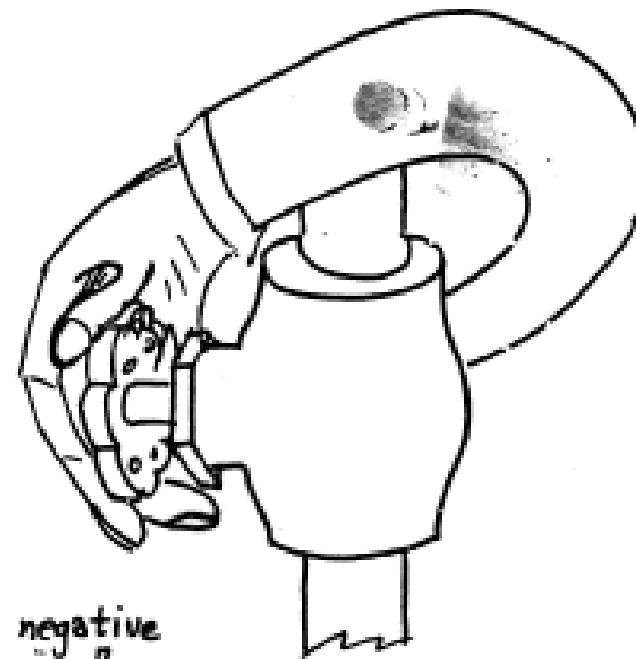
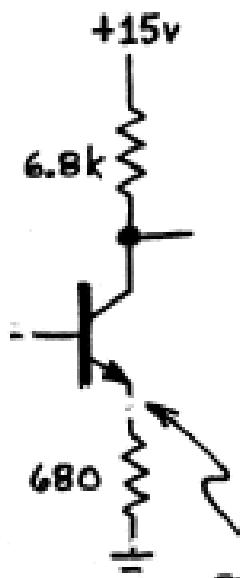


# Transistor Feedback



sneaky negative  
feedback! ... circuit reaches back  
to adjust value!



$$\Delta E = i_1(R_1 + R_2)$$

$$\Delta E = K[i_1(R_1 + R_2)]$$

$$\frac{\Delta E}{E} = K \quad \text{or} \quad \frac{\Delta E}{E} = \frac{K}{1+K}$$

$$\frac{\Delta E}{E} = K \quad \text{or} \quad \frac{\Delta E}{E} = \frac{K}{1+K}$$

$$\frac{\Delta E}{E} = \frac{K}{1+K} = I + \frac{1}{R}$$

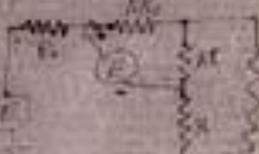
$$\frac{\Delta E}{E} = I + \frac{1}{R}$$

$$I = I + \frac{1}{R}$$

$$K = \frac{1}{I - 1}$$

$$K = \frac{1}{I - 1}$$

$$K = \frac{1}{I - 1}$$



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From Bell &amp; Howell Co.

Patent Commission Bureau  
BOSTON, MASS.  
P. O. BOX 1000  
TELEGRAMS: PATENT BUREAU  
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Disclosed or principle  
E. E. C. Blessing Aug 6, 1927

