Problemas sobre centroides

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solve the following problems.

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Problem 1

# problem 1

$−\frac{2}{3}π,\frac{2}{3}π$

$ tilde\left\{x\right\}=r Cos θ$

$y=r Sin θ$

$d L=r d θ$

$d m= P d L$

$\overline{x}=\frac{\int\_{−\frac{2π}{3}}^{\frac{2π}{3}}x dm}{\int\_{−\frac{2π}{3}}^{\frac{2π}{3}}dm}$=$\frac{\int\_{−\frac{2π}{3}}^{\frac{2π}{3}}x P d L}{\int\_{−\frac{2π}{3}}^{\frac{2π}{3}}P d L}$=$\frac{\int\_{−\frac{2π}{3}}^{\frac{2π}{3}}x d L}{\int\_{−\frac{2π}{3}}^{\frac{2π}{3}}d L}$=$\frac{\int\_{−\frac{2π}{3}}^{\frac{2π}{3}}r Cos θ r dθ}{\int\_{−\frac{2π}{3}}^{\frac{2π}{3}}rdθ}$=$\frac{r^{2}\int\_{−\frac{2π}{3}}^{\frac{2π}{3}}Cos θ dθ}{\int\_{−\frac{2π}{3}}^{\frac{2π}{3}}d θ}$=$r Sin θ \int\_{−\frac{2π}{3}}^{\frac{2π}{3}}$=$\frac{r\left[0.86+0.86\right]}{\frac{4}{3}π}$

=$300m\left(\frac{1.732}{4.188}\right)=124 m$



problem 2

# problem 2

$\left[\frac{π}{2}, −\frac{π}{2}\right]$

$x=r Cos θ$

$y= r Sen θ$

$dL=rdθ$

$w=\left(0.5\frac{lb}{ft}\right)πft$

$Σfy$

$Ay=w$

$\overline{\left\{x\right\}}=\frac{\int\_{l}^{}r Cos θ r d θ}{\int\_{l}^{}rdθ}$=$\frac{r^{2}\int\_{−\frac{π}{2}}^{\frac{π}{2}}Cos θ dθ}{r\int\_{−\frac{π}{2}}^{\frac{π}{2}}d θ}$=$\frac{2r}{π}$

$B\_{x}−A\_{x}=0$

$A\_{y−w=0}$

$A\_{y}=π lb$

$−\overline{\left\{x\right\}}w+4Bx=0$

$−\left(\frac{2r}{π}\right)\left(πlb\right)+4Bx=0$

$\left(4 ft\right)B\_{x}=\left(\frac{2r}{π}\right)\left(πlb\right)$

$B\_{\_{x}=1 lb}$

$\frac{w}{L}=0.5\frac{lb}{ft}$

$L=π\left(2ft\right)$

$=πlb$

$B\_{x}=A\_{x}=1 lb$

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