Math 127
Exam 1 Practice Problems

1. Express the following number in scientific notation: .0001093

2. Express the following number in ordinary decimal notation: 4.03267×10^4

3. True or False:

   (a) $(a+b)c = ac + bc$
   (b) If $ab = 1$, then either $a = 1$ or $b = 1$ or both a and b equal 1
   (c) $\frac{a}{b} + \frac{c}{d} = \frac{a+c}{b+d}$
   (d) $\frac{a+c}{b} = \frac{a}{b} + \frac{c}{b}$
   (e) $5^{\frac{1}{2}} = \frac{1}{5^2}$
   (f) $(a+b)^2 = a^2 + b^2$
   (g) $x = 0$ is a solution to the equation $\frac{x^2}{x} = 0$

4. Simplify the following:

   (a) $\left(\frac{3}{4}\right)^{-2}$
   (b) $8^{\frac{4}{3}}$
   (c) $\left(\frac{y^{12}}{25z^4}\right)^{-\frac{3}{2}}$
   (d) $\sqrt[5]{32x^{11}y^{14}z^8}$
   (e) $\left(\frac{(5xyz)^2 z^{-2}}{2x^{-2}y^2z^{-4}}\right)^{-1}$

5. Rationalize the denominator in the following expressions:

   (a) $\frac{3x}{\sqrt[3]{x}}$
   (b) $\frac{2x+3}{\sqrt{2x}-1}$

6. Perform the indicated operations and simplify:

   (a) $3(2x^3 - x^2 + 5x) - 2x(3x^3 - 2x^2 + 5x - 3)$
   (b) $(2x^2 + 3x - 2)(x - 2)$
   (c) $(2x+1)^3$
   (d) $(x^{\frac{1}{3}} + y^{\frac{1}{3}})(x^{\frac{2}{3}} - x^{\frac{1}{3}}y^{\frac{1}{3}} + y^{\frac{2}{3}})$

7. Factor each of the following expressions completely:

   (a) $2x^2 + x - 6$

   (b) $50x^2 + 45x - 18$

   (c) $9x^2 - 49y^6$

   (d) $8x^3 - y^3$

   (e) $6x^3y - 27x^2y - 15xy$

   (f) $3x^3 + x^2 - 3x - 1$

   (g) $x^6 - 1$

8. Simplify the following expressions:

   (a) $\dfrac{3x^2 - 10x + 3}{x^2 - 1} \cdot \dfrac{x^2 + x - 2}{x^2 - 9}$

   (b) $\dfrac{2x^2 + 4}{2x^2 + 7x - 4} - \dfrac{x - 1}{x + 4}$

   (c) $\dfrac{\frac{1}{x} + \frac{3}{x-2}}{\frac{4}{x-1} - \frac{2}{x-2}}$

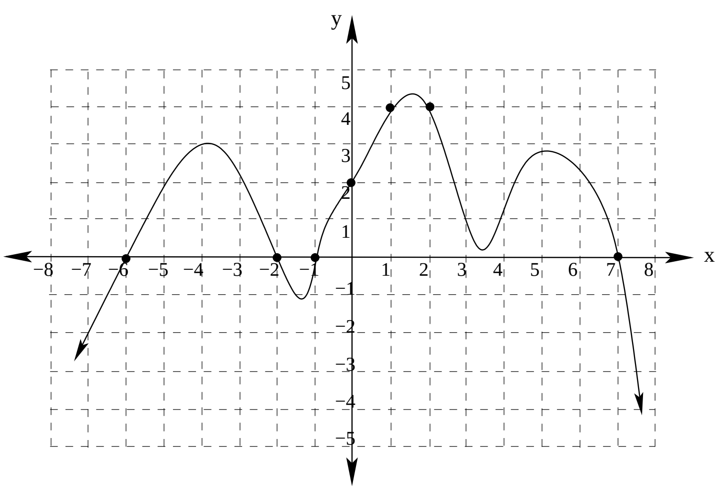
   (d) $\dfrac{\frac{3}{2x+2h+1} - \frac{3}{2x+1}}{h}$

9. Sketch the graphs of the following equations:

   (a) $y = 3x - 2$

   (b) $y = 4 - x^2$

10. Based on the graph given below:



   (a) Find the coordinates of all x intercepts.

   (b) Find the coordinates of all y intercepts.

   (c) Find the x-value(s) when $y = 4$