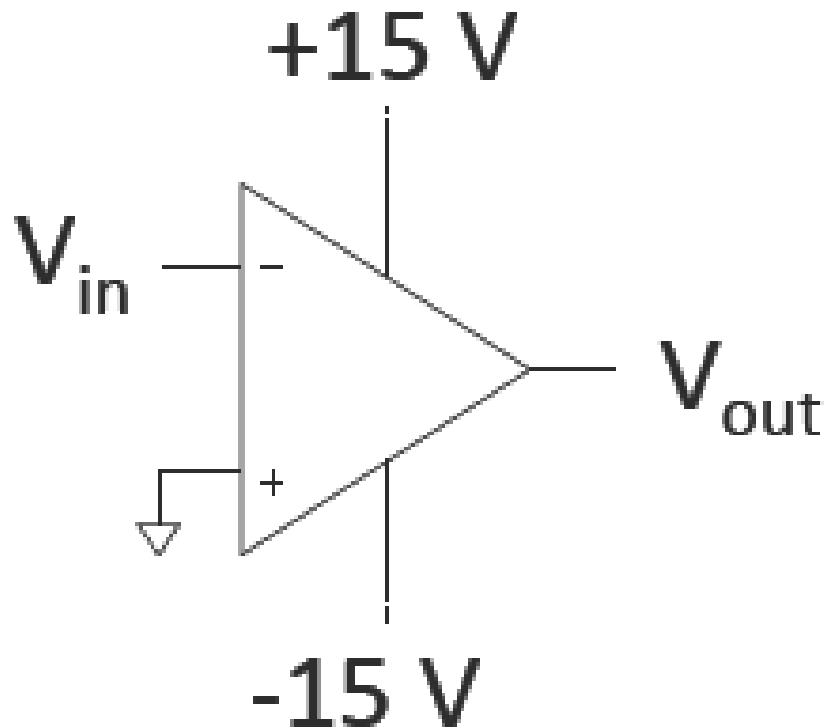
H. S. Black Aug 18, 1927

Entered, U. S. Patent Office  
Serial No. 300,000  
Filed June 1, 1927  
Inventor, E. E. C. Blessing

Witnessed and subscribed  
E. E. C. Blessing  
Aug 18, 1927

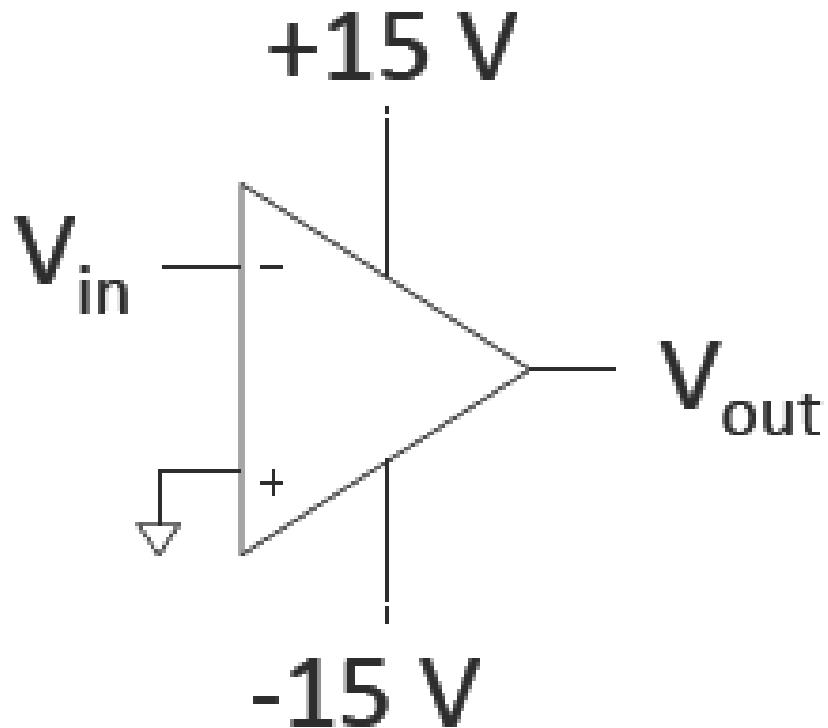
- If  $V_{in} = 1 \text{ V}$  what is  $V_{out}$ ?

- A) 0V
- B) 1V
- C) -1V
- D) 15V
- E) -15V



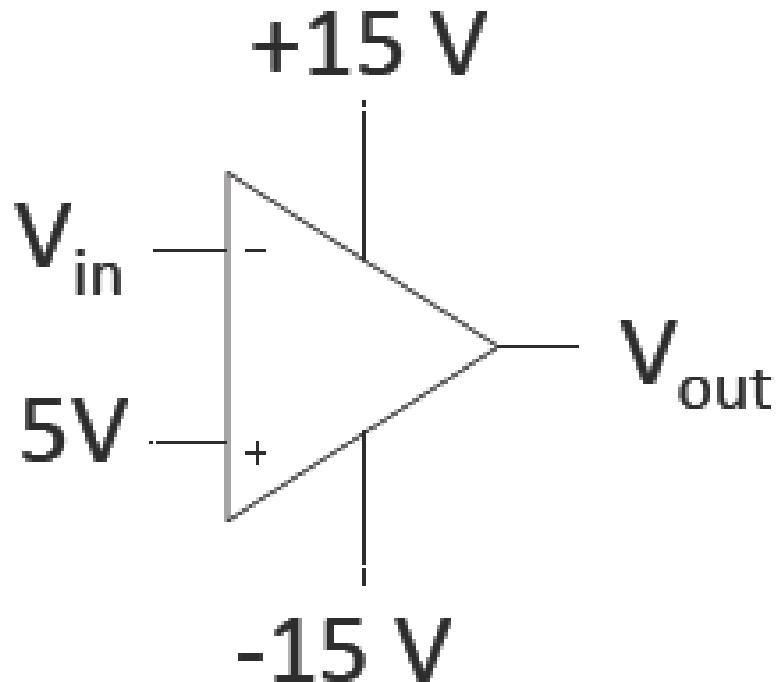
- If  $V_{in} = 1 \text{ V}$  what is  $V_{out}$ ?

