MTHSC 102 Section 1.11 – Cubic Functions and Models

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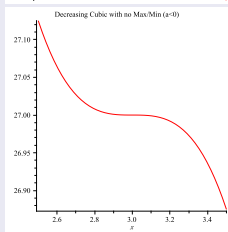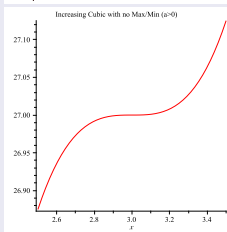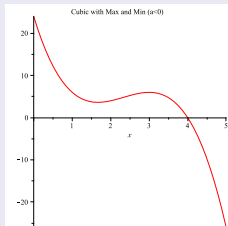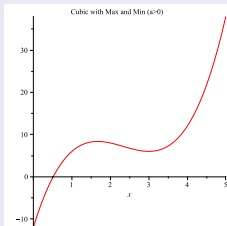
ALGEBRAICALLY   A cubic model has an equation of the form
$$f(x) = ax^3 + bx^2 + cx + d,$$
where $a \neq 0$ is a constant and b, c and d are constants.

GRAPHICALLY A cubic function has one of the following forms.

NOTE

Suppose that $f(x) = ax^3 + bx^2 + cx + d$ is a cubic function. Then,

$A>0$
- f begins and ends increasing.
- f is concave down and then concave up.
- $\lim_{x \to \infty} f(x) = \infty$.
- $\lim_{x \to -\infty} f(x) = -\infty$

$A<0$
- f begins and ends decreasing.
- f is concave up and then concave down.
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The average price in dollars per 1000 cubic feet of natural gas for residential use in the US for selected years from 1980 through 2005 is given in the following table.

Year	1980	1982	1985	1990	1995	1998	2000	2003	2004	2005
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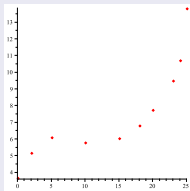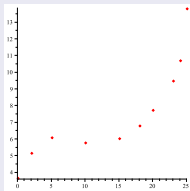
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1 Find a cubic model for this data.

2 Would it be wise to use this model to predict future gas prices?

3 Estimate the price in 1993.

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4. Consider that thee may be two equally good choices of model.