ZeroJudge b537. 分數運算-1

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113/10/31

題目

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- f(1)=1

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- f(1)=1
- f(k)=1+f(k/2), k is even

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- f(1)=1
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- f(k)=1/f(k-1), k is odd

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f(k)=a/b

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e.g.

f(6) = 1 + f(3)

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f(6) = 1 + f(3)

f(8) = 1 + f(4)

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f(6) = 1 + f(3)　　f(9) = 1 / f(8)

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f(6) = 1 + f(3)　　f(9) = 1 / f(8)

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f(k)=a/b $\Longrightarrow$ k=?

範例輸入
1 1
2 1
1 2
3 1
1 3
3 2
2 3
4 1
1 4
4 3
30 11

e.g.

f(6) = 1 + f(3)　　f(9) = 1 / f(8)

f(8) = 1 + f(4)　　f(11) = 1 / f(10)

題目

- f(1)=1
- f(k)=1+f(k/2), k is even
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f(k)=a/b $\Longrightarrow$ k=?

範例輸入	範例輸出
1 1	1
2 1	2
1 2	3
3 1	4
1 3	5
3 2	6
2 3	7
4 1	8
1 4	9
4 3	10
30 11	236

e.g.

f(6) = 1 + f(3)　　f(9) = 1 / f(8)

f(8) = 1 + f(4)　　f(11) = 1 / f(10)

從範例測資開始分析

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$$\frac{30}{11}$$

從範例測資開始分析

$$\frac{30}{11} = 1 + \frac{19}{11}$$

從範例測資開始分析

$$\frac{30}{11} = 1 + \underbrace{\frac{19}{11}}_{f(k)}$$

從範例測資開始分析

$$\underbrace{\frac{30}{11}}_{f(2k)} = 1 + \underbrace{\frac{19}{11}}_{f(k)}$$

從範例測資開始分析

$$\frac{30}{11} = 1 + \frac{19}{11} = 1 + 1 + \frac{8}{11}$$

從範例測資開始分析

$$\frac{30}{11} = 1 + \frac{19}{11} = 1 + 1 + \underbrace{\frac{8}{11}}_{f(k)}$$

從範例測資開始分析

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從範例測資開始分析

$$\frac{30}{11} = 1 + \frac{19}{11} = 1 + 1 + \frac{8}{11}$$

f(4k)　　f(2k)　　f(k)

從範例測資開始分析

$$\frac{30}{11} = 1 + \frac{19}{11} = 1 + 1 + \frac{8}{11} \qquad \frac{8}{11}$$

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從範例測資開始分析

$$\frac{30}{11} = 1 + \frac{19}{11} = 1 + 1 + \frac{8}{11}$$

f(4k)　f(2k)　f(k)

$$\frac{8}{11} = \frac{1}{\frac{11}{8}}$$

從範例測資開始分析

$$\underset{f(4k)}{\frac{30}{11}} = 1 + \underset{f(2k)}{\frac{19}{11}} = 1 + 1 + \underset{f(k)}{\frac{8}{11}}$$

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$$\underset{f(4k)}{\frac{30}{11}} = 1 + \underset{f(2k)}{\frac{19}{11}} = 1 + 1 + \underset{f(k)}{\frac{8}{11}}$$

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$$\frac{11}{8}$$

從範例測資開始分析

$$\frac{30}{11} = 1 + \frac{19}{11} = 1 + 1 + \frac{8}{11}$$

f(4k) f(2k) f(k)

$$\frac{8}{11} = \frac{1}{\frac{11}{8}}$$

f(k+1) f(k)

$$\frac{11}{8} = 1 + \frac{3}{8}$$

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f(k+1) f(k)

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f(k+1) f(k)

$$\frac{8}{3} = 1 + \frac{5}{3} = 1 + 1 + \frac{2}{3}$$

f(4k) f(2k) f(k)

$$\frac{2}{3}$$

從範例測資開始分析

$$\frac{30}{11} = 1 + \frac{19}{11} = 1 + 1 + \frac{8}{11}$$

f(4k) f(2k) f(k)

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f(k+1) f(k)

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f(2k) f(k)

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f(2k) f(k)

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從範例測資開始分析

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f(2k) f(k)