- A) 0V
- B) 1V
- C) -1V
- D) 15V
- E) -15V



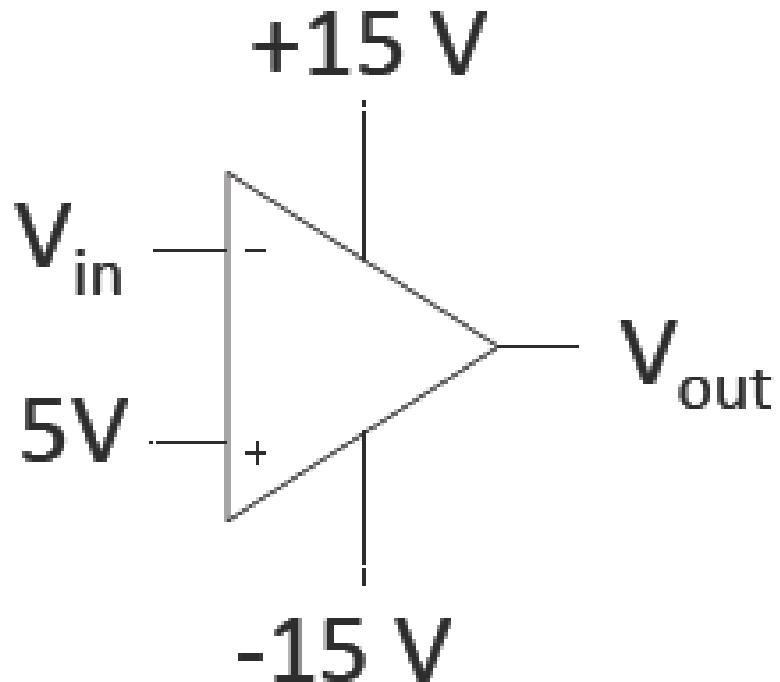
- If  $V_{in} = 1 \text{ V}$  what is  $V_{out}$ ?

- A) 0V
- B) B) 1V
- C) -1V
- D) 15V
- E) -15V



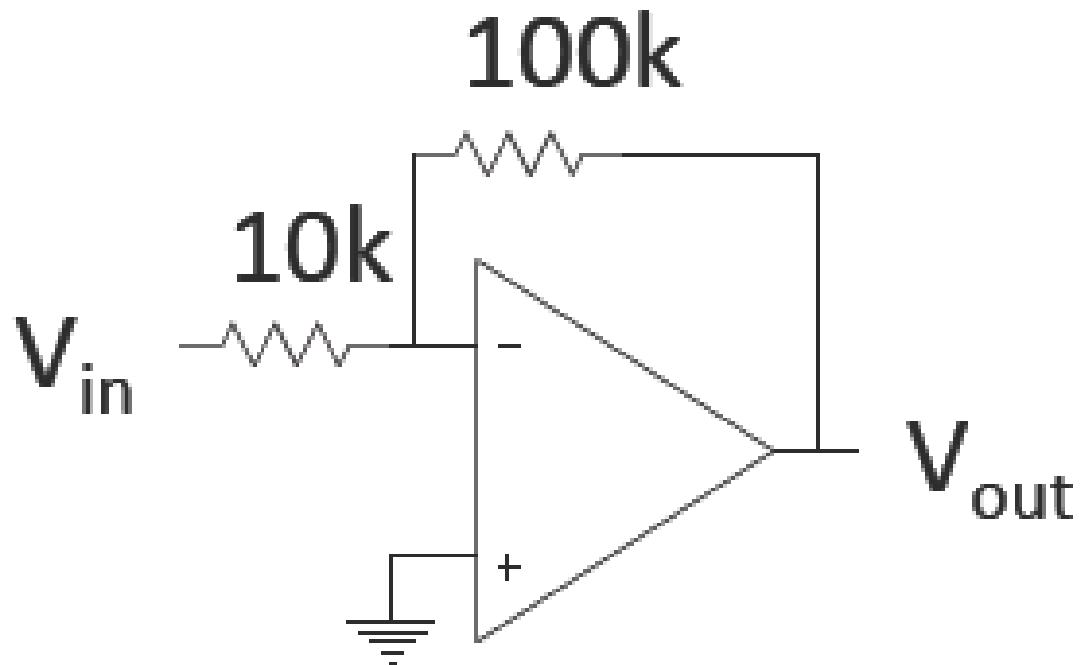
- If  $V_{in} = 1 \text{ V}$  what is  $V_{out}$ ?

