Practice Set: Operators (12 problems) – v202

<table>
<tr><th>SL</th><th>Problem statement</th><th>Difficulty levels</th></tr>
<tr><td>1.</td><td>Program that will take two numbers X and Y as inputs, then calculate and print the values of their addition, subtraction, multiplication, division (quotient and remainder).

<table>
<tr><th>Sample input (X,Y)</th><th>Sample output</th></tr>
<tr><td>5 10</td><td>Addition: 15
Subtraction: -5
Multiplication: 50
Quotient: 0
Remainder: 5</td></tr>
<tr><td>-5 10.5</td><td>Addition: 5.5
Subtraction: -15.5
Multiplication: -52.5
Quotient: 0
Remainder: -48</td></tr>
</table>
-14 % 3 = -2
-14 % -3 = -2
14 % -3 = 2</td><td>*</td></tr>
<tr><td>2.</td><td>Program that will calculate the circumference of a circle having radius r.
Circumference, C = 2 * Pi * r

<table>
<tr><th>Sample input (r)</th><th>Sample output</th></tr>
<tr><td>5</td><td>Circumference: 31.4</td></tr>
<tr><td>10.5</td><td>Circumference: 65.94</td></tr>
</table></td><td>*</td></tr>
<tr><td>3.</td><td>Program that will take two numbers (a, b) as inputs and compute the value of the equation – (Without using math.h)

$X = (3.31 * a^2 + 2.01 * b^3) / (7.16 * b^2 + 2.01 * a^3)$

<table>
<tr><th>Sample input (a, b)</th><th>Sample output</th></tr>
<tr><td>5 10.5</td><td>X = 2.315475</td></tr>
<tr><td>100 -250</td><td>X = -12.766287</td></tr>
</table></td><td>*</td></tr>
<tr><td>4.</td><td>Program that will increment and decrement a number X by 1 inside the printf function. (Use ++ and - - operators)

<table>
<tr><th>Sample input(X)</th><th>Sample output</th></tr>
<tr><td>5</td><td>X++ : 5
++X : 6
X- - : 5
--X : 4</td></tr>
</table></td><td>**</td></tr>
</table>

	-5	X++ : -5 ++X : -4 X- - : -5 --X : -6	
5.	Program that will increment and decrement a number **X** by **Y**. (Use += and -= operators) **Sample input(X,Y)** / **Sample output** 5 10 / Incremented Value: 10 Decremented Value: -5 -5 5 / Incremented Value: 0 Decremented Value: -10		*
6.	Program that will multiply and divide a number **X** by **Y**. (Use *= and /= operators) **Sample input(X,Y)** / **Sample output** 56 10 / Multiplication: 560 Division: 5 -56 -10 / Multiplication: 560 Division: 5		*

7.	Program that will evaluate the following equations - X = a – b / 3 + c * 2 – 1 Y = a – (b / (3 + c) * 2) - 1 Z = a – ((b / 3) + c * 2) - 1 **Sample input (a, b, c)** / **Sample output** 9 12 3 / X = 10 Y = 4 Z = -1		*
8.	Program that will take **a**, **b** & **c** as inputs and decide if the statements are True (1) of False (0) a) $(a + b) \leq 80$ b) $!(a + c)$ c) $a! = 0$ **Sample input (a, b, c)** / **Sample output** 10 -10 0 / a) 1 b) 0 c) 1		**

9. Program that will take **a**, **b** & **c** as inputs and decide if the statements are True (1) of False (0) ***

1) $(a + b) \leq 80 \;\&\&\; b \geq 0$
2) $(a - b) == 0 \;||c! = 0$
3) $a! = b \;||(b < a)\&\&c > 0$

Sample input (a, b, c)	Sample output
10 -10 0	1) 0 2) 1 3) 1

10. Program that will take calculate the roots of a quadratic equation ($a.x^2 + b.x + c = 0$) from the formula, (here, dot (.) stands for multiplication) - ***

$$\mathbf{root} = \frac{-\mathbf{b} \pm \mathbf{sqrt}(\mathbf{b^2} - 4.\mathbf{a}.\mathbf{c})}{2.\mathbf{a}}$$

Sample input (a, b, c)	Sample output
2 4 -16	2.00 -4.00
1 2 3	Imaginary

11. Program that will evaluate the equation ***

$$2\,\mathbf{cos^2\,x} - \sqrt{3}\,\mathbf{sinx} + \mathbf{sin}\frac{x}{2}$$

; where 1<= x <=180 [No checking needed]

Sample input (x)	Sample output
30	1.810066
120	0.778151
180	3.954243

12. Program to find size of int, float, double and char of the system. **

Sample input	Sample output
	Size of int in byte(s) = 4 Size of float in byte(s) = 4 Size of double in byte(s) = 8 Size of char in byte(s) = 1