Math 102 **Problem Set # 1** **9/2/19**

1. Evaluate the following integrals:
   (a) $\int (2x+3)\,dx$
   (b) $\int (3x-1)^{234}\,dx$
   (c) $\int \sqrt{2+5y}\,dy$
   (d) $\int \dfrac{3r\,dr}{\sqrt{1-r^2}}$
   (e) $\int t^2\left(1+2t^3\right)^{-2/3}$
   (f) $\int \left(\sqrt{x}+\dfrac{1}{\sqrt{x}}\right)dx$
   (g) $\int \left(x^2-\sqrt{x}\,\right)dx$
   (h) $\int (2-7t)^{2/3}\,dt$
   (i) $\int x\sqrt{2x^2+1}\,dx$
   (j) $\int \dfrac{dy}{(3y+2)^2}$
2. Compute the exact area bounded by the x-axis, the given curve $y=f(x)$, and the given vertical lines:
   (a) $y=x^2+1$, $x=0$, $x=3$
   (b) $y=2x+3$, $x=0$, $x=1$
   (c) $y=\sqrt{2x+1}$, $x=0$, $x=4$
   (d) $y=\dfrac{1}{\sqrt{2x+1}}$, $x=0$, $x=4$
   (e) $y=\dfrac{1}{(2x+1)^2}$, $x=1$, $x=2$
   (f) $y=x^3+2x+1$, $x=0$, $x=2$
   (g) $y=x\sqrt{2x^2+1}$, $x=0$, $x=2$
   (h) $y=\dfrac{x}{\sqrt{2x^2+1}}$, $x=0$, $x=2$
3. Find the area between the curve $y=4-x^2$ and the x-axis.
4. Find the area between the curve $y=\sqrt{1-x}$ and the coordinate axes.