Homework #1

Assume that cost = 10 and price = 12. What is the value of each of the following

expressions?

a. price - cost \* 2

Given: cost = 10, price = 12

Work: 12 - 10 \* 2 = 12 - 20 = -8

Result: -8

b. 15 + price - 3 \* 2

Given: price = 12

Work: 15 + 12 - 3 \* 2 = 15 + 12 - 6 = 21

Result: 21

c. (price + cost) \* 3

Given: cost = 10, price = 12

Work: (12 + 10) \* 3 = 22 \* 3 = 66

Result: 66

d. 4 - 3 \* 2 + cost % price

Given: cost = 10, price = 12

Work: 4 - 3 \* 2 + 10 % 12 = 4 - 6 + 10 = 8

Result: 8

e. cost \* ((price % 3 - 8) + 5) + 100

Given: cost = 10, price = 12

Work: 10 \* ((12 % 3 - 8) + 5) + 100 = 10 \* ((0 - 8) + 5) + 100 = 10 \* (-3 + 5) + 100 = 10 \* 2 + 100 = 20 + 100 = 120

Result: 120

Convert the binary numbers to its equivalent in decimal (base 10), show your work.

Work: 1 \* 2^2 + 1 \* 2^1 + 1 \* 2^0 = 4 + 2 + 1 = 7

Result: 111 (binary) is equivalent to 7 (decimal)

b. Binary 10110 to Decimal:

Work: 1 \* 2^4 + 0 \* 2^3 + 1 \* 2^2 + 1 \* 2^1 + 0 \* 2^0 = 16 + 0 + 4 + 2 + 0 = 22

Result: 10110 (binary) is equivalent to 22 (decimal)

c. Binary 01101100 to Decimal:

Work: 0 \* 2^7 + 1 \* 2^6 + 1 \* 2^5 + 0 \* 2^4 + 1 \* 2^3 + 1 \* 2^2 + 0 \* 2^1 + 0 \* 2^0 = 0 + 64 + 32 + 0 + 8 + 4 + 0 + 0 = 108

Result: 01101100 (binary) is equivalent to 108 (decimal)

Convert decimal numbers to binary:

a. 12 -> 1100

b. 65 -> 1000001

c. 126 -> 1111110

Convert binary numbers to octal:

a. 100010 -> 42

b. 101101111 -> 277

c. 10110 -> 26

Convert binary numbers to hexadecimal:

a. 1000010 -> 42

b. 11101111 -> EF

c. 10110 -> 16

Convert numbers to binary:

a. F81\_H -> 111110000001

b. 702\_8 -> 111000010

c. 101\_10 -> 1100101

Flowchart/Pseudocode

7. Draw a flowchart or write pseudocode to represent the logic of a program that allows the user

to enter a value for the radius of a circle. The program calculates the diameter by multiplying

the radius by 2, and then calculates the circumference by multiplying the diameter by 3.14.

The program outputs both the diameter and the circumference.

Input: radius

diameter = 2 \* radius

circumference = diameter \* 3.14

Output: diameter, circumference

8. Draw a flowchart or write pseudocode to represent the logic of a program that allows the user

to enter three values. The values represent hourly pay rate, the number of hours worked this

pay period, and percentage of gross salary that is withheld. The program multiplies the

hourly pay rate by the number of hours worked, giving the gross pay; then, it multiplies the

gross pay by the withholding percentage, giving the withholding amount. Finally, it subtracts

the withholding amount from the gross pay, giving the net pay after taxes. The program

outputs the net pay.

Input: hourlyPayRate, hoursWorked, withholdingPercentage

grossPay = hourlyPayRate \* hoursWorked

withholdingAmount = grossPay \* (withholdingPercentage / 100)

netPay = grossPay - withholdingAmount

Output: netPay