??
×
ap-
prox-
i-
mate
n
×
x
$A(x_i)$
i^{th}
i
x
≈
$\sum_{i=1}^{n}$ $\Big[Area\times$
$thickness\Big]$
=
$\sum_{i=1}^{n} A(x_i)_i$.
$_by_cross_sectionVolumeByCross - SectionalAreaThevolumeofasolid, orientedalongthe-axiswithcross-$
$sectionalareafromto, isV =$
$\int_a^b A(x)dx$.
$_disk0Findingthevolumeofasolid Findthevolumeofapyramidwithasquarebaseofsidelength10inandaheightof5in.T$
$A(x)$
x =
2
x =
0
$2x$
$A(x) =$
$(2x)^2 =$
$4x^2$
x =
3
??
2
Δx_i
$36\Delta {x_i}^3$
??
x =
3_area1a_3D
n
n
$(2x_i)^2\Delta x$
x_i
x
Δx

$$Approximatevolume = \sum_{i=1}^{n}(2x_i)^2\Delta x.$$

$n \to$
∞
??
$\lim_{n\to\infty} \sum_{i=1}^{n}(2x_i)^2\Delta x$
=
$\int_0^5 4x^2dx$
=
$\frac{4}{3}x^3\Big|_0^5$
=
$\frac{500}{3}in^3 \approx$
$166.67in^3$.
$\frac{1}{3}\times$
$areaofbase\times$
$height$
??
só-
lid
of
re-
vo-
lu-
tion
y =
$f(x)$
x =
a
x =
b
$R(x)$
x
$\pi R(x)^2$
??
$_methodTheDiskMethodLetasolidbeformedbyrevolvingthecurvefromtoaroundahorizontalaxis, andletbetheradiusc$
$sectionaldiskat.Thevolumeofthesolidis V =$
$\pi \int_a^b R(x)^2dx$.
$_disk1Findingvolumeusingthe DiskMethodFindthevolumeofthesolidformedbyrevolvingthecurve, fromto, aroundt$
$-adisk-$
$-atwithradius.InFigure??(b)thewholesolidispictured, alongwiththedifferentialelement.$
$\pi R(x_i)^2\Delta x$
$R(x_i)$
Δx
$R(x_i)$
x
$R(x_i) =$
$1/x_i$
??
n
$\sum_{i=1}^{n}\left(\frac{1}{}\right)^2$