

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

Name: Version B

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

a. The range is the set of _____ y _____ values in a relation.

b. The set of x -values in a relation is called the _____ domain _____.

c. $\frac{\sqrt{7.1}}{3.15 \times 10^{-3}} + \sqrt[3]{83} =$ _____ 850.26 _____ Round answer to 2 decimal places.

d. $\left(\frac{27}{64}\right)^{-2/3} =$ _____ $\frac{16}{9}$ _____ Give an exact answer.

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

a. $4^{5/8} \cdot 4^{1/4}$ $4^{7/8}$

b. $\frac{4y^{-3}}{12y^6}$ $\frac{1}{3y^9}$

c. $(y^5)^{2/5}$ y^2

d. $\left(\frac{y^2}{3}\right)^{-3}$ $\frac{27}{y^6}$

e. $7x^0$ 7

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

g. $36^{-1/2}$ $\frac{1}{6}$

h. $\frac{y^{4/5}}{y^{2/3}}$ $y^{2/15}$

i. $2x^{-5}$ $\frac{2}{x^5}$

j. $\frac{-3x^2}{x^{-9}}$ $-3x^{11}$

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

$$\begin{aligned} \text{a. } & (4x^3)(3y^2)(x^4)(y^{-3})^2 \\ & = 12x^3y^2x^4y^{-6} \\ & = 12x^7y^{-4} \\ & = \frac{12x^7}{y^4} \end{aligned}$$

$$\begin{aligned} \text{b. } & \left(\frac{16r^6}{4rs^{-3}}\right)^2 \\ & = (4r^5s^3)^2 = 16r^{10}s^6 \end{aligned}$$

$$\begin{aligned} \text{c. } & y^3 \sqrt[3]{y^2} \\ & = y^3 \cdot y^{2/3} = y^{11/3} \end{aligned}$$

$$\begin{aligned} \text{d. } & r^{2/5}(r^{8/5} + r^{3/5}) \\ & = r^{2/5+8/5} + r^{2/5+3/5} \\ & = r^2 + r \end{aligned}$$

$$\begin{aligned} \text{e. } & \frac{\sqrt{y}}{\sqrt[3]{8y^6}} \\ & = \frac{y^{1/2}}{2y^2} = \frac{1}{2y^{3/2}} \end{aligned}$$

$$\begin{aligned} \text{f. } & \frac{(-3x^{-5}y)^{-3}}{6x^3y^{-5}} \\ & = \frac{-3^{-3}x^{15}y^{-3}}{6x^3y^{-5}} \\ & = \frac{-x^{15}y^5}{3^3(6)x^3y^3} \\ & = \frac{-x^{12}y^2}{162} \end{aligned}$$

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. $\sqrt{12}$				X	X
b. $-\frac{15}{13}$			X		X
c. 0		X	X		X
d. 7	X	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 The expressions $(-4)^2$ and -4^2 are equal.

b. T F All irrational numbers are real numbers.

6. (2 pts) Write -456,000,000 in scientific notation.

$$\boxed{-4.56 \times 10^8}$$

7. (2 pts) Write 1.86×10^7 in standard form.

$$\boxed{18,700,000}$$

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 1.75 feet.

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

$$50 \times 80 \times 1.75 = \boxed{7000 \text{ ft}^3}$$

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 yard = 3 feet and 1 ton = 2000 pounds)

$$7000 \text{ ft}^3 \left(\frac{1 \text{ yd}}{3 \text{ ft}} \right)^3 \left(\frac{2600 \text{ lb}}{1 \text{ yd}^3} \right) \left(\frac{1 \text{ ton}}{2000 \text{ lb}} \right) = \boxed{337 \text{ tons}}$$

9. The height, in inches, and number of rebounds after 19 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	113	102	99	77	50

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

$$R = \{(71,113), (72,102), (73,99), (72,77), (66,50)\}$$

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

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

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

$$\text{Range} = \{113, 102, 99, 77, 50\}$$

10. In 2000 there were 17,450 students enrolled at BGSU. By 2006 the number of students enrolled had increased to 18,251.
- a. (4pts) What is the percent change in student enrollment between 2000 and 2006? Round answer to the nearest tenth of a percent.

