Name: _____
Date: _____
Class: _____

Algebra
Unit 1
HW 1-7

1. Answer the following rate questions based on either multiplication or division. Think carefully about which is required (they will be mixed up). Show the calculation and units that you use.

   (a) A child bought 4 bags of rubber bands to make into bracelets. If there are 80 rubber bands per bag, how many total rubber bands did he buy?

   $80 \cdot 4 = 320$

   (b) Kirk has 42 pieces of candy to divide evenly between his three children. If he puts the pieces into three boxes, how many pieces of candy are there per box?

   $42 \div 3 = 14$

   (c) A car traveling on the Taconic parkway travels 84 miles in two hours. What is the cars speed (a special type of rate) in miles per hour?

   $84 \div 2 = 42$

   (d) A car salesperson earns a $500 fee per car she sells. If she sells 4 cars in one day, how much money does she earn in fees?

   $500 \cdot 4 = \$2000$

2. If there are 4 quarts in a gallon, and 2 pints in a quart, and 2 cups in a pint, then how many cups are in a gallon? Show your calculation or explain how you arrive at your answer.

   $4 \cdot 2 = 8$ pints $\cdot 2 =$ 16 cups

3. A person driving along the road moves at a rate of 56 miles per hour driven. How far does the person drive in 1.5 hours? Show the calculation you use in your answer and give your answer proper units.

   $56 \cdot 1.5 =$ 84 miles

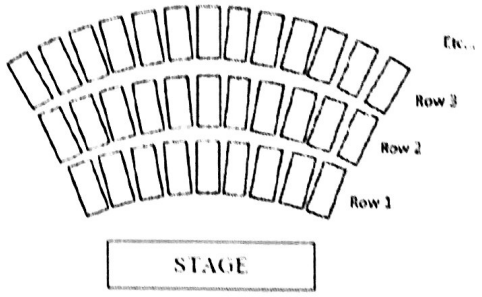
4. Mr. Weiler has 32 students in his class. He wishes to place them into 8 groups of equal size. Which of the following represents the number of students per group?

   (1) 256
   (2) 2
   (3) 6
   (4) 4

   $32 \div 8 = 4$

5. Seating in theaters or auditoriums is often arranged such that rows closer to the stage have less seats than rows farther away. An **example** of a seating chart for a theater is shown below.

(a) Assuming this pattern continues, fill out the following table:



Row, r	Number of Seats, S
1	9
2	11
3	13
4	15
5	17
6	19
7	21

(b) Jonathan tries to mathematically model the number of seats in a given row. He tries to come up with an equation for the number of seats and determines:

$S = 7r + 2$, where S is the number of seats in row, r

Does this equation work for $r = 1$? What about for $r = 2$ and $r = 3$? Show calculations that support your yes/no answers.

$7(1) + 2 = \boxed{9}$ ✓ $\quad 7(3) + 2 = \boxed{23}$ X

$7(2) + 2 = \boxed{16}$ X $\quad$ No

(c) The correct equation is: $S = 2r + 7$. Verify this equation matches your table for $r = 1$, $r = 2$, and $r = 3$.

$2(1) + 7 = 9 \quad 2(2) + 7 = 11 \quad 2(3) + 7 = 13$

(d) According to the formula from part (c), how many seats are in the 15th row? Show your calculation.

$2(15) + 7 = \boxed{37}$

(e) Finally, let's say we know that a certain row has 91 seats in it. Which row is it? Try to set up and solve a simple equation that gives you this answer.

$91 = 2r + 7$

$-7 \quad -7$

$84 = 2r$

$\frac{84}{2} = \frac{2r}{2}$

$\boxed{r = 42}$