LESSON 1: AREA OF PLANE REGIONS

Objective: 1. To set up and solve integrals to find areas bounded by two or more graphs.

Setting Up Integrals to Represent Area Between Two Curves

In terms of x, Area=$\int_a^b$(Top curve - Bottom curve)dx

In terms of y, Area=$\int_{f(a)}^{f(b)}$(Right curve - Left curve)dy

Examples

Find the area bounded by the curves in each problem below.

1. $f(x)=x^2$ and $g(x)=x^3$
2. $f(y)=y^2+1, x=0, y=-1,$ and $y=2$

Problems

Find the area bounded by the curves in each problem below.

1. $f(x)=x^2-4x+3$ and $g(x)=-x^2+2x+3$
2. $f(x)=(x-1)^3$ and $g(x)=x-1$
3. $y=\frac{1}{x^2}, y=0, x=1,$ and $x=5$
4. $y=x-5$ and $y^2=2x-2$
5. $f(x)=\sin 2x$ and $g(x)=\cos x$ on $\left[\frac{\pi}{6},\frac{5\pi}{6}\right]$