Unit 1 - The Building Blocks of Algebra

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RATES, PATTERNS AND PROBLEM SOLVING

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(a) If there are 12 eggs per carton, then how many eggs do we have in 5 cartons?

12 e/c
× 5
60 eggs

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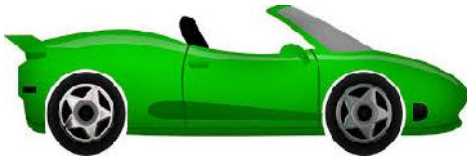
(b) If a car is traveling at 65 miles per hour, then how far does it travel in 2 hours?

65
× 2
130 miles



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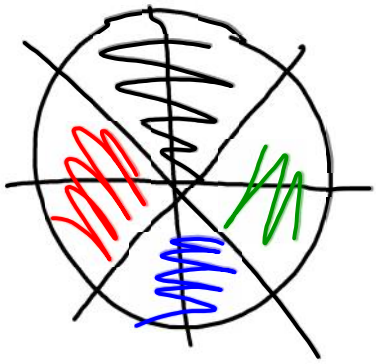
(c) If a pizza contains 8 slices and there are 4 people eating, how many slices are there per person?

$8 \div 4 = 2$



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(d) If a biker travels 20 miles in one hour, how many minutes does it take per mile traveled?

$1 hr = 60 min$

$\frac{20}{1} = \frac{20}{60} = \frac{1 m}{3 min}$

$\frac{20x}{20} = \frac{60}{20}$

$x = 3 min.$

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$\frac{20}{20} = \frac{20}{1} \times \frac{M.\ Inverse}{20}$

$20 + -20 = 0$

$\frac{20x}{20} = \frac{60}{20}$

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Exercise #2: A runner is traveling at a constant rate of 8 meters per second. How long does it take for the runner to travel 100 meters?

(a) Experiment solving this problem by setting up a table to track how far the runner has moved after each second.

time, t (seconds)	Distance, D (meters)
1	8
2 (8)	16
5 (8)	40
10 (8)	80

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(b) Create an equation that gives the distance, D, that the person has run if you know the amount of time, t, they have been running.

$D = rt$ $\quad 6 = 2 \times 3$

(c) Now, set up and solve a simple algebraic equation based on (b), that gives the exact amount of time it takes for the runner to travel 100 meters.

$\frac{100}{8} = \frac{8t}{8}$

$t = 12.5$ seconds

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300

Time (seconds)	Father's Distance (feet)		Daughter's Distance (feet)	Total Distance (feet)
1	9	+	6	15
2	18	+	12	30
5	45	+	30	75
10	90	+	60	150

(b) What must be true about the distances the two have traveled when they meet somewhere in the middle? 180, 120

$f + d = 300$

(c) Create equations similar to Exercise #3 to predict the distance the father has traveled and the distance the daughter has traveled.

$9t + 6t = 300 \rightarrow 15t = 300$

(d) Create and solve an equation to predict the exact amount of time it takes for the father and daughter to meet in the middle.

$\frac{15t}{15} = \frac{300}{15}$ $\quad t = 20$ seconds

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(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
4
320
320 RUBBER BANDS

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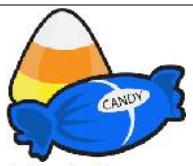

(b) Kirk has 42 pieces of candy to divide evenly between his three children. If he puts the pieces into three boxes, how many pieces of candy are there per box?

14
3|42
3
12
14 pieces / box

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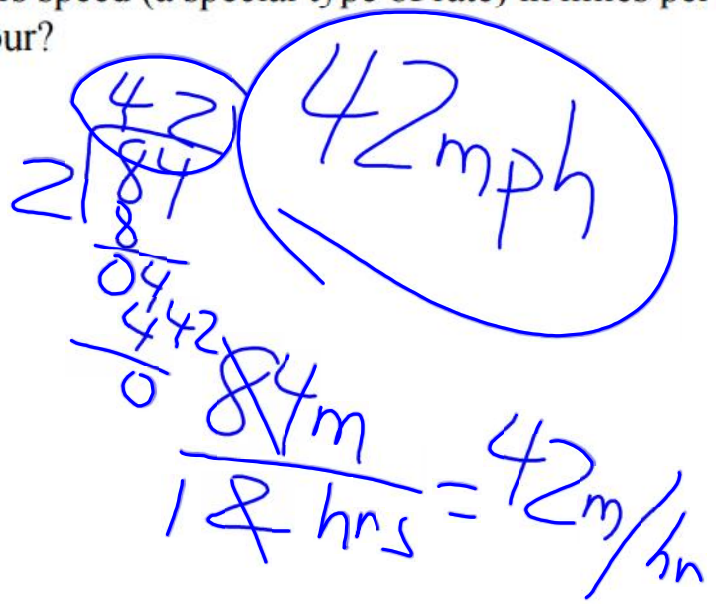
(c) A car traveling on the Taconic parkway travels 84 miles in two hours. What is the cars speed (a special type of rate) in miles per hour?