- A) 0V
- B) B) 1V
- C) -1V
- D) **15V**
- E) -15V



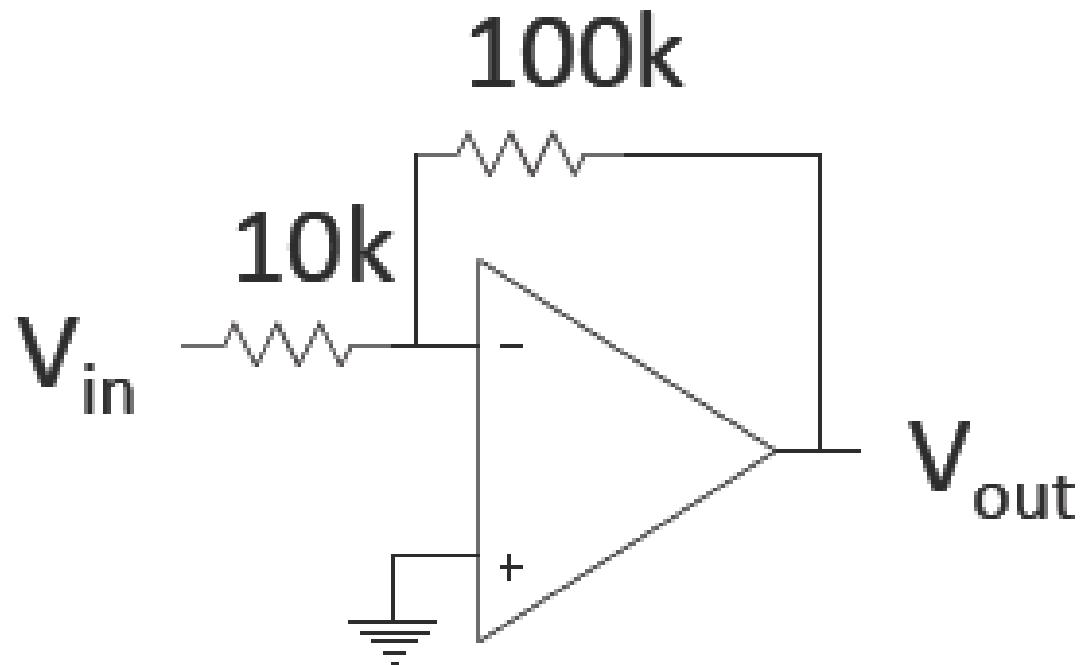
If  $V_{in} = 1V$ , what is  $V_{out}$ ?

- A. 0V
- B. 0.1V
- C. -0.1V
- D. 10V
- E. -10V



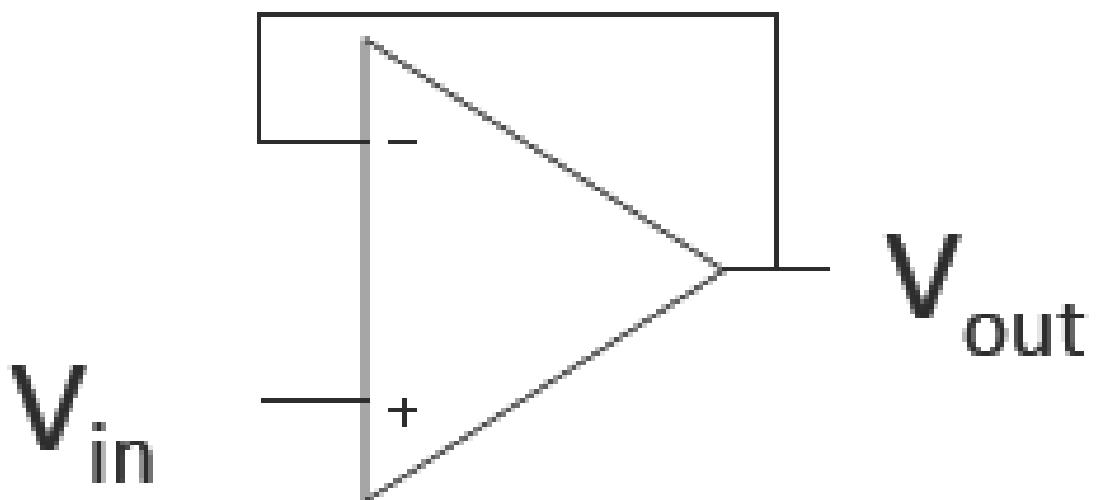
If  $V_{in} = 1V$ , what is  $V_{out}$ ?

