

Name: _____

CALCULUS GT

Suggested Summer Packet

This packet includes skills that you will be expected to know upon entering Calculus GT. Please make sure you can complete each problem correctly.

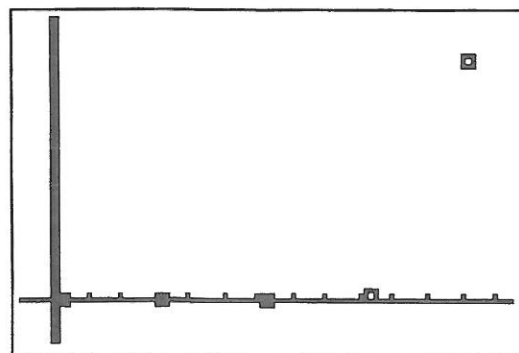
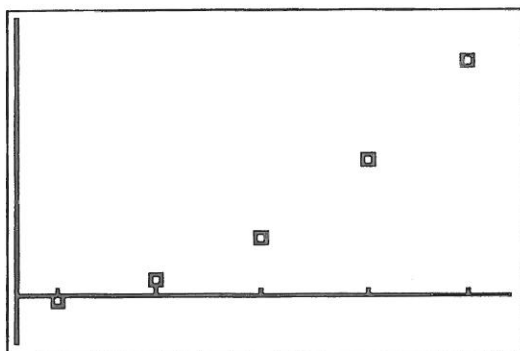
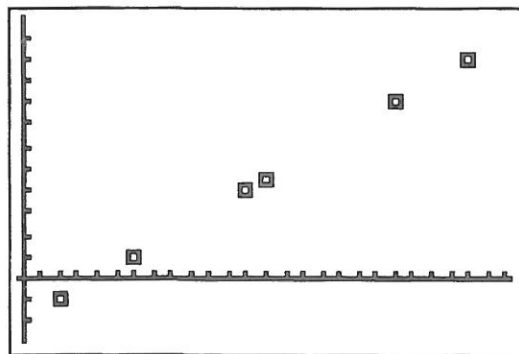
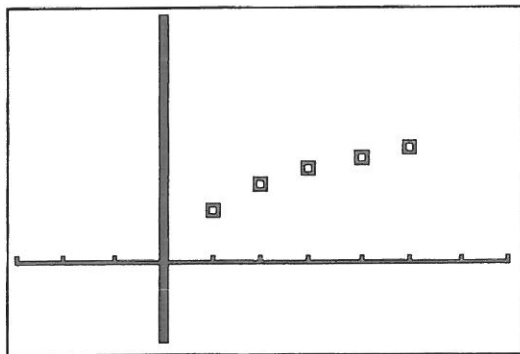
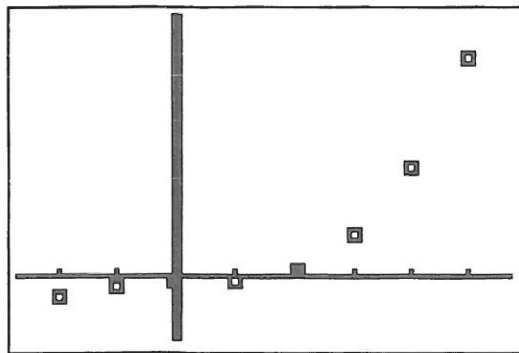
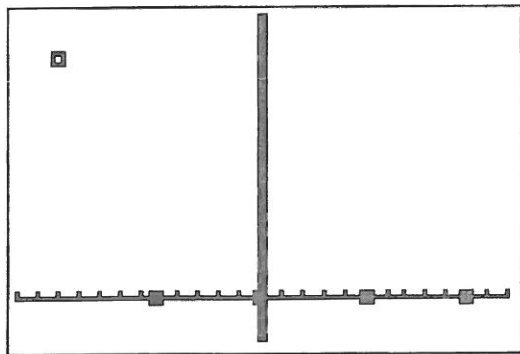
We encourage you to review the following:

- Choosing an appropriate model
- Calculator skills to create a regression model
- Factoring
- Limits

Please bring the packet with you the first day of school.

Modeling Practice

Classify each scatter plot as linear, quadratic, cubic, exponential, logistical, or logarithmic. State your reasoning for each classification.



Find a best fit model for each set of data. Use the data to respond to the questions that follow. Round to the nearest hundredth when necessary.