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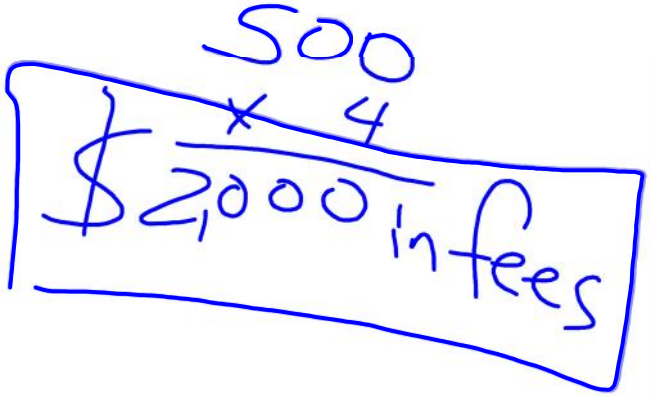
(d) A car salesperson earns a $500 fee per car she sells. If she sells 4 cars in one day, how much money does she earn in fees?



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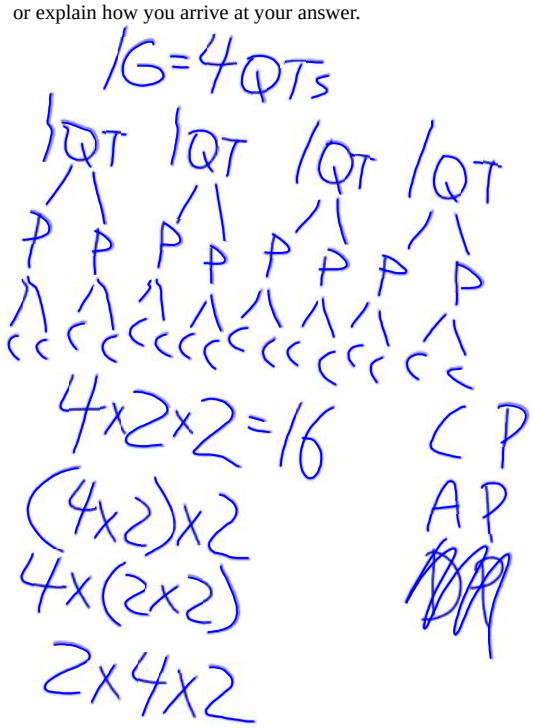
2. If there are 4 quarts in a gallon, and 2 pints in a quart, and 2 cups in a pint, then how many cups are in a gallon? Show your calculation or explain how you arrive at your answer.



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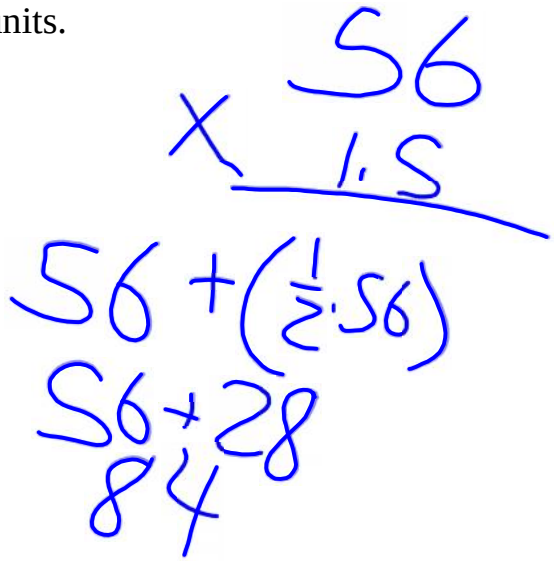
3. A person driving along the road moves at a rate of 56 miles per hour driven. How far does the person drive in 1.5 hours? Show the calculation you use in your answer and give your answer proper units.



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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 (3) 6

(2) 2 (4) 4

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Homework:

Finish the Packet!!

