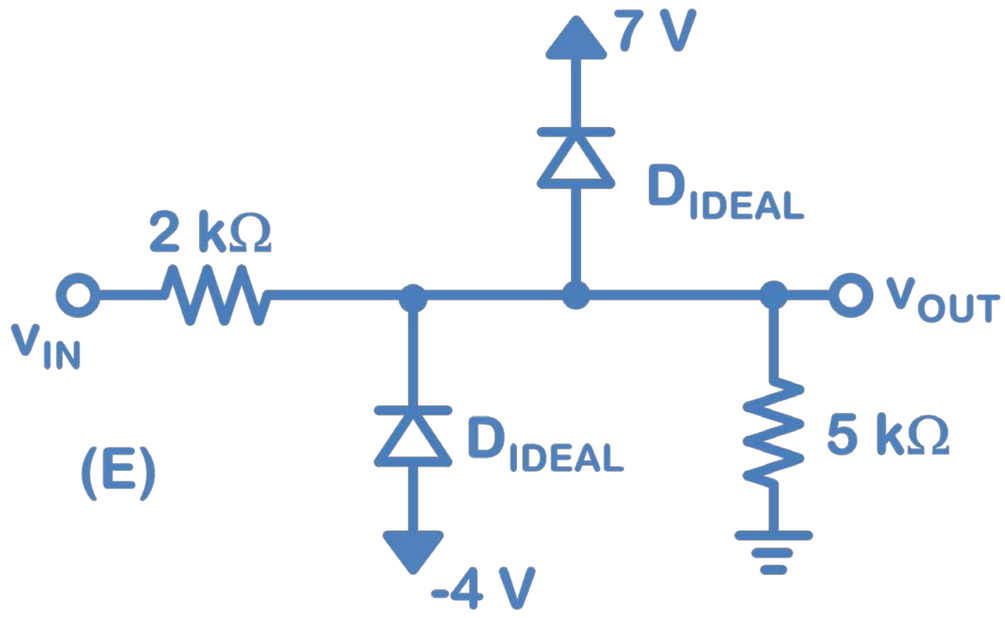
$v_{D1} = -4-7<0$; always

$i_{D2} = (-4-v_{IN})/2000-4/5000>0$; $v_{IN}<-(28/5)$

$v_{IN}<-(28/5)$

Problem 4.

a) Find the equation and plot $v_{OUT}(v_{IN})$ for the circuit.



$v_{OUT} = -4$, when $v_{IN} < -28/5$

$v_{OUT}=(5/7)v_{IN}$, when $-28/5<v_{IN}<49/7$

$v_{OUT}=7$, when $v_{IN}>49/7$

**the equal can go with either case*