Math 1210 College Algebra I
Exam One: Sections 1.1, 1.2, R.2 and R.6
Tuesday, February 1, 2011

Name: Version A

1. (2 pts each) For each statement below fill in the blank with the correct answer.

   a. $\dfrac{\sqrt{6.1}}{2.15\times10^{-3}} + \sqrt[3]{54}$ = 1152.53 Round answer to 2 decimal places.

   b. $\left(\dfrac{27}{8}\right)^{-2/3}$ = $\dfrac{4}{9}$ Give an exact answer.

   c. The set of y–values in a relation is called the range .

   d. The domain is the set of x values in a relation.

2. (2 pts each) Simplify the expressions. Assume that all variables are positive. **Write answers with positive rational exponents**. Give exact answers.

   a. $3^{5/6}\cdot 3^{2/3}$ $3^{3/2}$

   b. $\dfrac{-2x^3}{x^{-8}}$ $-2x^{11}$

   c. $\sqrt[3]{x^5}$ $x^{5/3}$

   d. $\left(\dfrac{y^3}{3}\right)^{-2}$ $\dfrac{9}{y^6}$

   e. $49^{-1/2}$ $\dfrac{1}{7}$

   f. $\left(x^4\right)^{3/4}$ x^3

   g. $6x^0$ 6

   h. $\dfrac{x^{4/3}}{x^{3/5}}$ $x^{11/15}$

   i. $4x^{-3}$ $\dfrac{4}{x^3}$

   j. $\dfrac{3x^{-2}}{18x^4}$ $\dfrac{1}{6x^6}$

3. (4 pts each) Simplify the expressions. Assume that all variables are positive. **Write answers with positive rational exponents.**

a. $\left(4x^3\right)\left(3y^2\right)\left(x^{-3}\right)^2\left(y^5\right)$

$= 12x^3y^2x^{-6}y^5$

$= 12x^{-3}y^7$

$= \dfrac{12y^7}{x^3}$

b. $\dfrac{\left(-2xy^{-5}\right)^{-3}}{6x^{-5}y^3}$

$= \dfrac{-2^{-3}x^{-3}y^{15}}{6x^{-5}y^3}$

$= \dfrac{-y^{15}x^5}{2^3(6)x^3y^3}$

$= \dfrac{-x^2y^{12}}{48}$

c. $z^{1/3}\left(z^{2/3} + z^{5/3}\right)$

$= z^{1/3+2/3} + z^{1/3+5/3}$

$= z + z^2$

d. $\dfrac{\sqrt{y}}{\sqrt[3]{27y^9}}$

$= \dfrac{y^{1/2}}{3y^3} = \dfrac{1}{3y^{5/2}}$

e. $x^2\ \sqrt[3]{x^2}$

$= x^2 \cdot x^{2/3} = x^{8/3}$

f. $\left(\dfrac{25s^6}{5r^{-3}s}\right)^2$

$= \left(5s^5r^3\right)^2 = 25s^{10}r^6$

4. (8 pts) Classify each number listed as one or more of the following: natural number, integer, rational number, irrational number, or real number. Put an **X** in the box with the correct classification(s).

	Number	Natural Number	Integer	Rational Number	Irrational Number	Real Number
a.	$-\frac{13}{7}$			X		X
b.	$\sqrt{15}$				X	X
c.	-7		X	X		X
d.	0		X	X		X

5. (2 pts each) For each statement below circle T if the statement is true and F if the statement is false.

   a. T **F** All real numbers are irrational numbers.

   b. T **F** The expressions -3^2 and $(-3)^2$ are equal.

6. (2 pts) Write -2.84×10^8 in standard form.

   -284,000,000

7. (2 pts) Write 0.0000294 in scientific notation.

   2.94×10^{-5}

8. Misty May-Treanor is building a beach volleyball court. The court needs to be 50 feet by 80 feet and filled with sand to a depth of 1.625 feet.

   a. (2 pts) How many cubic feet of sand is needed for the court? $(Volume = Length \times Width \times Height)$

   $50 \times 80 \times 1.625 = 6500 \ ft^3$

   b. (3 pts) A cubic yard of sand weighs approximately 2600 pounds. How many tons of sand are needed for the volleyball court? Round answer to the nearest ton.
   $(1 \text{ yard} = 3 \text{ feet and } 1 \text{ ton} = 2000 \text{ pounds})$

   $$6500\, ft^3 \left(\frac{1 yd}{3 ft}\right)^3 \left(\frac{2600\ lb}{1 yd^3}\right)\left(\frac{1\ ton}{2000\ lb}\right) = 313\ tons$$

9. The height, in inches, and number of rebounds after 17 games of the 5 starting players for BGSU women's basketball team are shown in the table below.

Height	71	72	73	72	66
Rebounds	102	93	87	64	47

   a. (3 pts) Express the data as a relation R.

   $R = \{(71,102),(72,93),(73,87),(72,64),(66,47)\}$

   b. (2 pts) Give the domain of R.

   $Domain = \{66,71,72,73\}$

   c. (2 pts) Give the range of R.

   $Range - \{102,93,87,64,47\}$

10. In 1998 there were 16,836 students enrolled at BGSU. By 2006 the number of students enrolled had increased to18,251.

a. (4pts) What is the percent change in student enrollment between 1998 and 2006? Round answer to the nearest tenth of a percent.

$$\frac{18251-16836}{16836}\times 100\% = 8.4\%$$

b. (2pts) Write a sentence that interprets what the percent you found in part (a) means in context of the problem.

