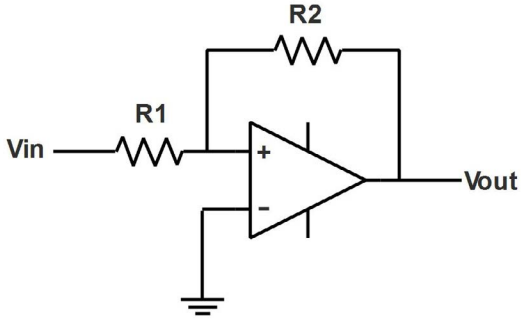
Electronic Design

By ANDY TURUDIC, Technology Editor

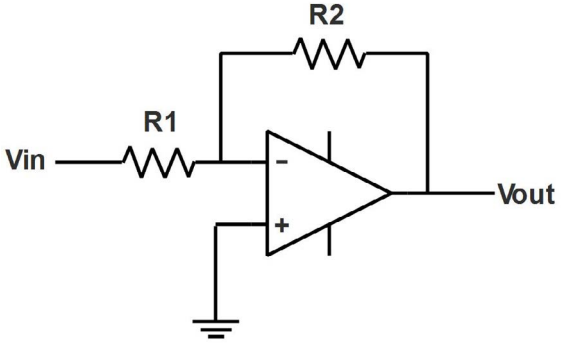
Andy's Analog Quiz 1 - Basic Op Amp Circuits

1. Which is the most common term that describes the function of this op amp circuit?



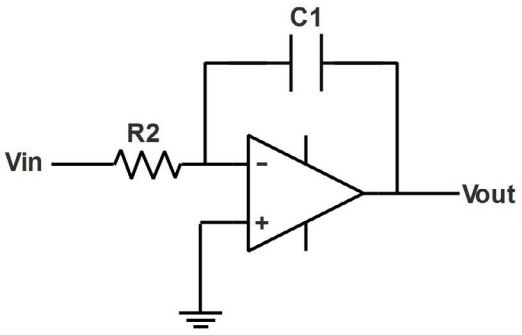
- An amplifier
- An attenuator
- Either an amplifier or attenuator, depending on R1 and R2
- Something else

2. Which is the most common term that describes the function of this op amp circuit?



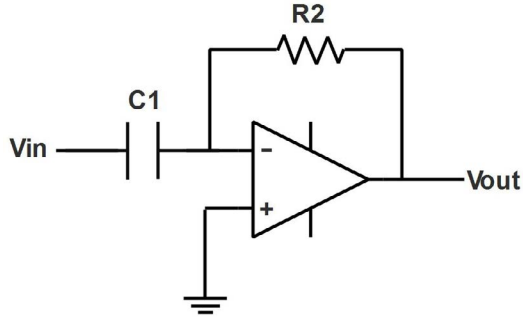
- An amplifier
- An attenuator
- Either an amplifier or attenuator, depending on R1 and R2
- None of the above

3. Which is the most common term that describes the function of this op amp circuit?



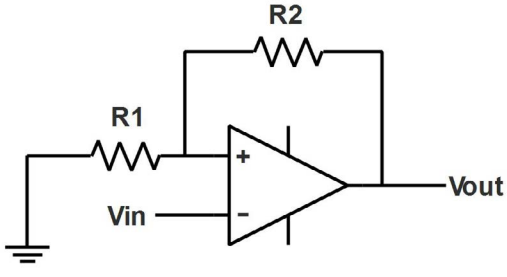
- A low pass filter
- A high pass filter
- An integrator
- A differentiator

4. Which is the most common term that describes the function of this op amp circuit?



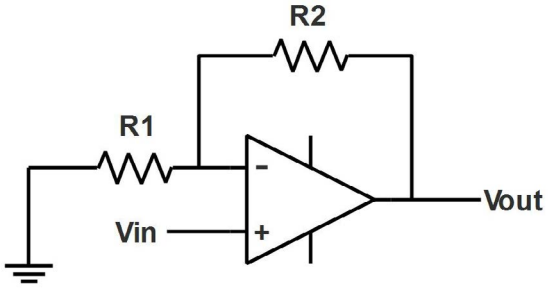
- A low pass filter
- A high pass filter
- An integrator
- A differentiator
- Something else

