Bash Practice Questions for Chapter 5: Using Arithmetic Operators in Bash Scripting

The fifth chapter of the Bash Beginner Series on Linux Handbook focuses on perform arithmetic operations like addition, subtraction, multiplication and division in bash scripts. These practice questions will help you practice what you learned in this chapter.

Exercise 1: Get quotient and remainder

Write a shell script that accepts two integers and prints the quotient and reminder for their division.

Difficulty level: Easy

Hint: Keep things easier by entering bigger number first and smaller number second.

Output: For numbers 13 and 7, quotient is 1 and reminder is 6.

Exercise 2: Multiplication table

Write a shell script that accepts an integer and prints its multiplication table.

Difficulty level: Easy

Hint: Don't use loops at this stage. Simply multiply it by numbers one by one.

Exercise 3: Area and perimeter of a rectangle

Write a shell script that accepts the sides of the rectangle and prints its area and perimeter.

Difficulty level: Intermediate

Hint: Area of a rectangle is the product of length and width. Perimeter is twice the sum of length and width.

Output: Check with length 10 and width 5. Area should be 50 and perimeter is 30.

Exercise 4: Area of a triangle

Write a shell script that takes the base and height as argument and prints its area

Difficulty level: Intermediate

Hint: Area of a triangle is 1/2 * base * height. Use the bc command to get decimal point

Sample outputs: For inputs 10 and 5, area should be 25. For inputs 11 and 3, area should be 16.5

Exercise 5: Area of a triangle with three sides

Write a shell script that takes the three sides of a triangle as argument and prints its area using the Heron's formula.

Difficulty level: Intermediate to hard

Hint: Area of triangle with sides a, b and c is calculated like this using Heron's formula:

```
s=(a+b+c)/2
area=√(s*(s-a)*(s-b)*(s-c))
```

There is a sqrt command in bash to get square root of a number

Sample outputs: For inputs 5,4 and 3, area should be 6. For inputs 10, 4 and 8, area should be 15.19

Solutions to the Exercises

Solution 1: Get quotient and remainder

Write a shell script that accepts two integers and prints the quotient and reminder for their division.

```
#!/bin/bash

read -p "Enter the first number: " dividend
read -p "Enter the second number: " divisor

quotient=$((dividend/divisor))
remainder=$((dividend%divisor))
echo "Quotient: $quotient"
echo "Remainder: $remainder"
```

Solution 2: Multiplication table

Write a shell script that accepts an integer and prints its multiplication table.

```
#!/bin/bash

echo "Multiplication table for $1:"
echo "$1"
echo "$(($1*2))"
echo "$(($1*3))"
echo "$(($1*4))"
echo "$(($1*5))"
echo "$(($1*6))"
echo "$(($1*7))"
echo "$(($1*8))"
echo "$(($1*9))"
echo "$(($1*10))"
```

Solution 3: Area and perimeter of rectangle

Write a shell script that accepts the sides of the rectangle and prints its area and perimeter.

```
#!/bin/bash

read -p "Enter the length of rectangle: " length
read -p "Enter the width of rectangle: " width
area=$(($length * $width))
perimeter=$((2 * $(($length + $width)) ))
echo "Area of the rectangle is $area"
echo "Perimeter of the rectangle is $perimeter"
```

Solution 4: Area of a triangle

Write a shell script that takes the base and height as argument and prints its area

```
#!/bin/bash

read -p "Enter the base of triangle: " base
read -p "Enter the height of triangle: " height

# scale 2 means the calculation will be up to 2 decimal places
area=$(echo "scale=2; (1/2) * $base * $height" | bc -l)
echo "Area of the triangle is $area"
```

Solution 5: Area of a triangle with three sides

Write a shell script that takes the three sides of a triangle as argument and prints its area using the Heron's formula.

```
#!/bin/bash

read -p "Enter the first side: " a
read -p "Enter the second side: " b
read -p "Enter the third side: " c

s=$(echo "scale=2; ($a+$b+$c)/2" | bc)
area=$(echo "scale=2; sqrt($s*($s-$a)*($s-$b)*($s-$c))" | bc)
echo "The area of the triangle is $area"
```