1. The table shows the revenues (in millions of dollars) for eBay from 2004 to 2009, where t is the years since 2000. *Brief Calculus, Ron Larson, 9th ed, p. 143*

t	4	5	6	7	8	9
R	3,271	4,552	5,970	7,672	8,541	8,727

Model: _____

What is the expected revenue for eBay in 2011?

When should we expect the revenue to reach \$9 billion?

2. The table shows the median prices (in thousands of dollars) of new privately owned homes in the United States from 2000 to 2009. *Brief Calculus, Ron Larson, 9th ed, p. 143*

<i>year</i>	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
<i>Price</i>	169	175.2	187.6	195	221	240.9	246.5	247.9	232.1	216.7

Model: _____

What is the expected median price of a house in the year 2010?

According to your model, when do housing prices reach \$235,000?

3. The table shows the numbers of cell phone subscribers S (in millions) in the United States from 2000 to 2009. *Brief Calculus, Ron Larson, 9th ed, p. 301*

<i>year</i>	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
<i>Number of Subscribers (millions)</i>	109.5	128.4	140.8	158.7	182.1	207.9	233	255.4	270.3	285.6

Model: _____

How many cell phone subscribers should we expect in 2015?

In which year should we expect 500 million cell phone subscribers?

Factoring Review: Factor each completely.

1.) $x^2 + 8x + 15$

2.) $x^2 - 7x + 12$

3.) $x^2 - 9$

4.) $4x^2 - 81y^2$

5.) $2x^2 - 98$

6.) $3x^2 + 16x + 5$

7.) $2x^2 + x - 6$

8.) $6x^2 + 5x - 4$

9.) $7x^2y - 14xy - 21y$

10.) $x^3 - 1$

11.) $8x^3 + 27$

12.) $2xy^4 - 50xy^2$

13.) $x^4 + 11x^2 + 30$

14.) $x^5 + x^3 - 12x$

15.) $8x^2 + 2xy + 12x + 3y$

16.) $12a^3 - 9a^2 + 4a - 3$

17.) $5x^2 - 15x - 20$

18.) $x^3 - 4x$

19.) $x^2 - x - 30$

20.) $x^2 + 4x - 12$

21.) $x^2 + x - 6$

Limits Review: Find each limit. If the limit Does Not Exist, must show from the left and right.

1.) $\lim_{x \rightarrow -7} 2x + 5$

2.) $\lim_{x \rightarrow -3} \frac{x^2 + 2x - 3}{x^2 - 9}$

3.) $\lim_{x \rightarrow 2} 8$

4.) $\lim_{x \rightarrow 1} \frac{y-1}{\sqrt{y+3}-2}$

5.) $\lim_{x \rightarrow 1} \frac{1-\sqrt{x}}{1-x}$

6.) $\lim_{x \rightarrow 1} \frac{x^4-1}{x^3-1}$

7.) $\lim_{x \rightarrow 7} \frac{x-7}{x^2-49}$

8.) $\lim_{x \rightarrow 2} \frac{x+2}{x^2-4}$

9.) $\lim_{x \rightarrow 0} \frac{(x+h)^2 - x^2}{h}$

10.) $\lim_{x \rightarrow 0} \frac{\frac{1}{2+x} - \frac{1}{2}}{x}$

11.) $\lim_{x \rightarrow 4} \frac{4-x}{x-4}$

12.) $\lim_{x \rightarrow 0} \frac{(2+x)^3 - 8}{x}$

13.) $\lim_{x \rightarrow \infty} \frac{x^2+x}{x^5+2x^4+x^3}$

14.) $\lim_{x \rightarrow \infty} \frac{4x^5+x}{3x^5+2x^4+x^3}$

15.) $\lim_{x \rightarrow \infty} \frac{x^4+x^3-3x^2}{x^3+2x^2+x}$

Find the following from the sketch of $y = f(x)$

1. $\lim_{x \rightarrow 1^+} f(x) =$ _____
2. $\lim_{x \rightarrow 1} f(x) =$ _____
3. $\lim_{x \rightarrow -2^-} f(x) =$ _____
4. $\lim_{x \rightarrow -2} f(x) =$ _____
5. $f(-2) =$ _____
6. $f(-4) =$ _____
7. $\lim_{x \rightarrow \infty} f(x) =$ _____
8. $\lim_{x \rightarrow -\infty} f(x) =$ _____
9. Does $\lim_{x \rightarrow 1} f(x) = f(1)$? _____