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f(k+1) f(k)

$$\frac{8}{3} = 1 + \frac{5}{3} = 1 + 1 + \frac{2}{3}$$

f(4k) f(2k) f(k)

$$\frac{2}{3} = \frac{1}{\frac{3}{2}}$$

f(k+1) f(k)

$$\frac{3}{2} = 1 + \frac{1}{2}$$

f(2k) f(k)

$$\frac{1}{2}$$

從範例測資開始分析

$$\frac{30}{11} = 1 + \frac{19}{11} = 1 + 1 + \frac{8}{11}$$

f(4k) f(2k) f(k)

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f(4k) f(2k) f(k)

$$\frac{2}{3} = \frac{1}{\frac{3}{2}}$$

f(k+1) f(k)

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f(2k) f(k)

$$\frac{1}{2} = \frac{1}{\frac{2}{1}}$$

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$$\frac{30}{11} = 1 + \frac{19}{11} = 1 + 1 + \frac{8}{11}$$

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f(2k) f(k)

$$\frac{3}{8} = \frac{1}{\frac{8}{3}}$$

f(k+1) f(k)

$$\frac{8}{3} = 1 + \frac{5}{3} = 1 + 1 + \frac{2}{3}$$

f(4k) f(2k) f(k)

$$\frac{2}{3} = \frac{1}{\frac{3}{2}}$$

f(k+1) f(k)

$$\frac{3}{2} = 1 + \frac{1}{2}$$

f(2k) f(k)

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f(k+1) f(k)

$$\frac{2}{1}$$

從範例測資開始分析

$$\frac{30}{11} = 1 + \frac{19}{11} = 1 + 1 + \frac{8}{11}$$

f(4k) f(2k) f(k)

$$\frac{8}{11} = \frac{1}{\frac{11}{8}}$$

f(k+1) f(k)

$$\frac{11}{8} = 1 + \frac{3}{8}$$

f(2k) f(k)

$$\frac{3}{8} = \frac{1}{\frac{8}{3}}$$

f(k+1) f(k)

$$\frac{8}{3} = 1 + \frac{5}{3} = 1 + 1 + \frac{2}{3}$$

f(4k) f(2k) f(k)

$$\frac{2}{3} = \frac{1}{\frac{3}{2}}$$

f(k+1) f(k)

$$\frac{3}{2} = 1 + \frac{1}{2}$$

f(2k) f(k)

$$\frac{1}{2} = \frac{1}{\frac{2}{1}}$$

f(k+1) f(k)

$$\frac{2}{1} = 1 + 1$$

從範例測資開始分析

$$\underset{f(4k)}{\frac{30}{11}} = 1 + \underset{f(2k)}{\frac{19}{11}} = 1 + 1 + \underset{f(k)}{\frac{8}{11}}$$

$$\underset{f(k+1)}{\frac{8}{11}} = \frac{1}{\underset{f(k)}{\frac{11}{8}}}$$

$$\underset{f(2k)}{\frac{11}{8}} = 1 + \underset{f(k)}{\frac{3}{8}}$$

$$\underset{f(k+1)}{\frac{3}{8}} = \frac{1}{\underset{f(k)}{\frac{8}{3}}}$$

$$\underset{f(4k)}{\frac{8}{3}} = 1 + \underset{f(2k)}{\frac{5}{3}} = 1 + 1 + \underset{f(k)}{\frac{2}{3}}$$

$$\underset{f(k+1)}{\frac{2}{3}} = \frac{1}{\underset{f(k)}{\frac{3}{2}}}$$

$$\underset{f(2k)}{\frac{3}{2}} = 1 + \underset{f(k)}{\frac{1}{2}}$$

$$\underset{f(k+1)}{\frac{1}{2}} = \frac{1}{\underset{f(k)}{\frac{2}{1}}}$$

$$\underset{f(1)}{\frac{2}{1}} = 1 + 1$$

從範例測資開始分析

$$\frac{30}{11} = 1 + \frac{19}{11} = 1 + 1 + \frac{8}{11}$$

f(4k) f(2k) f(k)

$$\frac{8}{11} = \frac{1}{\frac{11}{8}}$$

f(k+1) f(k)

$$\frac{11}{8} = 1 + \frac{3}{8}$$

f(2k) f(k)

$$\frac{3}{8} = \frac{1}{\frac{8}{3}}$$

f(k+1) f(k)

$$\frac{8}{3} = 1 + \frac{5}{3} = 1 + 1 + \frac{2}{3}$$

f(4k) f(2k) f(k)

$$\frac{2}{3} = \frac{1}{\frac{3}{2}}$$

f(k+1) f(k)

$$\frac{3}{2} = 1 + \frac{1}{2}$$

f(2k) f(k)

$$\frac{1}{2} = \frac{1}{\frac{2}{1}}$$

f(k+1) f(k)

$$\frac{2}{1} = 1 + 1$$

f(2) f(1)