$$\frac{18251 - 17450}{17450} \times 100\% = 4.6\%$$

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

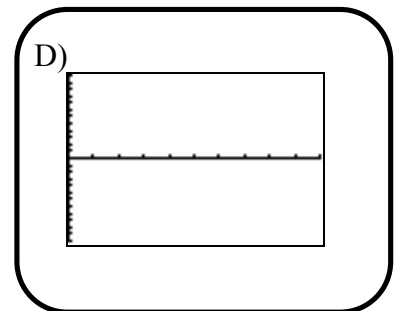
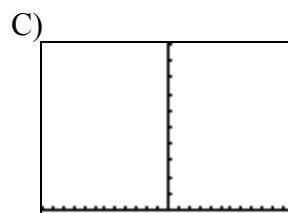
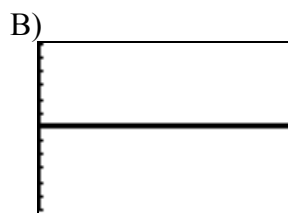
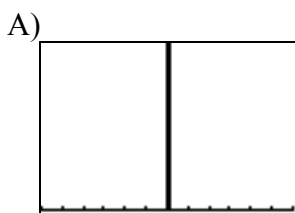
BGSU student enrollment increased 4.6% from 2000 to 2006.

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

- a. (2 pts) Number of tick marks on the positive x -axis 10

- b. (2 pts) Number of tick marks on the positive y -axis 12

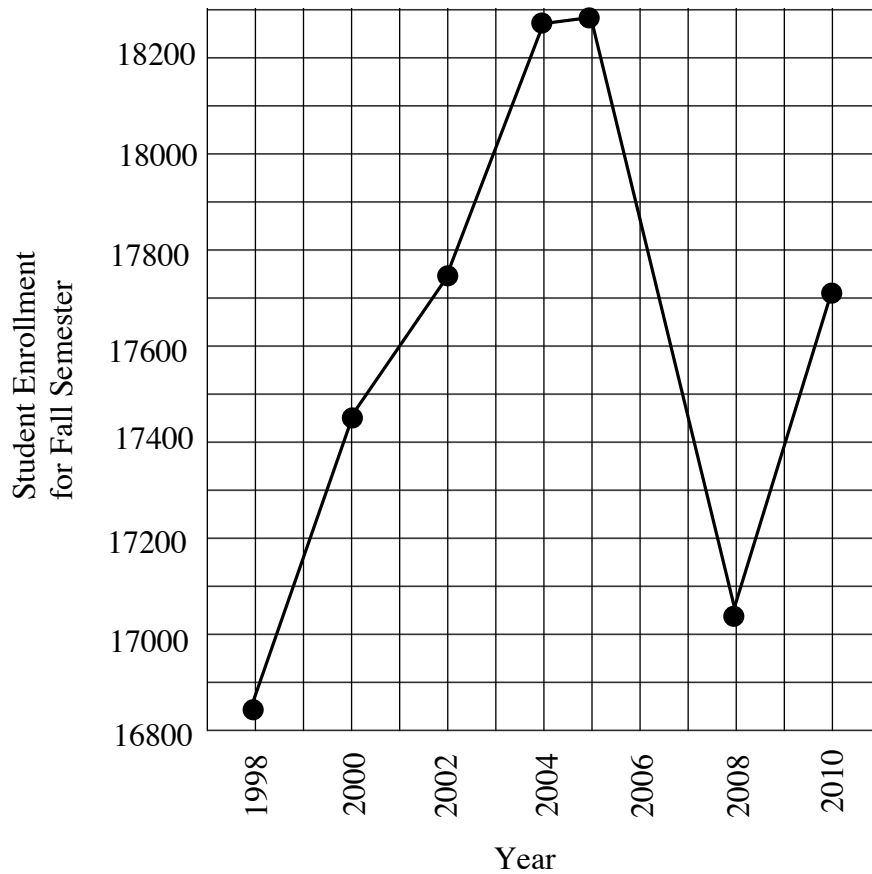
- c. (2 pts) Which graph represents the viewing rectangle?



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	2002	2004	2005	2008	2010
Total Students Enrolled at BGSU During Fall Semester	16,836	17,450	17,741	18,263	18,283	17,033	17,705

- a. (6 pts) Make a **line graph** 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 = 16590.01	Ymin = 16590.01	Ymin = -10	Ymin = 16836
Ymax = 18263	Ymax = 18528.99	Ymax = 18528.99	Ymax = 10	Ymax = 18263
Yscl = 200	Yscl = 1	Yscl = 200	Yscl = 1	Yscl = 1