# Integration: Applications <br> Introduction to Engineering Mathematics 

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Reminder: area under the curve


$$
\text { Area }=\int_{a}^{c_{1}} f(x) d x-\int_{c_{1}}^{c_{2}} f(x) d x+\int_{c_{2}}^{b} f(x) d x
$$

## Area between two curves



## Recipe for finding the area

(1) Make a figure
(2) Determine intersection points
(3) Figure out which curve is upper/lower
(4) Integrate

## Example

Find the area bounded by $y=\sin x, y=0$, and $x=\frac{3 \pi}{2}$.

## Example

Find the area of the region between the curves $y=x^{2}-2 x$ and $y=4-x^{2}$.

## Example

Find the area of the region between $x=12-y^{2}$ and $y=-x$.

