## Algebraic Connections: $3^{\text {rd }}$ Nine Weeks Examination

## DO NOT WRITE ON THIS EXAM!

Use your own paper, and/or the computer, to report the answers to the questions. Make sure you use the problem numbers, show all work, document your solutions, and include the answer to the question! Name, Date, Period, and What it is.

1. During this examination, use at least TWO of the following technologies, in an effective attempt to solve two different questions below. Use Geometer's SketchPad, Excel, TI-Interactive!, or Graphical Analysis. Report the following information with your use: a) what problem you were solving, b) which of the technologies was used, and c) why you think this was an effective use of the technology to solve the problem.
2. Using the following data from the Data and Story Library give the following information:
a) Two different Histograms that give some insight into the data.
b) An explanation of the patterns revealed in the two different Histograms.
c) A Scatter Plot that shows some insight into the data.
d) An explanation of the pattern shown in the Scatter Plot.

In April 1979 the Albuquerque Police Department began a special enforcement program aimed at countering DWI (driving while intoxicated) accidents. The program was composed of a squad of police officers, Breath Alcohol Testing (BAT) devices, and a van which houses a BAT device and is used as a mobile BAT station (Batmobile). These data were collected by the Division of Governmental Research of the University of New Mexico under a contract with the National Highway Traffic Safety Administration of the Department of Transportation to evaluate the Batmobile program.

1. QTR: Quarter
2. ACC: Injuries and fatalities from Wednesday to Saturday nighttime accidents
3. FUEL: Fuel consumption (million gallons) in Albuquerque

| QTR | ACC | FUEL |
| :--- | :--- | :--- |
| 1 | 192 | 32.592 |
| 2 | 238 | 37.250 |
| 3 | 232 | 40.032 |
| 4 | 246 | 35.852 |
| 5 | 185 | 38.226 |
| 6 | 274 | 38.711 |
| 7 | 266 | 43.139 |
| 8 | 196 | 40.434 |
| 9 | 170 | 35.898 |
| 10 | 234 | 37.111 |
| 11 | 272 | 38.944 |
| 12 | 234 | 37.717 |

3. Calculate Ferte's grade for the $3^{\text {rd }}$ Nine Weeks based on the Portfolio scores listed below, and the fact that Ferte made 213 out of 377 on this Examination. Show your work.

| Item | $3^{\text {rd }}$ 9 weeks <br> Pre-Portfolio | $\mathbf{3}^{\text {rd }} \mathbf{9}$ weeks <br> Portfolio |
| :--- | :--- | :--- |
| OverArching Process | 3 | 4 |
| 7 Parts of AlgConn | 2 | 3 |
| Ability to Test | 2 | 2 |
| Technology | 4 | 4 |
| Growth | 2 | 3 |
| Free/Web | 3 | 2 |
| Journal | 3 | 4 |

4. Construct a Rectangle and a Square, and use the GEOMTRY program to verify these figures are what there are reported to be.
5. Given the following data set showing the Percent of Homes in the U. S. Heated with Electricity and Oil, answer these questions.
a) Make a Scatter Plot of both Oil and Electricity as a function of the Year.
b) Get an equation for each line.
c) Predict: the percent of homes heating with oil in 1975, heating with electricity in 1990; and heating with oil in 2000.
d) When where the percentages equal?

| Year | Electricity | Oil |
| :---: | :---: | :---: |
| 1950 | 38.5 | $\mathbf{0 . 6}$ |
| 1960 | 32.4 | $\mathbf{1 . 8}$ |
| 1970 | 26.0 | 7.7 |
| 1980 | 18.1 | $\mathbf{1 7 . 7}$ |
| 1983 | 14.9 | $\mathbf{1 8 . 5}$ |
| 1985 | $\mathbf{1 4 . 1}$ | $\mathbf{2 0 . 8}$ |
| 1987 | 14.0 | $\mathbf{2 2 . 7}$ |
| 1989 | 13.3 | $\mathbf{2 4 . 6}$ |
| 1991 | $\mathbf{1 2 . 3}$ | $\mathbf{2 5 . 5}$ |

6. FOIL the following:
a) $(2 x-7)(x+4)$
b) $(-x-3)(-x-5)$
c) $(3 x-5)(2 x+7)$
d) $(2 x+9)(11 x-7)$
7. What program did you select for the "TI on the Web" assignment? What was the main idea behind the program? Why did you select this program?
8. Using the data generated by the BALLB program, answer the following, as in the Ball Bounce Investigations. The list are Bounce Number, and Average Height in centimeters.
a) Give a Scatter Plot and best-fit equation for the Bounce vs. the Average Height.
b) Generate the Initial and Final Height lists, and make a Scatter Plot of this data, with the X-Axis being the Initial Height, and the Final Height being the Y-Axis. Give the best-fit equation for this data.
9. Solve the following equations:
a) $x^{2}-13 x+36=0$
b) $x^{2}+25=10 x$
c) $2 x^{2}-5 x-3=0$
d) $x^{2}+49=0$

Find the Intersection for the following sets of equations:
a) $x+y=8$
b) $3 x-y=6$
$x-y=4$
$2 y=6 x-12$

