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CSE469 HW6

1. a.

mov R0, #4

mov R1, #2

mov R2, #5

bl someFunc

mov R6, R0

someFunc:

add R1, R2

imul R1, R0

sub R1, R2

mov R0, R1

mov PC, LR

b.

mov R0, #4

mov R1, #2

mov R2, #5

bl someFunc

mov R6, R0

someFunc:

sub SP, SP, #4

str R4, SP

add R1, R2

imul R1, R0

sub R1, R2

mov R0, R1

ldr R4, SP

add SP, SP, #4

mov PC, LR

c.

mov R0, #5

mov R1, #0

bl summation

summation:

sub SP, SP, #4

str SP, LR

cmp R0, #1

ble exit

add R1, R0

sub R0, #1

bl summation

exit:

add R1, #1

mov R0, R1

ldr LR, SP

add SP, SP, #4

mov PC, LR

2. a. 00000100.01000000

b. 11011010.01100000

c. 10010110.00110000

3. a. 26.25

sign: 0

absolute value in binary: 11010.01

= 1.101001 \* 2^4

exponent: 4 + 127 = 131 = 10000011

mantissa: 101001

= 0 10000011 10100100000000000000000

b. 1250.3125

sign: 0

absolute value in binary: 10011100010.0101

exponent: 10 + 127 = 137 = 10001001

mantissa: 00111000100101

= 0 10001001 00111000100101000000000

c. -469.0

sign: 1

absolute value in binary: 111010101

exponent: 8 + 127 = 135 = 10000111

mantissa: 11010101

= 1 10000111 11010101000000000000000

4. a. 0 | 10000100 | 11001110000000000000000

exponent: 132 - 127 = 5

mantissa \* exponent \* sign: 1.1100111 \* 2^5 \* 1 = 111001.11

= 57.75

b. 1 | 10000111 | 01101000001000000000000

exponent: 135 - 127 = 8

mantissa \* exponent \* sign: 1.01101000001 \* 2^8 \* -1 = -101101000.001

= -360.125

c. 1 | 01111110 | 00100000000000000000000

exponent: 126 - 127 = -1

mantissa \* exponent \* sign = 1.001 \* 2^-1 \* -1 = -0.1001

= -0.5625