

1. Computer Number System

Convert decimal to hex.

5

9

20

23

2019

2020

2. Computer Number System

Convert decimal to octal. Write the octal digits in ascending order. Convert this new octal to hex.

2019

2020

3. Computer Number System

Convert hex to oct

$100_{16}$

$508_{16}$

$89B_{16}$

$354C_{16}$

$1060_{16}$

$195_{16}$

$88F_{16}$

4. Computer Number System

Convert to bin then count 1's number

$4879_{16}$

$BCDEF_{16}$

$82712_{10}$

$654_{10}$

$357_8$

$88A_{16}$

5. Recursive Function

Find  $f(f(f(50)))$  where  $[a/b] =$  greatest integer function  
and  $|a| =$  absolute value function

$$f(x) = \begin{cases} f\left(\left\lceil \frac{x}{3} \right\rceil\right) + 2 & \text{if } x > 20 \\ f(|10 - x|) - 3 & \text{if } 8 \leq x \leq 20 \\ x^2 - x + 1 & \text{if } x < 8 \end{cases}$$

6. Recursive Function

If  $f(1) = 8$  and

$$f(n+1) = 2 * f(n) - 4,$$

find  $f(5)$ .

7. Recursive Function

Given:  $f(1) = 3$

$$f(2) = 5$$

$$f(n) = 4 * f(n - 1) - f(n - 2)$$

Find the smallest value of  $n$  such that  $f(n) > 300$ .

8. Recursive Function

Find  $f(f(f(16)))$  given:

$$f(x) = \begin{cases} f(x - 4) + 2 & \text{if } x \geq 10 \\ f(x + 1) - 1 & \text{if } 6 < x < 10 \\ x + 3 & \text{if } x \leq 6 \end{cases}$$

9. What does this program do?

```
a = 100 : b = a / 5 : c = a / b
d = a / (b + c) : e = b / c
if a == b * c then
f = 2
end if
if d / 3 == int(d / 3) then
d = d / 3
else
d = d + 1
end if
if d * e - b < e then
a = a / f
else
a = a / (b + c)
end if
if (a > b) || (c < d) then
a = a - d * e
end if
if (a == c * d) && (b - d == e * a) then
b = b - e * f
else
b = b / d / e
end if
g = f ↑ c / e - e * f + b ↑ (a + 2 * d) * c * e / (d * e)
output g
end
```

10. What does this program do?

```
a = 10 : b = 2 : c = 40
d = a / b
e = 6 * a + c
f = b * c / d
if d < e then
d = d + d
else
e = e + e
end if
if a * d > e then
a = a * d
else
e = e - a * d
end if
if c ↑ e == b ↑ e then
c = c / 2
else
b = b * b
end if
if (f < c) && (a > b) then
f = f / 4
else
a = a / b
end if
if 2 * d - 3 * b == c + a then
d = b + c
end if
f = f / 2
g = a * b + c + d + e + f * a
h = g / (c - a) + b * (c ↑ e + f) / 3 - b ↑ a / f ↑ 5 / b
output h
end
```