# Areas Between Curves: Examples

1. Sketch the region enclosed by the curves and find its area: $y = \cos x$, $y = 1 - 2x/\pi$

2. Sketch the region enclosed by the curves and find its area: $y^2 + x = 1$, $x - y^2 = -9$

3. Sketch the region enclosed by the curves and find its area: $x = 3y^2$, $x = 4 - y^2$

4. Sketch the region enclosed by the curves and find its area: $y = x^2$, $y = 6 - |x|$

5. Evaluate the integral and interpret it as the area of a region. Sketch the region.

$$\int_0^{2\pi} |\sin(2x) - \cos(x)| dx$$

6. Find the area between $y = \dfrac{1}{x}$ and $y = \dfrac{1}{x^2}$ from $x = 1$ to $x = 3$.

7. Find the area enclosed by the curves $y = \ln x$ and $y = 1$ from $x = 1$ to $x = 2e$.

8. Find the area of the region bounded by the curves $y = \sqrt{x - 1}$ and $y = \dfrac{x - 1}{2}$.

9. Find the area of the region in the first quadrant bounded by the curves $y = x^2$ and $y = 6x - x^3$.

10. Two buckets, A and B, are being filled by different hoses. The given figure represents the rate at which they are being filled in gal/min.
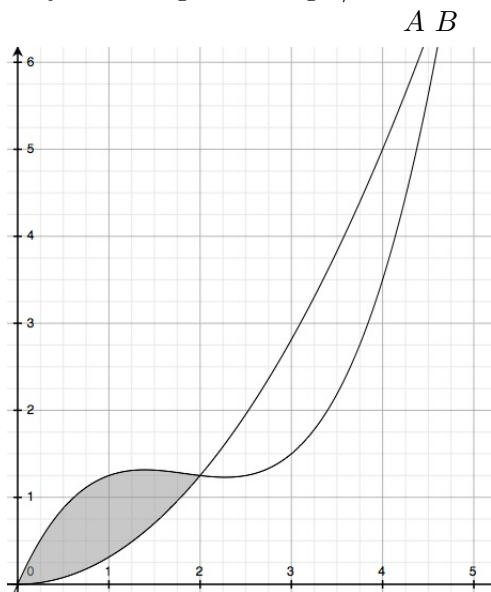
   (a) Which bucket has more water after 2 minutes?

   (b) What is the meaning of the shaded region?

   (c) Which bucket has more water after 3 minutes?

   (d) Estimate the time at which the bucket have the same amount of water.