1. Give an explanation in your own words for why $x = \frac{1}{x^{-1}}$.

2. Simplify $\dfrac{5\left(\frac{1}{x}\right)}{x^{-3}}$

3. Write in your own words how you know when to write $\lim_{x\to\infty}$ and when to stop writing it. Then evaluate the following limits being obsessive about your use of notation. Note that you must give an **algebraic** justification for your answer, possibly with the use of L'Hôpital's Rule.

   (a) $\displaystyle\lim_{x\to\infty} \frac{\ln(x)}{\sqrt[10]{x}}$

   (b) $\displaystyle\lim_{x\to\infty} \frac{\sqrt{3x^2-1}}{3-x}$

4. What do the limits above imply about the graphs $f(x) = \frac{\ln(x)}{\sqrt[10]{x}}$ and $g(x) = \frac{\sqrt{3x^2-1}}{3-x}$?

5. Do either $f(x)$ or $g(x)$ have vertical asymptotes? Justify your answer.

6. Determine if the following statements are True or False. Give an explanation. Bonus points for the most succinct explanation.

   (a) $\int h(x)j(x)\,dx = \left(\int h(x)\,dx\right)\left(\int j(x)\,dx\right)$

   (b) $\int h(x)+j(x)\,dx = \left(\int h(x)\,dx\right)+\left(\int j(x)\,dx\right)$

   (c) $\int \dfrac{h(x)}{j(x)}\,dx = \dfrac{\int h(x)\,dx}{\int j(x)\,dx}$

   (d) k is a constant, $\int kh(x)\,dx = k\int h(x)\,dx$

   (e) $\int (h(x))^2\,dx = \dfrac{1}{3}(h(x))^3 + C$

7. Evaluate $\int (x+2)^2\,dx$

8. Convert 60 miles per hour into feet per second.

9. Write the equation for the top-half of the circle of radius 4 centered at $x = 10$ on the x-axis.