從範例測資開始分析

$$\frac{30}{11} = 1 + \frac{19}{11} = 1 + 1 + \frac{8}{11}$$

f(4k) f(2k) f(k)

$$\frac{8}{11} = \frac{1}{\frac{11}{8}}$$

f(k+1) f(k)

$$\frac{11}{8} = 1 + \frac{3}{8}$$

f(2k) f(k)

$$\frac{3}{8} = \frac{1}{\frac{8}{3}}$$

f(k+1) f(k)

$$\frac{8}{3} = 1 + \frac{5}{3} = 1 + 1 + \frac{2}{3}$$

f(4k) f(2k) f(k)

$$\frac{2}{3} = \frac{1}{\frac{3}{2}}$$

f(k+1) f(k)

$$\frac{3}{2} = 1 + \frac{1}{2}$$

f(2k) f(k)

$$\frac{1}{2} = \frac{1}{\frac{2}{1}}$$

f(k+1) f(k)

$$\frac{2}{1} = 1 + 1$$

f(1)

f(2)

2

從範例測資開始分析

$$\frac{30}{11} = 1 + \frac{19}{11} = 1 + 1 + \frac{8}{11}$$

f(4k) f(2k) f(k)

$$\frac{8}{11} = \frac{1}{\frac{11}{8}}$$

f(k+1) f(k)

$$\frac{11}{8} = 1 + \frac{3}{8}$$

f(2k) f(k)

$$\frac{3}{8} = \frac{1}{\frac{8}{3}}$$

f(k+1) f(k)

$$\frac{8}{3} = 1 + \frac{5}{3} = 1 + 1 + \frac{2}{3}$$

f(4k) f(2k) f(k)

$$\frac{2}{3} = \frac{1}{\frac{3}{2}}$$

f(k+1) f(k)

$$\frac{3}{2} = 1 + \frac{1}{2}$$

f(2k) f(k)

$$\frac{1}{2} = \frac{1}{\frac{2}{1}}$$

f(k+1) f(k)

3 2

$$\frac{2}{1} = 1 + 1$$

f(2) f(1)

從範例測資開始分析

$$\frac{30}{11} = 1 + \frac{19}{11} = 1 + 1 + \frac{8}{11}$$

f(4k) f(2k) f(k)

$$\frac{8}{11} = \frac{1}{\frac{11}{8}}$$

f(k+1) f(k)

$$\frac{11}{8} = 1 + \frac{3}{8}$$

f(2k) f(k)

$$\frac{3}{8} = \frac{1}{\frac{8}{3}}$$

f(k+1) f(k)

$$\frac{8}{3} = 1 + \frac{5}{3} = 1 + 1 + \frac{2}{3}$$

f(4k) f(2k) f(k)

$$\frac{2}{3} = \frac{1}{\frac{3}{2}}$$

f(k+1) f(k)

$$\frac{3}{2} = 1 + \frac{1}{2}$$

f(2k) f(k)

3

$$\frac{1}{2} = \frac{1}{\frac{2}{1}}$$

f(k+1) f(k)

3 2

$$\frac{2}{1} = 1 + 1$$

f(2) f(1)

從範例測資開始分析

$$\frac{30}{11} = 1 + \frac{19}{11} = 1 + 1 + \frac{8}{11}$$

f(4k) f(2k) f(k)

$$\frac{8}{11} = \frac{1}{\frac{11}{8}}$$

f(k+1) f(k)

$$\frac{11}{8} = 1 + \frac{3}{8}$$

f(2k) f(k)

$$\frac{3}{8} = \frac{1}{\frac{8}{3}}$$

f(k+1) f(k)

$$\frac{8}{3} = 1 + \frac{5}{3} = 1 + 1 + \frac{2}{3}$$

f(4k) f(2k) f(k)

$$\frac{2}{3} = \frac{1}{\frac{3}{2}}$$

f(k+1) f(k)

$$\frac{3}{2} = 1 + \frac{1}{2}$$

f(2k) f(k)

