

This assignment is due by 3:30pm on January 29, 2009 You can turn it in to me in class or drop it by the office, **Blocker 640D**. Be sure that you follow the homework rules, they can be found on your syllabus. Please work the problems in the order that they are listed. For the regression problems, be sure to use at least 4 decimal digits in the formulas.

1. Jason bought a four year old Hummer for \$75,000. Nine years later he sold it for \$21,000. Assume that the value of the RV depreciates linearly.

- Find linear equation that gives the value of the Hummer where x is the age of the Hummer.
- How much did the Hummer cost when it was new?
- What is the rate of depreciation?

2. An on-line tennis site has found that when a certain type of racket is priced at \$120 then 8 thousand rackets are demanded and for a price of \$230 then 3 thousand rackets are demanded. The supply equation is $x - 40p + 3568 = 0$. p is the price of the rackets in dollars and x is the number of rackets.

- Assuming the demand function is linear, find the demand equation.
- Find the equilibrium quantity.
- Find the equilibrium price.

3. The movie Finding Nemo opened in the US in the summer of 2003. The number of screens that this movie was shown on was given in the following table.^a

week number	3	4	5	6	7
number of screens	3425	3404	3333	2902	2643
week number	8	9	10	11	12
number of screens	2480	2025	1777	1502	1037

- Determine the equation of the least-squares line for this data.
Use the regression line to find the following predictions.
- On how many screens was this movie shown in the first week?

4. Find the domain of these functions.

(a) $f(x) = \frac{x-6}{\sqrt{x^2-16}}$

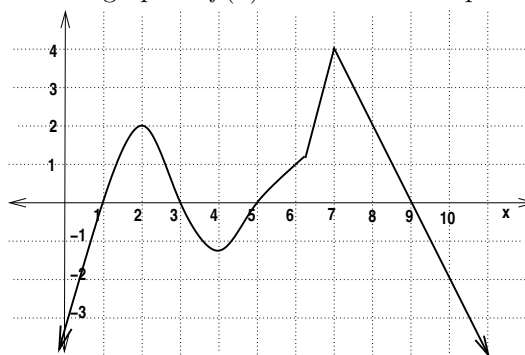
(b) $y = \sqrt[5]{2x+5}$

5. Find the domain of these functions.

(a) $y = \frac{x^2+4}{x^3+2x^2-8x}$

(b) $y = \sqrt{3230-37x}$

6. Use the graph of $f(x)$ to answer these questions.



- Find the intervals where $f(x) > 0$
- Find the value(s) of x where $f(x) = 2$
- $f(6) =$
- $f(4) =$

7. A company has developed a new and improved widget. The marketing department has conducted some product research into how many widgets would be demanded by consumers at various prices. The company has also looked into the costs of different numbers of widgets. All of this information is located in the table.

widgets	1,500	3,000	4,500	6,000
price(\$)	29	23	17	13
production cost(\$)	51,200	60,350	72,550	87,500

- Assuming that the demand of the widgets by consumers is linear, find the price-demand function.
- According to the price-demand function an increase of 2000 items would have what effect on the price of the widgets. (Be specific with your answer.)
- When the price is \$9.40, approximately how many widgets will be demanded by consumers?

^aData obtained from: <http://www.imdb.com/>