Homework 9 - Math 142 **Name:** _____

1. Find the volume of the region under $y = \sqrt{\sin x}$ from $x = 0$ to $x = \pi$ when it is revolved around the x-axis.

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2. Find the volume of the region under the curve $y = \dfrac{1}{x}$ from $x = 1$ to $x = 2$ when it is revolved around the x-axis.

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3. Let $\mathcal{R}$ be the region between the curve $y = 2 - x^2$ and the line $y = 1$. When you revolve this region around the x-axis, you get a ring shape. Use the washer method to find the volume of this ring.

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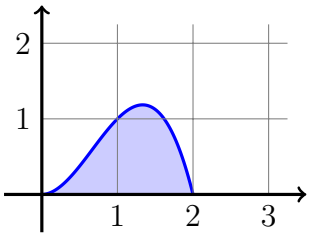
4. Find the volume of the solid obtained by revolving the region under $y = 2x^2 - x^3$ (shown below) around the y-axis.



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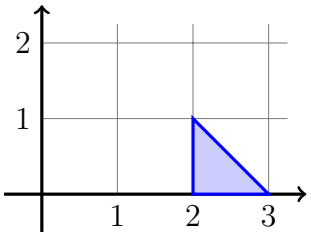
5. What is the volume of the solid obtained by revolving the triangle shown below around the y-axis?



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6. What is the volume of the solid obtained by revolving the region beneath $y = e^{-x}$ from $x = 0$ to ∞ around the x-axis?

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7. Find the length of the curve $y = \frac{4}{3}x^{3/2}$ from $x = 0$ to $x = 6$.

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8. Set up a definite integral that represents the length of Archimedes spiral (shown below), which is given by the parametric equations $x(t) = t\cos t$, $y(t) = t\sin t$ from $t = 0$ to $t = 2\pi$. You don't need to calculate the integral.