6 3

$$\frac{1}{2} = \frac{1}{\frac{2}{1}}$$

f(k+1) f(k)

3 2

$$\frac{2}{1} = 1 + 1$$

f(2) f(1)

從範例測資開始分析

$\frac{30}{11} = 1 + \frac{19}{11} = 1 + 1 + \frac{8}{11}$

f(4k) f(2k) f(k)

$\frac{8}{11} = \frac{1}{\frac{11}{8}}$ f(k)

f(k+1)

$\frac{11}{8} = 1 + \frac{3}{8}$

f(2k) f(k)

$\frac{3}{8} = \frac{1}{\frac{8}{3}}$ f(k)

f(k+1)

$\frac{8}{3} = 1 + \frac{5}{3} = 1 + 1 + \frac{2}{3}$

f(4k) f(2k) f(k)

$\frac{2}{3} = \frac{1}{\frac{3}{2}}$ f(k)

f(k+1)

6

$\frac{3}{2} = 1 + \frac{1}{2}$

f(2k) f(k)

6 3

$\frac{1}{2} = \frac{1}{\frac{2}{1}}$ f(k)

f(k+1)

3 2

$\frac{2}{1} = 1 + 1$

f(1)

f(2)

從範例測資開始分析

$$\frac{30}{11} = 1 + \frac{19}{11} = 1 + 1 + \frac{8}{11}$$

f(4k) f(2k) f(k)

$$\frac{8}{11} = \frac{1}{\frac{11}{8}}$$

f(k+1) f(k)

$$\frac{11}{8} = 1 + \frac{3}{8}$$

f(2k) f(k)

$$\frac{3}{8} = \frac{1}{\frac{8}{3}}$$

f(k+1) f(k)

$$\frac{8}{3} = 1 + \frac{5}{3} = 1 + 1 + \frac{2}{3}$$

f(4k) f(2k) f(k)

$$\frac{2}{3} = \frac{1}{\frac{3}{2}}$$

f(k+1) f(k)

7 6

$$\frac{3}{2} = 1 + \frac{1}{2}$$

f(2k) f(k)

6 3

$$\frac{1}{2} = \frac{1}{\frac{2}{1}}$$

f(k+1) f(k)

3 2

$$\frac{2}{1} = 1 + 1$$

f(2) f(1)

從範例測資開始分析

$\frac{30}{11} = 1 + \frac{19}{11} = 1 + 1 + \frac{8}{11}$

f(4k) f(2k) f(k)

$\frac{8}{11} = \frac{1}{\frac{11}{8}}$ f(k)

f(k+1)

$\frac{11}{8} = 1 + \frac{3}{8}$

f(2k) f(k)

$\frac{3}{8} = \frac{1}{\frac{8}{3}}$ f(k)

f(k+1)

$\frac{8}{3} = 1 + \frac{5}{3} = 1 + 1 + \frac{2}{3}$

f(4k) f(2k) f(k)

7

$\frac{2}{3} = \frac{1}{\frac{3}{2}}$ f(k)

f(k+1)

7

6

$\frac{3}{2} = 1 + \frac{1}{2}$

f(2k) f(k)

6 3

$\frac{1}{2} = \frac{1}{\frac{2}{1}}$ f(k)

f(k+1)

3

2

$\frac{2}{1} = 1 + 1$

f(1)

f(2)

從範例測資開始分析

$$\frac{30}{11} = 1 + \frac{19}{11} = 1 + 1 + \frac{8}{11}$$

f(4k) f(2k) f(k)

$$\frac{8}{11} = \frac{1}{\frac{11}{8}}$$

f(k+1) f(k)

$$\frac{11}{8} = 1 + \frac{3}{8}$$

f(2k) f(k)

$$\frac{3}{8} = \frac{1}{\frac{8}{3}}$$

f(k+1) f(k)

$$\frac{8}{3} = 1 + \frac{5}{3} = 1 + 1 + \frac{2}{3}$$

f(4k) f(2k) f(k)

14 7

$$\frac{2}{3} = \frac{1}{\frac{3}{2}}$$

f(k+1) f(k)

7 6

$$\frac{3}{2} = 1 + \frac{1}{2}$$

f(2k) f(k)