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#15)

a)

r	s
1	9
2	11
3	13
4	15
5	17
6	19
7	21

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$S = 7r + 2$

$9 = 7(1) + 2$

$9 = 7 + 2$

$9 = 9$ ✓

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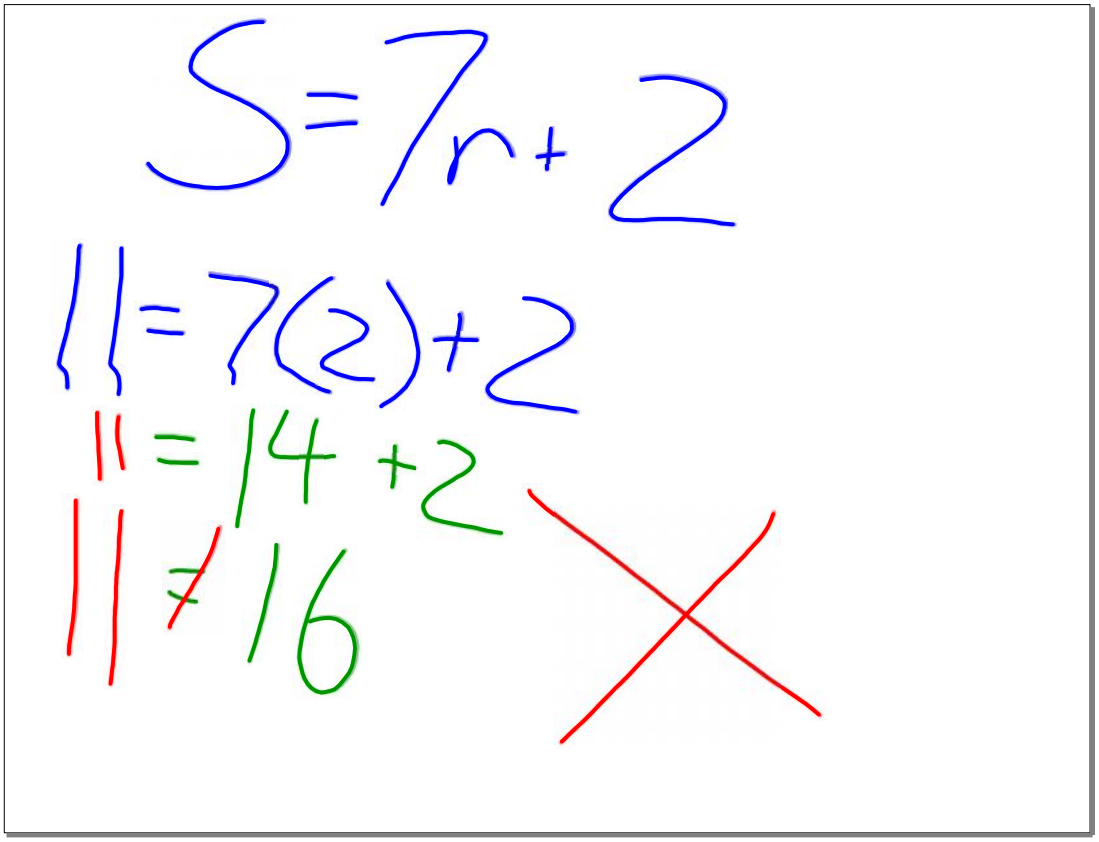

