<u>Directions:</u> Place your answer to each question below in the answer column.

1) 55×888 ? 88×555.
   a) $<$ b) $>$ c) $=$ (Hint: look at the factors.)

   1) _____

2) $a @ b = \frac{a+b}{a \times b}$ and $a \Delta b = \frac{a \times b}{a+b}$. The value of $a @ b$ is between ½ and 2. The value of $a \Delta b$ is between _____.
   a) 0 and 1   b) 1 and 2   c) 2 and 3   d) ½ and 2   e) 10 and 20

   2) _____

3) Elena is 5" short of being 5' tall. Her height is $\frac{5}{6}$ of her brother Rinaldo's height. Rinaldo is _____ft. _____in. tall.

   3) _____

4) Jeremy purchased a large 60 lb. bag of jelly beans for $96. From these he packaged ½ lb. bags of jelly beans and all were sold for $1.25 each. How much profit did Jeremy make in that business venture?

   4) _____

5) If $n \times 4^2 \times 5^5 = 10^6$, find n.

   5) _____

6) A container is $\frac{4}{5}$ full with red and yellow dye in the ratio of 5:3 (red to yellow). Blue dye is then poured in until the container is full. In simplest form, what is the ratio of blue dye to red dye?

   6) _____

The answer to each question is in parentheses at the beginning of each solution.

1) (c) $55 \times 888 = 5 \times 11 \times 8 \times 111$. $88 \times 555 = 8 \times 11 \times 5 \times 111$. The products are =.

2) (d) $a @ b$ and $a \Delta b$ are reciprocals. Since $a @ b$ lies between 2 and ½, then $a \Delta b$ lies between 2 and ½ or ½ and 2.

3) (5' 6")   5" short of 5' would be 60" - 5" = 55" tall. $\frac{6}{5} \times 55" = 66" = 5' 6"$.

4) ($54)   From the 60 lb. bag he made 120 one-half pound bags. He sold them for $120 \times \$1.25 = \$150$. $\$150 - \$96 = \$54$ profit.

5) (20) $n \times 2 \times 2 \times 2 \times 2 \times 5 \times 5 \times 5 \times 5 \times 5 = 10^6$. Since $2^6 \times 5^6 = (2 \times 5)^6 = 10^6$, n must have two factors of 2 and one factor of 5. $n = 4 \times 5 = 20$.

6) ($\frac{2}{5}$)   If n is the # of full parts, $\frac{4}{5} n = 8$; $n = 10$ parts when full. Add two parts blue dye. The blue to red is now 2:5.