6 3

$$\frac{1}{2} = \frac{1}{\frac{2}{1}}$$

f(k+1) f(k)

3 2

$$\frac{2}{1} = 1 + 1$$

f(2) f(1)

從範例測資開始分析

$$\frac{30}{11} = 1 + \frac{19}{11} = 1 + 1 + \frac{8}{11}$$

f(4k) f(2k) f(k)

$$\frac{8}{11} = \frac{1}{\frac{11}{8}}$$

f(k+1) f(k)

$$\frac{11}{8} = 1 + \frac{3}{8}$$

f(2k) f(k)

$$\frac{3}{8} = \frac{1}{\frac{8}{3}}$$

f(k+1) f(k)

$$\frac{8}{3} = 1 + \frac{5}{3} = 1 + 1 + \frac{2}{3}$$

f(4k) f(2k) f(k)

28 14 7

$$\frac{2}{3} = \frac{1}{\frac{3}{2}}$$

f(k+1) f(k)

7 6

$$\frac{3}{2} = 1 + \frac{1}{2}$$

f(2k) f(k)

6 3

$$\frac{1}{2} = \frac{1}{\frac{2}{1}}$$

f(k+1) f(k)

3 2

$$\frac{2}{1} = 1 + 1$$

f(2) f(1)

從範例測資開始分析

$$\frac{30}{11} = 1 + \frac{19}{11} = 1 + 1 + \frac{8}{11}$$

f(4k) f(2k) f(k)

$$\frac{8}{11} = \frac{1}{\frac{11}{8}}$$

f(k+1) f(k)

$$\frac{11}{8} = 1 + \frac{3}{8}$$

f(2k) f(k)

$$\frac{3}{8} = \frac{1}{\frac{8}{3}}$$

f(k+1) f(k)

28

$$\frac{8}{3} = 1 + \frac{5}{3} = 1 + 1 + \frac{2}{3}$$

f(4k) f(2k) f(k)

28 14 7

$$\frac{2}{3} = \frac{1}{\frac{3}{2}}$$

f(k+1) f(k)

7 6

$$\frac{3}{2} = 1 + \frac{1}{2}$$

f(2k) f(k)

6 3

$$\frac{1}{2} = \frac{1}{\frac{2}{1}}$$

f(k+1) f(k)

3 2

$$\frac{2}{1} = 1 + 1$$

f(2) f(1)

從範例測資開始分析

$\frac{30}{11} = 1 + \frac{19}{11} = 1 + 1 + \frac{8}{11}$

f(4k) f(2k) f(k)

$\frac{8}{11} = \frac{1}{\frac{11}{8}}$ f(k)

f(k+1)

$\frac{11}{8} = 1 + \frac{3}{8}$

f(2k) f(k)

$\frac{3}{8} = \frac{1}{\frac{8}{3}}$ f(k)

f(k+1)

29 28

$\frac{8}{3} = 1 + \frac{5}{3} = 1 + 1 + \frac{2}{3}$

f(4k) f(2k) f(k)

28 14 7

$\frac{2}{3} = \frac{1}{\frac{3}{2}}$ f(k)

f(k+1)

7 6

$\frac{3}{2} = 1 + \frac{1}{2}$

f(2k) f(k)

6 3

$\frac{1}{2} = \frac{1}{\frac{2}{1}}$ f(k)

f(k+1)

3 2

$\frac{2}{1} = 1 + 1$

f(1)

f(2)

從範例測資開始分析

$\frac{30}{11} = 1 + \frac{19}{11} = 1 + 1 + \frac{8}{11}$

f(4k) f(2k) f(k)

$\frac{8}{11} = \frac{1}{\frac{11}{8}}$ f(k)

f(k+1)

$\frac{11}{8} = 1 + \frac{3}{8}$

f(2k) f(k)

29

$\frac{3}{8} = \frac{1}{\frac{8}{3}}$ f(k)

f(k+1)

29 28

$\frac{8}{3} = 1 + \frac{5}{3} = 1 + 1 + \frac{2}{3}$

f(4k) f(2k) f(k)

28 14 7

$\frac{2}{3} = \frac{1}{\frac{3}{2}}$ f(k)

f(k+1)

7 6

$\frac{3}{2} = 1 + \frac{1}{2}$

f(2k) f(k)