5. Which is the most common term that describes the function of this op amp circuit?



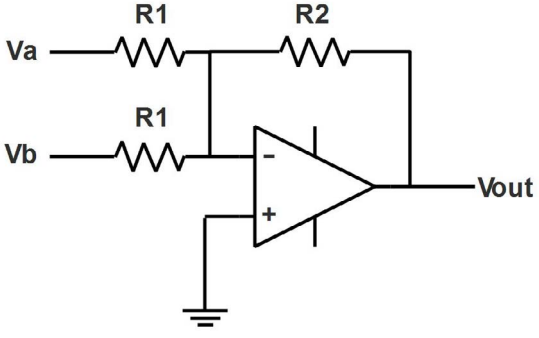
- An amplifier where the gain is R2/R1
- A Schottky clamp where Vout cannot exceed Vout*R2/R1
- An attenuator where the gain is R1/(R1 + R2)
- Schmitt trigger

6. Which is the most common term that describes the function of this op amp circuit if R2 is 0 Ω and R1 is 100 MΩ?



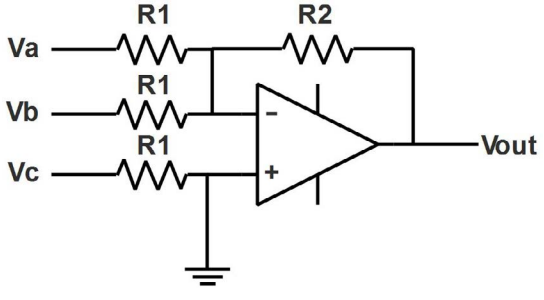
- A short circuit
- A voltage follower
- The circuit is set to zero gain
- Divide-by-zero error
- Schmitt trigger

7. Ignoring gain or attenuation factor, and inverting/noninverting, what operations does this circuit perform?



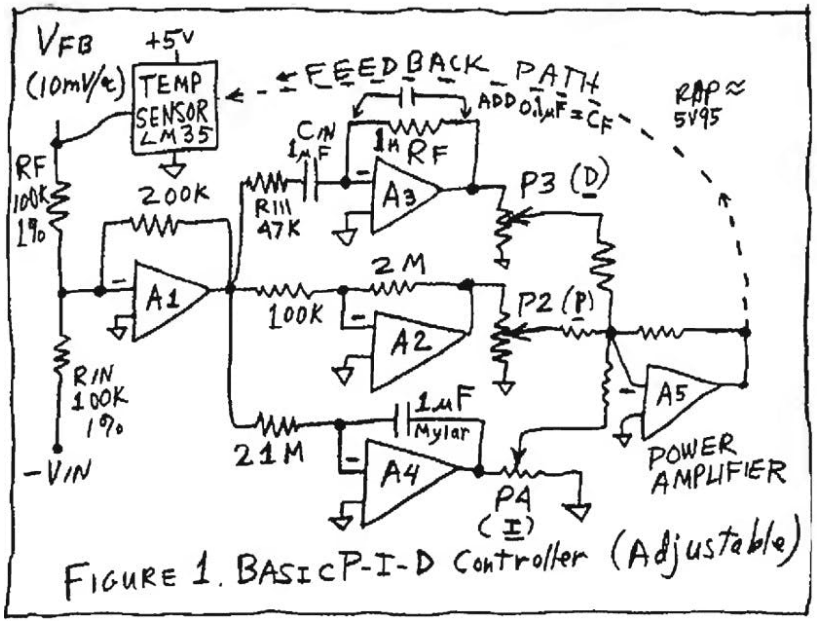
- Va + Vb
- Va -Vb
- Va + Vb - Vout
- Vb - Va

8. Ignoring gain or attenuation factor, and inverting/noninverting, what operations does this circuit perform?



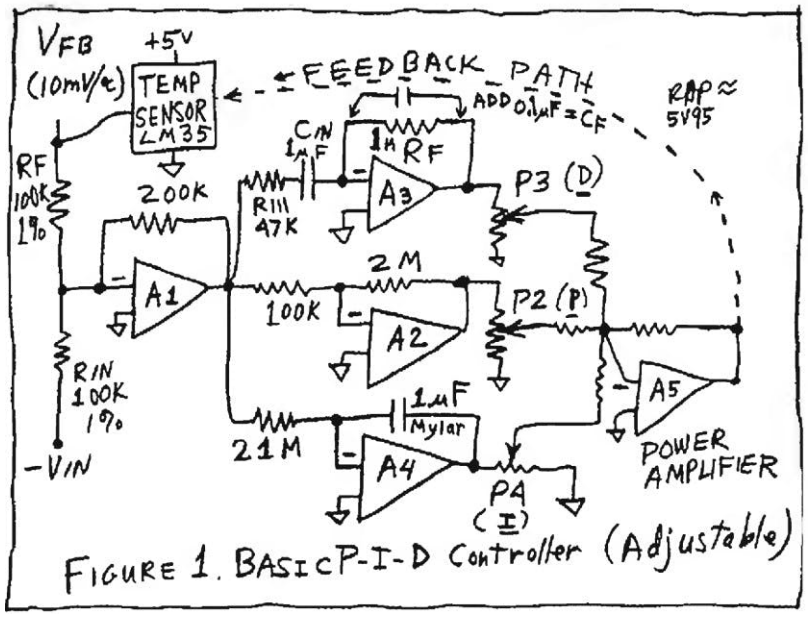
- Va + Vb
- Va + Vb - Vc
- Va + Vb + Vc
- Vc - (Va +Vb) - Vout (R2/R1)

