机密★启用前

答案:

(1) $m=\sqrt{1+(m-1)\sqrt{1+m\sqrt{1+(m+1)\sqrt{1+\cdots}}}}$

(2) 约分得:$\frac{x^2-1}{k(x-1)}=\frac{x+1}{k}$

由(1)得:$x+1=\sqrt{1+(x+1-1)\sqrt{1+(x+1)\sqrt{1+(x+1+1)\sqrt{1+\cdots}}}}$

$=\sqrt{1+x\sqrt{1+(x+1)\sqrt{1+(x+2)\sqrt{1+\cdots}}}}$

$=\frac{x+1}{k}$

$\therefore x+1=\frac{x+1}{k}$

① $k=1$ $\because k(x-1)=1\cdot(1-1)=0$ $\therefore$不成立

② $k=-1$ $(x+1=0)\because k(x-1)=-1\cdot(-1-1)=2$ $\therefore$成立

$\because x=k$ $\therefore x=k=-1$

$\therefore$原式$=\frac{-1+1}{-1}=0$

(3) 由(1)得:

$$\sqrt{1+(y-1)\sqrt{1+y\sqrt{1+(y+1)\sqrt{1+\cdots}}}}=\sqrt{1+z\sqrt{1+(z+1)\sqrt{1+(z+2)\sqrt{1+\cdots}}}}$$

$$1+xy=z+1$$
$$xy=z$$

$\because AB,BC$的长度都为整数,$4<AC<5$,$AB=x,BC=y$ $\therefore x+y=6,AC=2\sqrt{5}$

$\because\angle B=90^\circ$ $\therefore\Delta ABC$为直角三角形 在$Rt\Delta ABC$中:$AB^2+BC^2=AC^2$ $x^2+y^2=\left(2\sqrt{5}\right)^2$

$\therefore(x+y)^2=x^2+2xy+y^2=36$ $\therefore x^2+y^2=36-2xy=\left(2\sqrt{5}\right)^2=20$

$\because z=xy$ $\therefore 36-2z=20$ $\therefore z=8$