6 3

$\frac{1}{2} = \frac{1}{\frac{2}{1}}$ f(k)

f(k+1)

3 2

$\frac{2}{1} = 1 + 1$

f(1)

f(2)

從範例測資開始分析

$$\frac{30}{11} = 1 + \frac{19}{11} = 1 + 1 + \frac{8}{11}$$

f(4k) f(2k) f(k)

$$\frac{8}{11} = \frac{1}{\frac{11}{8}}$$

f(k+1) f(k)

$$\frac{11}{8} = 1 + \frac{3}{8}$$

f(2k) f(k)

58 29

$$\frac{3}{8} = \frac{1}{\frac{8}{3}}$$

f(k+1) f(k)

29 28

$$\frac{8}{3} = 1 + \frac{5}{3} = 1 + 1 + \frac{2}{3}$$

f(4k) f(2k) f(k)

28 14 7

$$\frac{2}{3} = \frac{1}{\frac{3}{2}}$$

f(k+1) f(k)

7 6

$$\frac{3}{2} = 1 + \frac{1}{2}$$

f(2k) f(k)

6 3

$$\frac{1}{2} = \frac{1}{\frac{2}{1}}$$

f(k+1) f(k)

3 2

$$\frac{2}{1} = 1 + 1$$

f(2) f(1)

從範例測資開始分析

$$\frac{30}{11} = 1 + \frac{19}{11} = 1 + 1 + \frac{8}{11}$$

f(4k) f(2k) f(k)

$$\frac{8}{11} = \frac{1}{\frac{11}{8}}$$

f(k+1) f(k)

58

$$\frac{11}{8} = 1 + \frac{3}{8}$$

f(2k) f(k)

58 29

$$\frac{3}{8} = \frac{1}{\frac{8}{3}}$$

f(k+1) f(k)

29 28

$$\frac{8}{3} = 1 + \frac{5}{3} = 1 + 1 + \frac{2}{3}$$

f(4k) f(2k) f(k)

28 14 7

$$\frac{2}{3} = \frac{1}{\frac{3}{2}}$$

f(k+1) f(k)

7 6

$$\frac{3}{2} = 1 + \frac{1}{2}$$

f(2k) f(k)

6 3

$$\frac{1}{2} = \frac{1}{\frac{2}{1}}$$

f(k+1) f(k)

3 2

$$\frac{2}{1} = 1 + 1$$

f(2) f(1)

從範例測資開始分析

$$\frac{30}{11} = 1 + \frac{19}{11} = 1 + 1 + \frac{8}{11}$$

f(4k) f(2k) f(k)

$$\frac{8}{11} = \frac{1}{\frac{11}{8}}$$

f(k+1) f(k)

59 58

$$\frac{11}{8} = 1 + \frac{3}{8}$$

f(2k) f(k)

58 29

$$\frac{3}{8} = \frac{1}{\frac{8}{3}}$$

f(k+1) f(k)

29 28

$$\frac{8}{3} = 1 + \frac{5}{3} = 1 + 1 + \frac{2}{3}$$

f(4k) f(2k) f(k)

28 14 7

$$\frac{2}{3} = \frac{1}{\frac{3}{2}}$$

f(k+1) f(k)

7 6

$$\frac{3}{2} = 1 + \frac{1}{2}$$

f(2k) f(k)

6 3

$$\frac{1}{2} = \frac{1}{\frac{2}{1}}$$

f(k+1) f(k)

3 2

$$\frac{2}{1} = 1 + 1$$

f(2) f(1)

從範例測資開始分析

$$\frac{30}{11} = 1 + \frac{19}{11} = 1 + 1 + \frac{8}{11}$$

f(4k) f(2k) f(k)

59

$$\frac{8}{11} = \frac{1}{\frac{11}{8}}$$

f(k+1) f(k)

59 58

$$\frac{11}{8} = 1 + \frac{3}{8}$$

f(2k) f(k)

58 29

$$\frac{3}{8} = \frac{1}{\frac{8}{3}}$$

f(k+1) f(k)

29 28

$$\frac{8}{3} = 1 + \frac{5}{3} = 1 + 1 + \frac{2}{3}$$

f(4k) f(2k) f(k)

28 14 7

$$\frac{2}{3} = \frac{1}{\frac{3}{2}}$$

f(k+1) f(k)

