

Directions: Begin in cell #1. Sketch and shade the area, set up the definite integral(s), and evaluate the definite integral(s). To advance in the circuit, hunt for your answer and write 2 in the blank. Do that problem and continue in this manner until you complete the circuit. You should not need any technology, however, attach separate paper if needed.

<p>Answer: $\frac{1}{3}e^3 - 2e^2 + 5e - \frac{23}{6}$</p> <p>#1 This first one is just to have you think about the idea... So no calculus needed here. Just sketch and calculate. A circle is inscribed in a square. If the perimeter of the square is 40, find the area of the square not covered by the circle.</p>	<p>Answer: $\sqrt{2} - 1$</p> <p># _____ Find the area of the region enclosed by the graphs of $f(x) = \sqrt{x}$ and $g(x) = \frac{1}{2}x$.</p>
<p>Answer: $\frac{7}{6}$</p> <p># _____ Find the area of the region enclosed by the graphs of $f(x) = x\sqrt{9+x^2}$ and $g(x) = -x\sqrt{9+x^2}$ from $x = 0$ to $x = 4$.</p>	<p>Answer: 26</p> <p># _____ Find the area of the region completely enclosed by the graphs of $y = x$ and $y = x^2$.</p>

Answer: $4\pi - 8$

_____ Calculate the area of the region enclosed by the graphs of $y = \sec^2 x$ and $y = x$ for $-\frac{\pi}{4} \leq x \leq \frac{\pi}{4}$.

Answer: $100 - 25\pi$

_____ Find the area in the first quadrant between the line $y = 2x$ and the x-axis from $x = 0$ to $x = 5$.

Answer: $\frac{32}{3}$

_____ Find the area of the region bounded by the parabolas $y = 2x - x^2$ and $y = x^2$.

Answer: $\frac{1}{3}$

_____ Find the area of the first quadrant region enclosed on the left by the y-axis, above by the graph of $y = \cos x$, and below by the graph of $y = \sin x$.

<p>Answer: 25</p> <p># _____ Find the area between the function $f(x) = 3x^2$ and the x-axis from $x=1$ to $x=3$.</p>	<p>Answer: $\frac{9}{8}$</p> <p># _____ Find the total area enclosed by the graphs of $y = x^3$ and $y = -x^2 + 2x$. Hint: There are two different areas you need to find, and then sum them.</p>
<p>Answer: $\frac{4}{3}$</p> <p># _____ Calculate the area of the region enclosed by $y = \sin x$ and $y = e^{-x}$ on the interval $\left[0, \frac{\pi}{6}\right]$.</p>	<p>Answer: $\frac{196}{3}$</p> <p># _____ Find the area of the region bounded above by the graph of $y = (x - 2)^2 + 1$, below by the graph of $y = \frac{\ln x}{x}$, to the left by the graph of $x = 1$, and to the right by the graph of $x = e$.</p>

Answer: $\frac{37}{12}$

_____ Find the area of the region enclosed by the graphs of $y = \sqrt{x}$, $y = 2 - x$, and $y = 0$.

Answer: $\frac{\sqrt{3}}{2} - e^{-\frac{\pi}{6}}$

_____ Find the area of the region enclosed above by the bell-shaped curve of $y = \frac{8}{1+x^2}$ and below by the horizontal line $y = 4$.

Answer: 2

_____ Find the area of the region enclosed by the graphs of $x = 2y^2$ and $x - y = 1$.

Answer: $\frac{1}{6}$

_____ Find the area of the region bounded above by $y = 5$ and below by $y = x^2 + 1$.