- A. 0V
- B. 1V
- C. -1V
- D. 10V**
- E. -10V



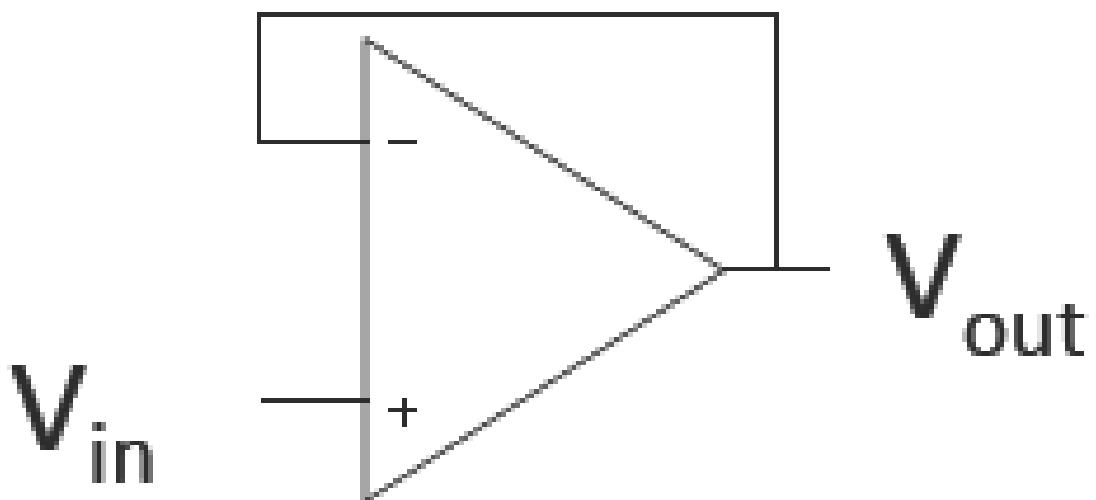
# What is $V_{out}/V_{in}$ ?

- A. 0
- B. 1
- C. -1
- D.  $10^5 \sim \infty$



# What is $V_{out}/V_{in}$ ?

- A. 0
- B. 1**
- C. -1
- D.  $10^5 \sim \infty$



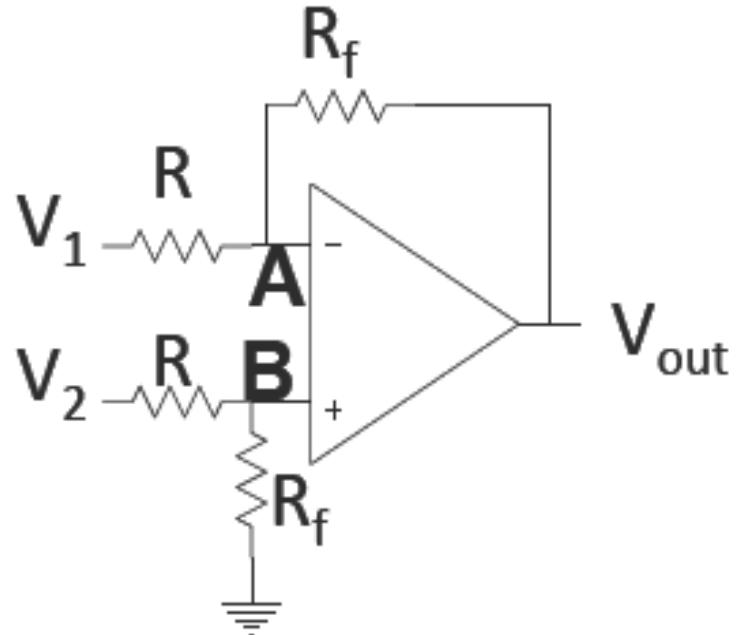
- What is voltage at non-inverting input  $V_B$ ?

