Area between curves, dy **Name:**
AP Calculus

Let's say we're given x as a function of y, or $x = g(y)$. If this is the case, then the integral $\int_c^d g(y)dy$ = signed area between graph and y-axis for $[c, d]$.

Let's first look at a straightforward integral that integrates with respect to y:

Evaluate: $\int_{-5}^{5} (y^2 - 4)dy$

You didn't have to use your calculator for this problem, but could you have?

Now let's find some areas between curves with respect to y.

Find the area enclosed by the graphs of $x = y^2 - 4$ and $x = y + 2$.

Find the area bounded by the graphs of $x = \sin y$ and $x = 1 - \cos y$ over $[-\frac{\pi}{2}, \frac{\pi}{2}]$.

(Note: As you look at the graph below, keep in mind that $\frac{\pi}{2} \approx 1.57$)