• Depending on condn., new_left = $\frac{left+right}{2}+1$ or,

new_right = $\frac{left+right}{2}-1$.

• Now, new_left > old_right iff $\frac{left+right}{2}$ = right, or left = right

• Similarly, new_right < old_left iff left = right.

∴ We already know searchnum ∉ list[0.....left-1] and ∉ list[left+1.....n-1]

∴ Since, we have moved to the next iteration, it means searchnum ≠ list[left]

So, searchnum ∉ list[0.....n-1], and the loop terminates and returns -1, as it should. □

Exercises - 1.3

1.) a) Is n=2 the largest value of n for which there exist +ve integers x, y and Z such that $x^n+y^n=z^n$ has a solution?

b) Store 5 divided by 0 into x and go to statement 10.

Both fail to satisfy one of the five criteria of an algorithm. Which criterion do they violate

Soln: b) What is Statement 10? Not specified. Ambiguous instruction.

a) Violates finiteness (since we don't know how many triples of x,y,Z we need to check effectively) and it also violates effectiveness; the instructions can't be computed manually.

2) Horner's rule is a strategy for evaluating a polynomial $A(x) = a_n x^n + a_{n-1}x^{n-1} + \dots + a_1 x + a_0$ at point x_0 using a minimum no. of multiplications. This rule is: $A(x_0) = (\dots((a_n x_0 + a_{n-1})x_0 + \dots + a_1)x_0 + a_0)$

Write a C program to evaluate a polynomial using Horner's rule.

$2x^2+3x+12 = (2x+3)x+12$