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Grade 6 Math Circles March 21/22/23, 2023 Control Flow - Problem Set

- 1. What is the difference between an if statement and a switch case statement?
- 2. What is the difference between a for loop and a while loop?
- 3. Circle whether or not the following pieces of code will stop looping (terminate). Give a brief explanation as to why or why not.
 - (a) Terminates / Does not terminate

```
1 for(i=0; i<5; i++) {
2     print(i)
3 }</pre>
```

(b) Terminates / Does not terminate

```
1 for(i=0; i<5; i--) {
2     print(i)
3 }</pre>
```

(c) Terminates / Does not terminate

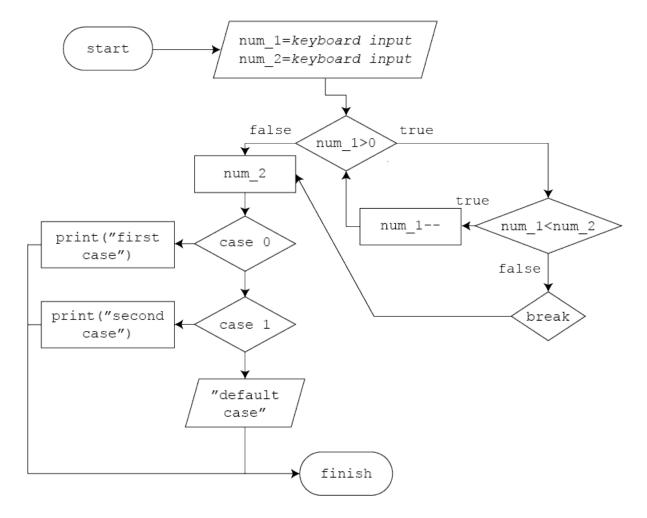
```
1 i=1
2 while(not i=0) {
3     i=i/2
4 }
```

4. Based on the code, draw a control flow diagram. Note that $x^2 = x \times x$.

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```
1 x=3
2 y=4
3 z=0
4
5 while(not x^2+y^2=z^2) {
6
      Z++
7 }
8
9 \text{ sum}=x+y+z
10
11 while(true) {
12
   sum=sum/2-1
13 if(sum<0) {
14
         break
   } else {
15
16
          sum++
17 }
18 }
```





5. Based on the following diagram, write pseudo-code that would match this diagram.



- x=0 start i=0 false i<5 А true false x++ x>8 i<3 i++ true x++ true x=x^2-5x-3 false x=x^2-5x+3 В х case 21 case 27 X++ x=x+2 х--С finish
- 6. Based on the following diagram, track the value of x at the given points (A, B, and C).