

DUE September 14, 2006 – If you choose not to turn in these corrections,
you will be given your original exam score for this quiz grade.

Directions: Please read all questions carefully. Answer all parts of each question. Please circle or box your final answers. Show all work and justify all answers for full credit. Partial credit is always given for correct methods, partial correct calculations, and correct justification (rules, theorems, definitions, etc). Point values for each question are indicated in parentheses. Good luck.

- 1) (8pts each) Factor completely over the integers. If the expression is not factorable, state so. You must factor out every monomial except 1 or -1 .

Recall the following factorizations: $a^3 - b^3 = (a - b)(a^2 + ab + b^2)$
 $a^3 + b^3 = (a + b)(a^2 - ab + b^2)$

a. $-8x^2y + 12x^3$

b. $w^2 - 3w - 18$

c. $8x^2 + 18x + 9$

d. $25z^2 - 49$

e. $(3x)^3 - (2x)^3$

f. $t^2 + 16$

g. $8y^3 + 4y^2 - 2y - 1$

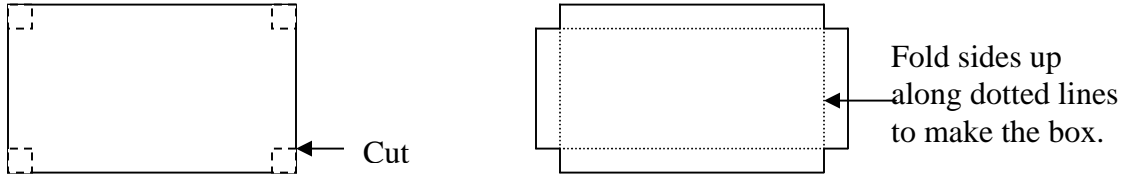
- 2) (9pts) There is a positive integer with the following property: Four times the cube of the number plus 2 is equal to 110. Write an equation that represents this property and find the number by factoring.

- 3) (10pts) Solve by factoring, finding **all** solutions for x.

$$x^4 - 16x^2 + 1 = 9x^2 - 143$$

- 4) (5pts) A rectangular piece of cardboard is 10 inches longer than it is wide. Four squares with 2 inch sides are cut from each corner of the rectangle. The sides of the rectangle are then folded up to make an open box with volume of 112 in^3 .

Find the **length and width of the original piece of cardboard** by writing an equation for the described scenario and solving it by factoring. Recall: $V = \text{length} \cdot \text{width} \cdot \text{height}$.



5) (5pts each) Answer the following questions with an appropriate word, phrase, or mathematical expression.

a. Using the Principle of Zero Products, if $abc = 0$, then we know that

_____.

b. Classify the following statement as **True or False**, and justify your choice with a short explanation:

“The difference of two perfect cubes, $a^3 - b^3$, is **not** factorable.”

c. Classify the following statement as **True or False**, and justify your choice with a short explanation:

“The sum of two perfect squares, $a^2 + b^2$, is **not** factorable.”

d. To check the factorization of a trinomial $ax^2 + bx + c$, you should _____ its binomial factors.

BONUS (+3)

a. Write a quadratic equation that has **two** different solutions (i.e. $x = 1$ and $x = 2$).

b. Write a quadratic equation that has **only one** solution (i.e. $x = 1$ only).

c. Write a quadratic equation that has **no** solution (i.e. no real number solution).