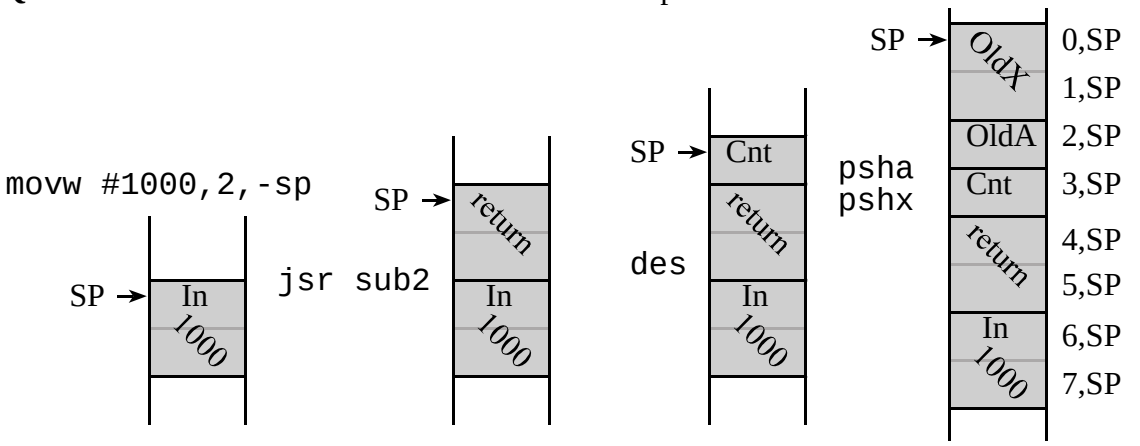
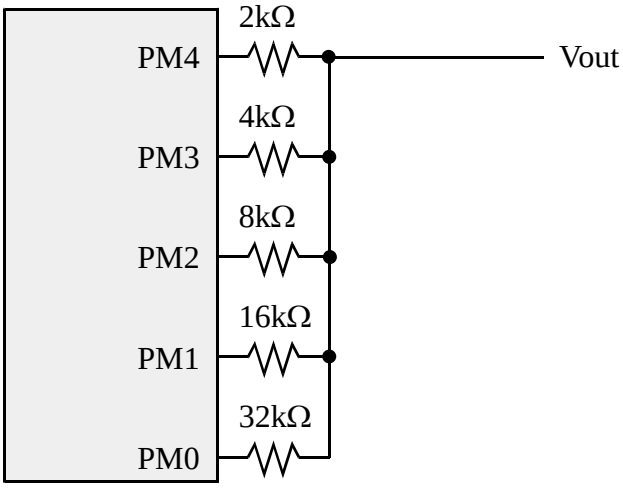
(5) Question 1. A) Finish instruction, push registers, I=1, PC=vector, execute ISR.
(5) Question 2. 2^{12}=4096, 5V/4096, which is about 1.2mV
(5) Question 3. (We can reduce dropout by multiplying before divide by 100)
Start with the goal of the problem: **A = H*W**
Specify the fixed-point definitions: **A = IA/100, W = IW/100, H = IH/100**
Substitute definitions into problem: **IA/100 = IW/100 * IH/100**
Solve algebraic **IA = (IW * IH)/100**
Questions 4 and 5 Hand execute and build a stack picture



(5) Question 4. `in set 6 ; binding of 16-bit input parameter`
(5) Question 5. `cnt set 3 ; binding of 8-bit local variable`
(15) Question 6. Any resistor set that is a power of 2 is OK.



(5) Question 7. C) The software writes to the ATDCTL5 register.
(5) Question 8. `fdb Brake,Go`
(5) Question 9. `ldab 0,y (or ldab 1,y+)`
(5) Question 10. `ldy 1,y (or ldy 0,y)`
(5) Question 11. C) Because the *Fifo* queue decouples execution of producer and consumer.
(5) Question 12. D) All of A, B, and C are correct.

(30) Question 13. A system that increments an 8-bit variable called **Second**, every 1 second.

```
       org  $3800  ; RAM
Second rmb  1      ; increment this every second

       org  $4000      ; EEPROM
main   lds  #$4000     ; initialize stack
       clr  Second     ; initialize shared global
       movb #$80,TSCR1 ; enable TCNT
       movb #$07,TSCR2 ; divide by 128
       bset TIOS,#$80  ; enable OC7
       bset TIE,#$80   ; ARM OC7
       ldd  TCNT
       addd #31250
       std  TC7        ; first one in 1 second
asm cli                ; enable
loop    bra loop  ; main program does nothing

;output compare 7 interrupt service routine, every 1 sec
;4,000,000 E clocks per second
;4,000,000/128 = 31250 TCNTs per second
OC7han
       movb #$80,TFLG1  ;acknowledge
       ldd  TC7
       addd #31250
       std  TC7        ; next interrupt in 1 second
       inc  Second
       rti

       org $FFE0
       fdb OC7han   ; output compare 7 interrupt vector

       org $FFFE
       fdb main   ; reset vector

;4000000/2   = 2000000
;4000000/4   = 1000000
;4000000/8   =  500000
;4000000/16  =  250000
;4000000/32  =  125000
;4000000/64  =   62500
;4000000/128 =   31250
```