



A Modular Presentation System for the Calculus Sequence

6.1 Areas Between Curves

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How to Find the Area Between Two Curves

- ▷ Slice, Approximate, Integrate
- ▷ How to Find the Area Between Two Curves
- ▷ Area Between Intersecting Curves
- ▷ Additional Areas
- ▷ Boundaries with Changing Formulas

1. *Graph the curves and draw a representative rectangle.*
2. *Find the limits of integration.*
3. *Write a formula for $f(x) - g(x)$.*
4. *Integrate $[f(x) - g(x)]$ from a to b .*



Area Between Intersecting Curves

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EXAMPLE: Find the area of the region enclosed by the parabola $y = 2 - x^2$ and the line $y = -x$.



Additional Areas

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Find the area of the region enclosed between the given functions $y = f(x)$ and $y = g(x)$.

EXAMPLE: $f(x) = x^3, g(x) = 4x$

EXAMPLE: $f(x) = 16x, g(x) = x^5$

EXAMPLE: $f(x) = 3 - x, g(x) = x^2 + 2x + 3$



Boundaries with Changing Formulas

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EXAMPLE: Find the area of the region in the first quadrant that is bounded above by $y = \sqrt{x}$ and below by the x -axis and the line $y = x - 2$.