7 6

$$\frac{3}{2} = 1 + \frac{1}{2}$$

f(2k) f(k)

6 3

$$\frac{1}{2} = \frac{1}{\frac{2}{1}}$$

f(k+1) f(k)

3 2

$$\frac{2}{1} = 1 + 1$$

f(2) f(1)

從範例測資開始分析

$$\frac{30}{11} = 1 + \frac{19}{11} = 1 + 1 + \frac{8}{11}$$

f(4k) f(2k) f(k)

118 59

$$\frac{8}{11} = \frac{1}{\frac{11}{8}}$$

f(k+1) f(k)

59 58

$$\frac{11}{8} = 1 + \frac{3}{8}$$

f(2k) f(k)

58 29

$$\frac{3}{8} = \frac{1}{\frac{8}{3}}$$

f(k+1) f(k)

29 28

$$\frac{8}{3} = 1 + \frac{5}{3} = 1 + 1 + \frac{2}{3}$$

f(4k) f(2k) f(k)

28 14 7

$$\frac{2}{3} = \frac{1}{\frac{3}{2}}$$

f(k+1) f(k)

7 6

$$\frac{3}{2} = 1 + \frac{1}{2}$$

f(2k) f(k)

6 3

$$\frac{1}{2} = \frac{1}{\frac{2}{1}}$$

f(k+1) f(k)

3 2

$$\frac{2}{1} = 1 + 1$$

f(2) f(1)

從範例測資開始分析

$$\frac{30}{11} = 1 + \frac{19}{11} = 1 + 1 + \frac{8}{11}$$

f(4k) f(2k) f(k)

236 118 59

$$\frac{8}{11} = \frac{1}{\frac{11}{8}}$$

f(k+1) f(k)

59 58

$$\frac{11}{8} = 1 + \frac{3}{8}$$

f(2k) f(k)

58 29

$$\frac{3}{8} = \frac{1}{\frac{8}{3}}$$

f(k+1) f(k)

29 28

$$\frac{8}{3} = 1 + \frac{5}{3} = 1 + 1 + \frac{2}{3}$$

f(4k) f(2k) f(k)

28 14 7

$$\frac{2}{3} = \frac{1}{\frac{3}{2}}$$

f(k+1) f(k)

7 6

$$\frac{3}{2} = 1 + \frac{1}{2}$$

f(2k) f(k)

6 3

$$\frac{1}{2} = \frac{1}{\frac{2}{1}}$$

f(k+1) f(k)

3 2

$$\frac{2}{1} = 1 + 1$$

f(2) f(1)

遮迴設計

遞迴設計

fact(n)

遞迴設計

fact(n) = n * fact(n-1)

遞迴設計

fact(n) = n * fact(n-1)

5!

遞迴設計

fact(n) = n * fact(n-1)

6 **5!**

遞迴設計

fact(n) = n * fact(n-1)

6! **6** **5!**

遞迴設計

fact(n) = n * fact(n-1)

6! **6** **5!**

$$\frac{11}{8}$$

遞迴設計

fact(n) = n * fact(n-1)

6! **6** **5!**

$$\frac{11}{8} = 1 + \frac{3}{8}$$

遞迴設計

fact(n) = n * fact(n-1)

6! **6** **5!**

$$\frac{11}{8} = 1 + \frac{3}{8}$$

f(**k**)

遞迴設計

fact(n) = n * fact(n-1)

6! **6** **5!**

$$\frac{11}{8} = 1 + \frac{3}{8}$$

f(**2k**) f(**k**)

遞迴設計

fact(n) = n * fact(n-1)

6! **6** **5!**

$$\frac{11}{8} = 1 + \frac{3}{8}$$

f(**2k**) f(**k**)

29

遞迴設計

fact(n) = n * fact(n-1)

6! **6** **5!**

$$\frac{11}{8} = 1 + \frac{3}{8}$$

f(**2k**) f(**k**)

58 **29**

遞迴設計

fact(n) = n * fact(n-1)

6! **6** **5!**

findK(a,b)

a>b

$$\frac{11}{8} = 1 + \frac{3}{8}$$

f(**2k**) f(**k**)

58 **29**

遞迴設計

fact(n) = n * fact(n-1)

6! **6** **5!**

findK(a,b) = 2 * findK(a-b,b)

a>b

$$\frac{11}{8} = 1 + \frac{3}{8}$$

f(**2k**) f(**k**)