9. Bob Pease wrote a column describing a basic P-I-D controller. In their respective order, A2, A3, and A4 have the following functions:



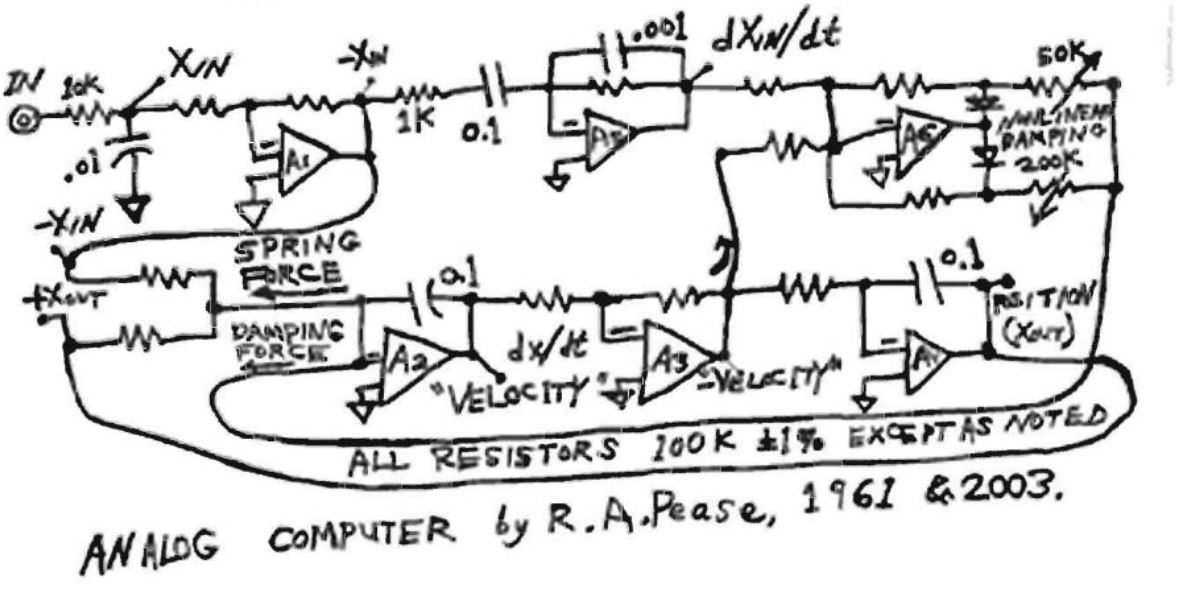
- Amplifier, Differentiator, Integrator
- Amplifier, Integrator, Differentiator
- Proportional, Integrator, Differencing
- Amplifier, Low Pass Filter, High Pass Filter
- Amplifier, High Pass Filter, Low Pass Filter

10. Bob Pease wrote a column describing a basic P-I-D controller. To increase the weight of the integral term to the PID loop (Hint: pick every answer that yields the result):



- Increase the resistance of P4 with respect to ground
- Decrease the resistance of P4 with respect to ground
- Increase the resistance of P3 with respect to ground
- Decrease the resistance of P3 with respect to ground
- Increase the resistance of P3 with respect to ground
- Decrease the resistance of P2 with respect to ground

11. **Back in 1961, Bob Pease came up with an analog computer to simulate an automotive suspension (schematic). Andy Turudic refers to Bob's piece and describes the equations as well as how to implement the simulation on an analog computer. Segment the schematic into op amp functional blocks. Can you spot a polarity inversion stage (negative gain), an integrator, a summer, and a differentiator in Bob's circuit?**



- Yes
- No