

Name: \_\_\_\_\_

Heatherwood Mathletes  
Heatherwood Math Olympics 2003-2004: Test 3  
March 18, 2004

**A. Mixed Addition, Subtraction, and Multiplication (2 pts each)**

$$\begin{array}{r} 35 \\ + 17 \\ \hline \end{array}$$

$$\begin{array}{r} 65 \\ - 25 \\ \hline \end{array}$$

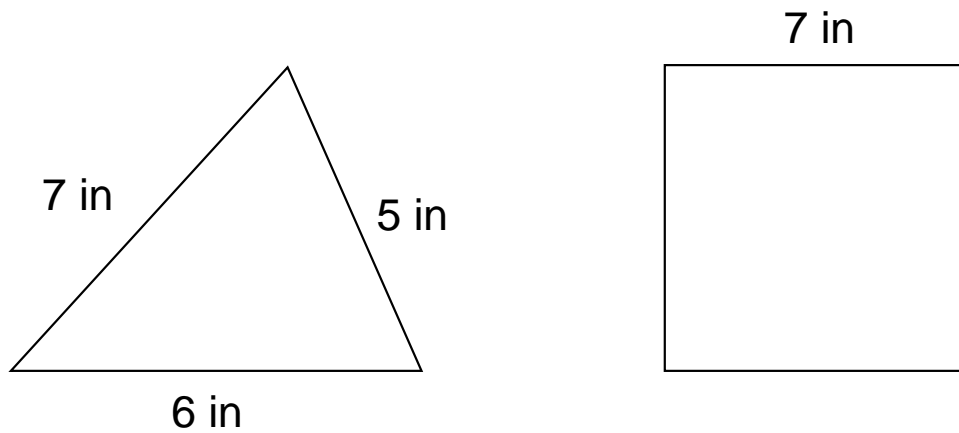
$$\begin{array}{r} 9 \\ \times 8 \\ \hline \end{array}$$

$$\begin{array}{r} 24 \\ \div 4 \\ \hline \end{array}$$

In its first year, a play sells 57 tickets, in its second year it sells 63, and in its third year it sells 22 less than the second year. How many tickets are sold in all three years? (4 pts)

There are eight Christmas trees in the lobby of a hotel. Each has a dozen lights. How many lights are there in all? (4 pts)

**B. Elementary Geometry**



What is the perimeter of the triangle in the figure above? (4 pts)

What is the perimeter of the square in the figure above? (4 pts)

**C. Elementary Adding and Subtracting Fractions (4 pts each)**

$$\frac{1}{3} + \frac{2}{3} =$$

$$\frac{1}{3} - \frac{1}{4} =$$

**D. Elementary Algebra: Solve for  $x$  (3 pts each)**

$$x - 9 = 2$$

$$x + 9 = 10$$

$$\frac{x}{4} = 4$$

**E. Fractions and Decimals (2 pts each)**

**Simplify – write the result as a number**

$$25/4 =$$

$$38/9 =$$

**Solve**

$$1\frac{1}{3} + \frac{2}{3} =$$

$$1\frac{2}{3} - \frac{1}{6} =$$

$$\frac{1}{4} \times \frac{2}{3} =$$

$$3\frac{1}{2} \times \frac{1}{6} =$$

$$\frac{2/5}{1/3} =$$

$$2\frac{1}{2} / \frac{5}{2} =$$

**Write as Fractions**

$$0.2 =$$

$$1.5 =$$

**F. Algebra: Solve for  $x$  (3 pts each)**

$$5x + 2 = 7$$

$$5(x + 1) + 5 = 20$$

$$3(x + 2) + x = 18$$

**G. Word Problems (5 pts each)**

**Problem 1.** Half of the radioactive atoms disappear in 5 minutes. If the original number of atoms is 200, how many atoms will be left after 15 minutes?

**Problem 2.** Eight times a number plus three times that number is the same as 20 more than nine times that number. What is the number?

2a. Write the equation for this problem.

2b. Now solve it for the number.

**Problem 3.** Two consecutive even numbers add to 26. What are the numbers?

3a. Write the equation for this problem.

3b. Now solve it for the two numbers.

**Problem 4.** What is the length of each side of a square if its area is  $64 \text{ in}^2$ ?

**Problem 5.** An equilateral triangle and a square have the same perimeter. If each side of the triangle has a length of 4 in, what is the length of the sides of the square?

**Problem 6.** What is the area of the shaded region that lies between a square whose sides are 2 in and a circle that just fits into the square, as in the following figure?

