NCLS Math 7 1/08/2012   Name: _____

General Word Problems

1. A picture has a height that is 4/3 its width. It is to be enlarged to have an area of 192 square inches. What will be the dimensions of the enlargement?
2. The product of two consecutive negative integers is 1122. What are the numbers?
3. A garden measuring 12 meters by 16 meters is to have a pedestrian pathway installed all around it, increasing the total area to 285 square meters. What will be the width of the pathway?
4. You have to make a square-bottomed, unlidded box with a height of three inches and a volume of approximately 42 cubic inches. You will be taking a piece of cardboard, cutting three-inch squares from each corner, scoring between the corners, and folding up the edges. What should be the dimensions of the cardboard, to the nearest quarter inch?

Projectile Motion

5. An object in launched directly upward at 64 feet per second (ft/s) from a platform 80 feet high. What will be the object's maximum height? When will it attain this height?
6. An object is launched from ground level directly upward at 64 ft/s. For how long is the object at or above a height of 48 feet?
7. After the semester is over, you discover that the math department has changed textbooks (again) so the bookstore won't buy back your nearly-new book. You and your friend Herman decide to get creative. You go to the roof of a twelve-story building and look over the edge to the reflecting pool 160 feet below. You drop your book over the edge at the same instant that Herman chucks his book straight down at 48 feet per second. By how many seconds does his book beat yours into the water?

Max/Min Problems

8. You have a 500-foot roll of fencing and a large field. You want to construct a rectangular playground area. What are the dimensions of the largest such yard? What is the largest area?
9. You have a 1200-foot roll of fencing and a large field. You want to make two paddocks by splitting a rectangular enclosure in half. What are the dimensions of the largest such enclosure?
10. Your factory produces lemon-scented widgets. You know that each unit is cheaper, the more you produce. But you also know that costs will eventually go up if you make too many widgets, due to the costs of storage of the overstock. The guy in accounting says that your cost for producing x thousands of units a day can be approximated by the formula $C = 0.04x^2 - 8.504x + 25302$. Find the daily production level that will minimize your costs.
11. You run a canoe-rental business on a small river in Ohio. You currently charge $12 per canoe and average 36 rentals a day. An industry journal says that, for every fifty-cent increase in rental price,

the average business can expect to lose two rentals a day. Use this information to attempt to maximize your income. What should you charge?

Solving Right Triangles Using Pythagorean Theorem

Recall that for a right triangle the sum of the squares of the legs is equal to the square of the Hypotenuse.

12. Suppose that one leg of a right triangle is 12 inches while the hypotenuse is $4\sqrt{10}$ inches.. Find the length of the other leg.

13. Suppose that one leg of a right triangle is 1 more than the other leg; and the hypotenuse is 1 less than 2 times the shorter leg. Find the lengths of all the sides.

14. The hypotenuse of a right triangle is 2 cm. more than the longer leg, while the longer leg is itself 2 cm. more than the shorter leg. Find the length of the hypotenuse.

15. A ladder is resting against a wall. The top of the ladder touches the wall at a height of 15 feet. Find the distance from the wall to the bottom of the ladder if the length of the ladder is one foot more than twice its distance from the wall.

Number Problems

Recall that if x is an integer, then the next consecutive integer is x + 1. If x is an even integer, the next consecutive even integer would be x + 2. If x is an odd integer, the next consecutive odd integer would be x + 2 as well.

16. Find two positive consecutive odd integers whose product is 99.

17. The three sides of a right triangle form three consecutive even numbers. Find the lengths of the three sides, measured in inches.

Area Problems

18. The width of a rectangle is 16 feet less than 3 times the length. If the area is 35 square feet, find the dimensions of the rectangle.

19. The width of a rectangle is 15 cm. less than 3 times the length. If the area is 42 square cm. find the dimensions of the rectangle.

20. A plastic box that holds a standard audiocassette has a length 4 cm. longer than its width. The area of the rectangular top of the box is 77 square cm. Find the length and width of the box.