A)  $V_B = V_2 \cdot R/R_f$

B)  $V_B = V_2 \cdot R_f/R$

C)  $V_B = V_2 \cdot R/(R_f + R)$

D)  $V_B = V_2 \cdot R_f/(R_f + R)$



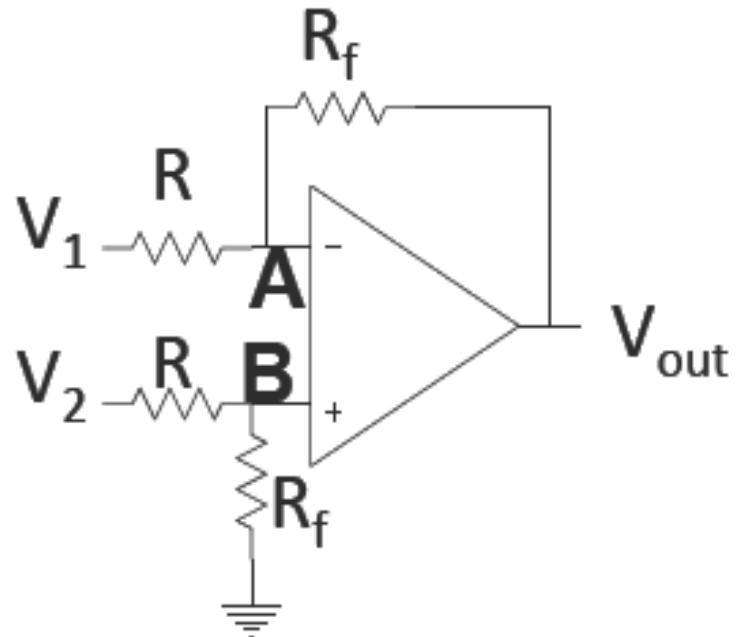
- What is voltage at non-inverting input  $V_B$ ?

A)  $V_B = V_2 \ R/R_f$

B)  $V_B = V_2 \ R_f/R$

C)  $V_B = V_2 \ R/(R_f + R)$

D)  $V_B = V_2 \ R_f/(R_f + R)$



- What is voltage at inverting input  $V_A$ ?

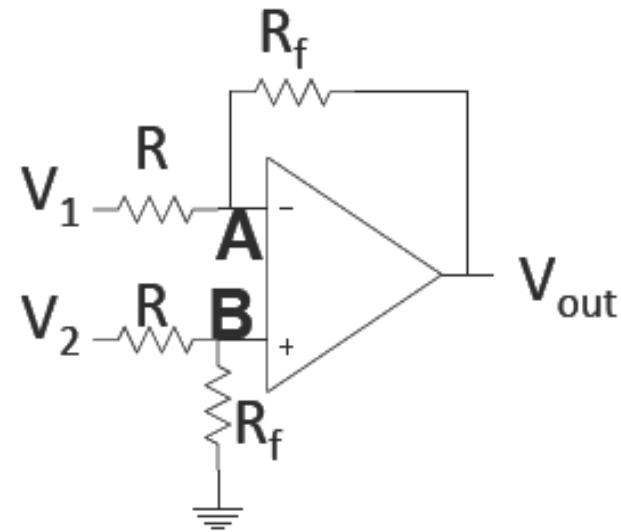
A)  $V_A = (V_1 - V_{out}) R / (R_f + R)$

B)  $V_A = (V_1) R_f / (R_f + R) + V_{out}$

C)  $V_A = (V_1 - V_{out}) R_f / (R_f + R) + V_{out}$

D)  $V_A = (V_1 - V_{out}) R_f / (R_f + R)$

E) 0



- What is voltage at inverting input  $V_A$ ?

A)  $V_A = (V_1 - V_{out}) R / (R_f + R)$

B)  $V_A = (V_1) R_f / (R_f + R) + V_{out}$

C)  $V_A = (V_1 - V_{out}) R_f / (R_f + R) + V_{out}$

D)  $V_A = (V_1 - V_{out}) R_f / (R_f + R)$

E) 0