58 **29**

遞迴設計

fact(n) = n * fact(n-1)

6! **6** **5!**

findK(a,b) = 2 * findK(a-b,b)

a>b

$$\frac{11}{8} = 1 + \frac{3}{8}$$

f(**2k**) f(**k**)

58 **29**

$$\frac{3}{8}$$

遞迴設計

fact(n) = n * fact(n-1)

6! **6** **5!**

findK(a,b) = 2 * findK(a-b,b)

a>b

$$\frac{11}{8} = 1 + \frac{3}{8}$$

f(**2k**) f(**k**)

58 **29**

$$\frac{3}{8} = \frac{1}{\frac{8}{3}}$$

遞迴設計

fact(n) = n * fact(n-1)

6! **6** **5!**

findK(a,b) = 2 * findK(a-b,b)

a>b

$$\frac{11}{8} = 1 + \frac{3}{8}$$

f(**2k**) f(**k**)

58 **29**

$$\frac{3}{8} = \frac{1}{\frac{8}{3}}$$

f(**k**)

遞迴設計

fact(n) = n * fact(n-1)

6! **6** **5!**

findK(a,b) = 2 * findK(a-b,b)

a>b

$$\frac{11}{8} = 1 + \frac{3}{8}$$

f(**2k**) f(**k**)

58 **29**

$$\frac{3}{8} = \frac{1}{\frac{8}{3}}$$

f(**k+1**) f(**k**)

遞迴設計

fact(n) = n * fact(n-1)

6! **6** **5!**

findK(a,b) = 2 * findK(a-b,b)

a>b

$$\frac{11}{8} = 1 + \frac{3}{8}$$

f(**2k**) f(**k**)

58 **29**

$$\frac{3}{8} = \frac{1}{\frac{8}{3}}$$

f(**k+1**) f(**k**)

28

遞迴設計

fact(n) = n * fact(n-1)

6! **6** **5!**

findK(a,b) = 2 * findK(a-b,b)

a>b

$$\frac{11}{8} = 1 + \frac{3}{8}$$

f(**2k**) f(**k**)

58 **29**

$$\frac{3}{8} = \frac{1}{\frac{8}{3}}$$

f(**k+1**) f(**k**)

29 **28**

遞迴設計

fact(n) = n * fact(n-1)

6! **6** **5!**

findK(a,b) = 2 * findK(a-b,b)

a>b

findK(a,b)

a<b

$$\frac{11}{8} = 1 + \frac{3}{8}$$

f(**2k**) f(**k**)

58 **29**

$$\frac{3}{8} = \frac{1}{\frac{8}{3}}$$

f(**k+1**) f(**k**)

29 **28**

遞迴設計

fact(n) = n * fact(n-1)

6! **6** **5!**

findK(a,b) = 2 * findK(a-b,b)

a>b

$$\frac{11}{8} = 1 + \frac{3}{8}$$

f(**2k**) f(**k**)

58 **29**

findK(a,b) = 1 + findK(b,a)

a<b

$$\frac{3}{8} = \frac{1}{\frac{8}{3}}$$

f(**k+1**) f(**k**)

29 **28**

遞迴設計

fact(n) = n * fact(n-1)

6! **6** **5!**

findK(a,b) = 2 * findK(a-b,b)

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遞迴設計

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遞迴設計

fact(n) = n * fact(n-1)

6! **6** **5!**

findK(a,b) = 2 * findK(a-b,b)

a>b

findK(a,b) = 1 + findK(b,a)

a<b

findK(a,b)

a==b

$$\frac{11}{8} = 1 + \frac{3}{8}$$

f(**2k**) f(**k**)

58 **29**

$$\frac{3}{8} = \frac{1}{\frac{8}{3}}$$

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f(**1**) = **1**

遞迴設計

fact(n) = n * fact(n-1)

6! **6** **5!**

findK(a,b) = 2 * findK(a-b,b)

a>b

findK(a,b) = 1 + findK(b,a)

a<b

findK(a,b) = 1

a==b

$$\frac{11}{8} = 1 + \frac{3}{8}$$

f(**2k**) f(**k**)

58 **29**

$$\frac{3}{8} = \frac{1}{\frac{8}{3}}$$

f(**k+1**) f(**k**)

29 **28**

f(**1**) = **1**