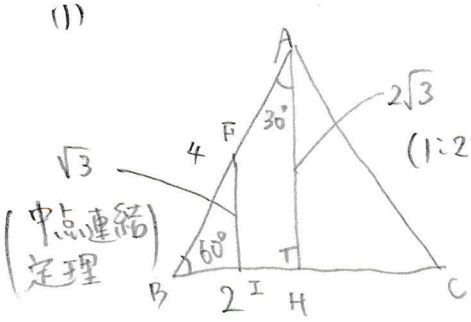
2016 新潟

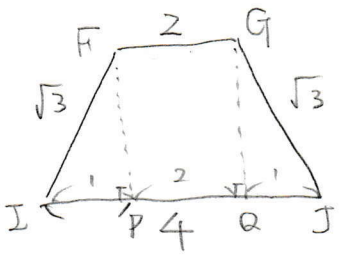
(1)



$AH=2\sqrt{3}$

$FI=\sqrt{3}$

(2)



FGは△ABEで中点連結定理より

$FG=2cm$

$IJ=4cm$　$FI=GJ=\sqrt{3}$

また四角形FIJGは等脚台形なので

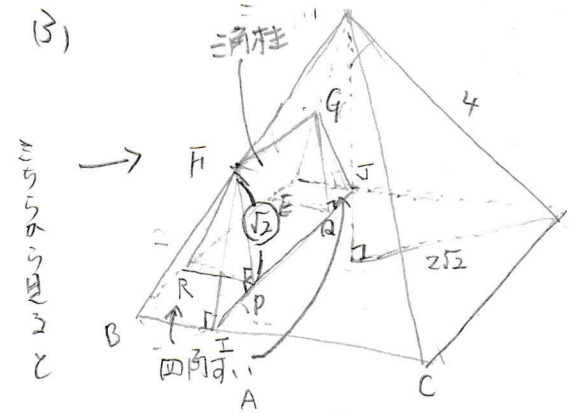
上図より高さFPは三平方の定理で求まる

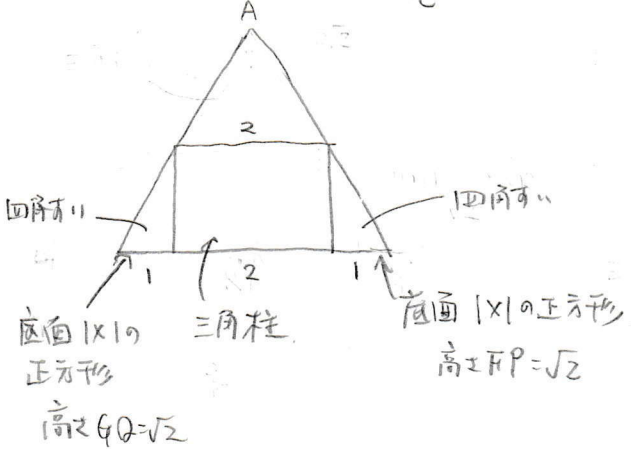
よって $FP=\sqrt{(\sqrt{3})^2-1^2}=\sqrt{2}$

したがって求める面積は　$(2+4)\times\sqrt{2}\times\frac{1}{2}=3\sqrt{2}$

$3\sqrt{2}cm^2$

(3)



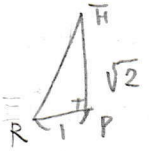


四角すいは

$1\times1\times\sqrt{2}\times\frac{1}{3}=\frac{\sqrt{2}}{3}$

これが2つあるので　$\frac{\sqrt{2}}{3}\times2=\frac{2\sqrt{2}}{3}$ …①

三角柱は底面が△FRPとなり，高さは2なので



$1\times\sqrt{2}\times\frac{1}{2}\times2=\sqrt{2}$ …②

求める体積は①+②なので

$\frac{2\sqrt{2}}{3}+\sqrt{2}=\frac{5\sqrt{2}}{3}$

$\frac{5\sqrt{2}}{3}cm^3$