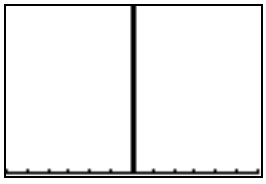
BGSU student enrollment increased 8.4% from 2000 to 2006.

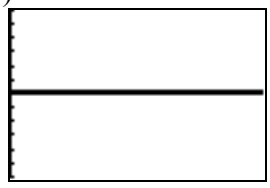
11. Determine the number of tick marks on the positive *x*-axis and the positive *y*-axis for the viewing rectangle $[-6,\ 6,\ 0.5]$ by $[0,\ 100,\ 10]$.

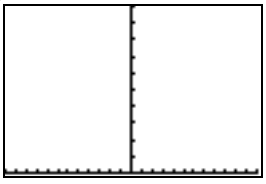
a. (2 pts) Number of tick marks on the positive *x*-axis *12*

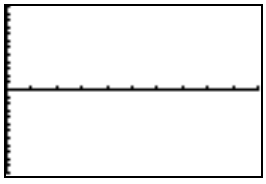
b. (2 pts) Number of tick marks on the positive *y*-axis *10*

c. (2 pts) Which graph represents the viewing rectangle?

A) 

B) 

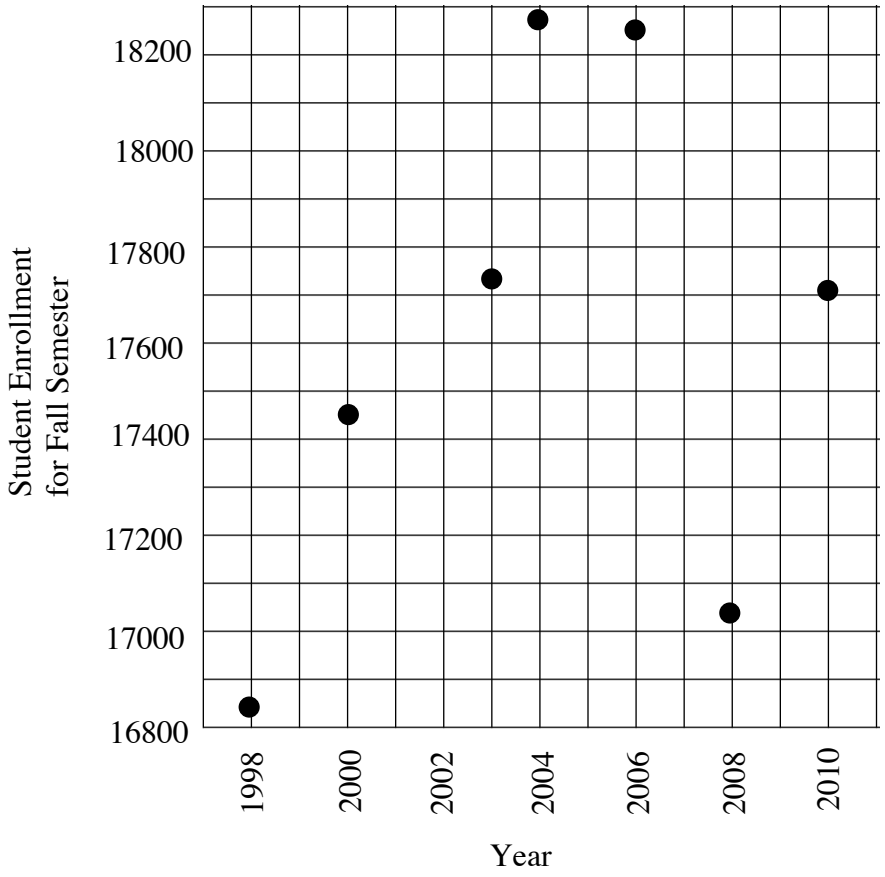
C) 

D) 

12. The table below shows the total students enrolled at Bowling Green State University during fall semester of the given year.

Year (x)	1998	2000	2003	2004	2006	2008	2010
Total Students Enrolled at BGSU During Fall Semester	16,836	17,450	17,738	18,263	18,251	17,033	17,705

a. (6 pts) Make a **scatterplot** by hand, of the data on the grid below. Put year on the x axis and total student enrollment on the y axis. Make sure you use the entire grid; label the axes.



b. (2 pts) Use your calculator to make a scatterplot of the above data. Choose the viewing rectangle below that gives the **best** view on your calculator. Choose only one answer.

Window Setting A	**Window Setting B**	**Window Setting C**	**Window Setting D**	**Window Setting E**
Xmin = 1998	Xmin = 1996.8	Xmin = 1996.8	Xmin = –10	Xmin = 1998
Xmax = 2010	Xmax = 2011.2	Xmax = 2011.2	Xmax = 10	Xmax = 2010
Xscl = 1	Xscl = 1	Xscl = 1	Xscl = 1	Xscl = 1
Ymin = 16836	Ymin = 16593.41	Ymin = 16593.41	Ymin = –10	Ymin = 16836
Ymax = 18263	Ymax = 18505.59	Ymax = 18505.59	Ymax = 10	Ymax = 18263
Yscl = 200	Yscl = 200	Yscl = 1	Yscl = 1	Yscl = 1