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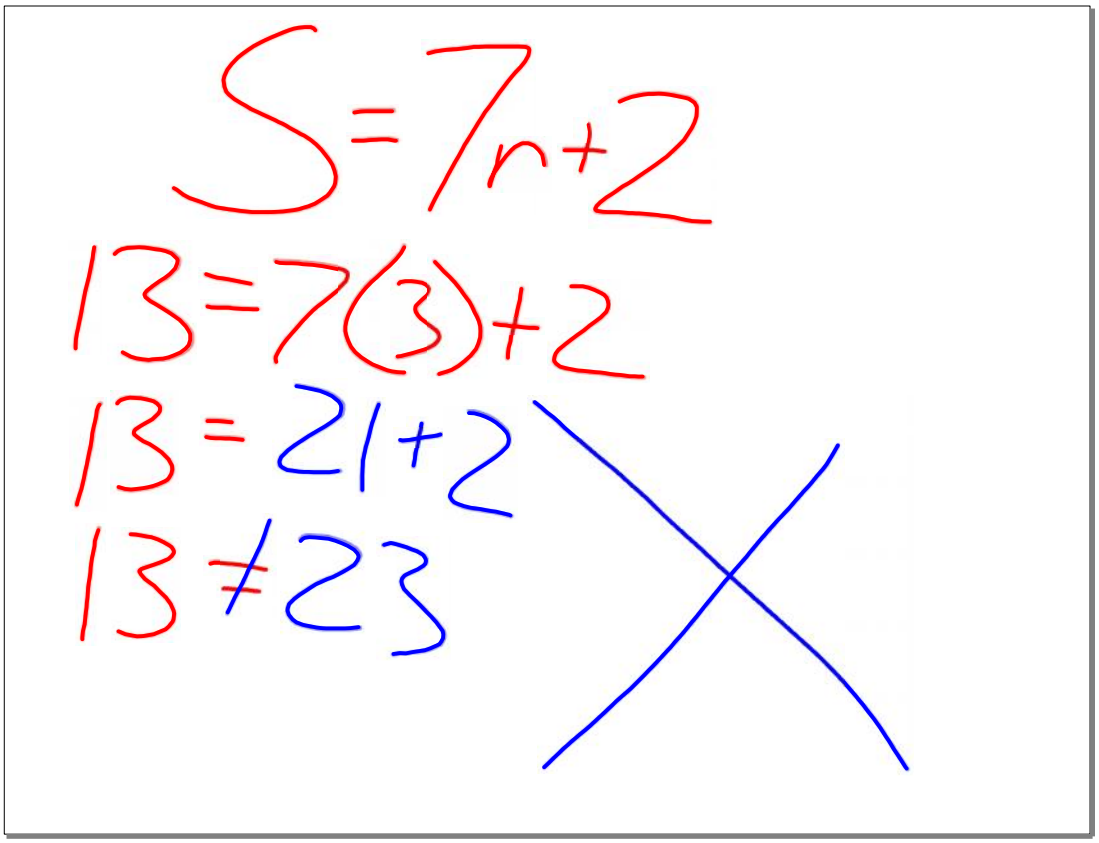

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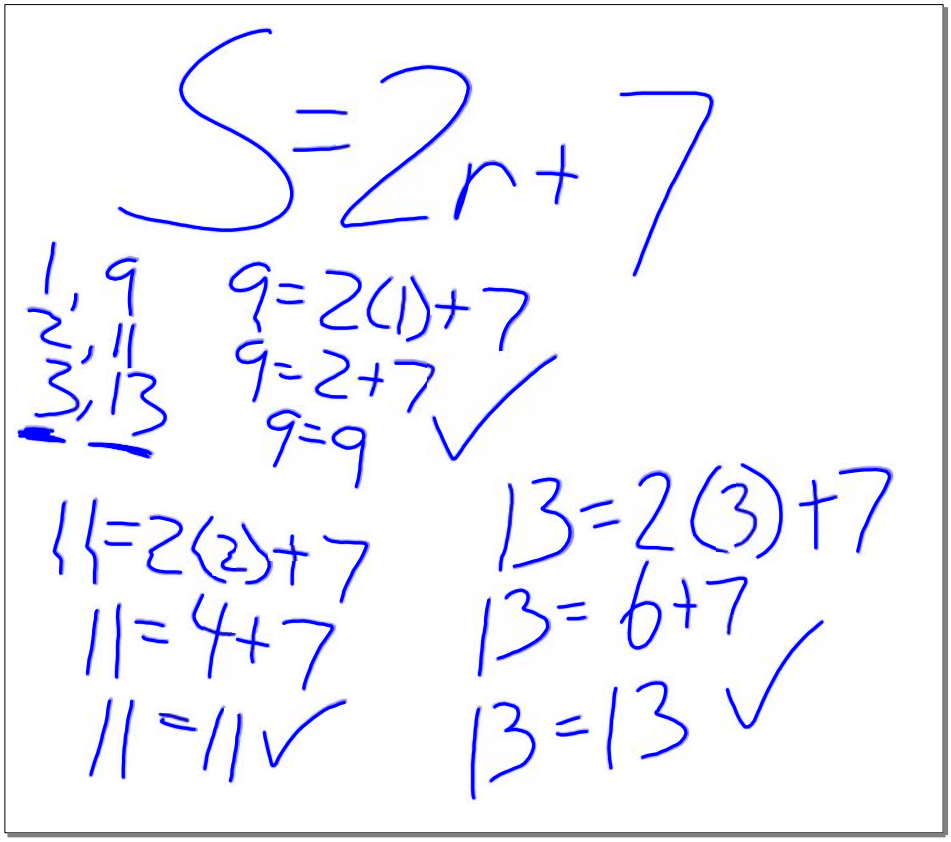

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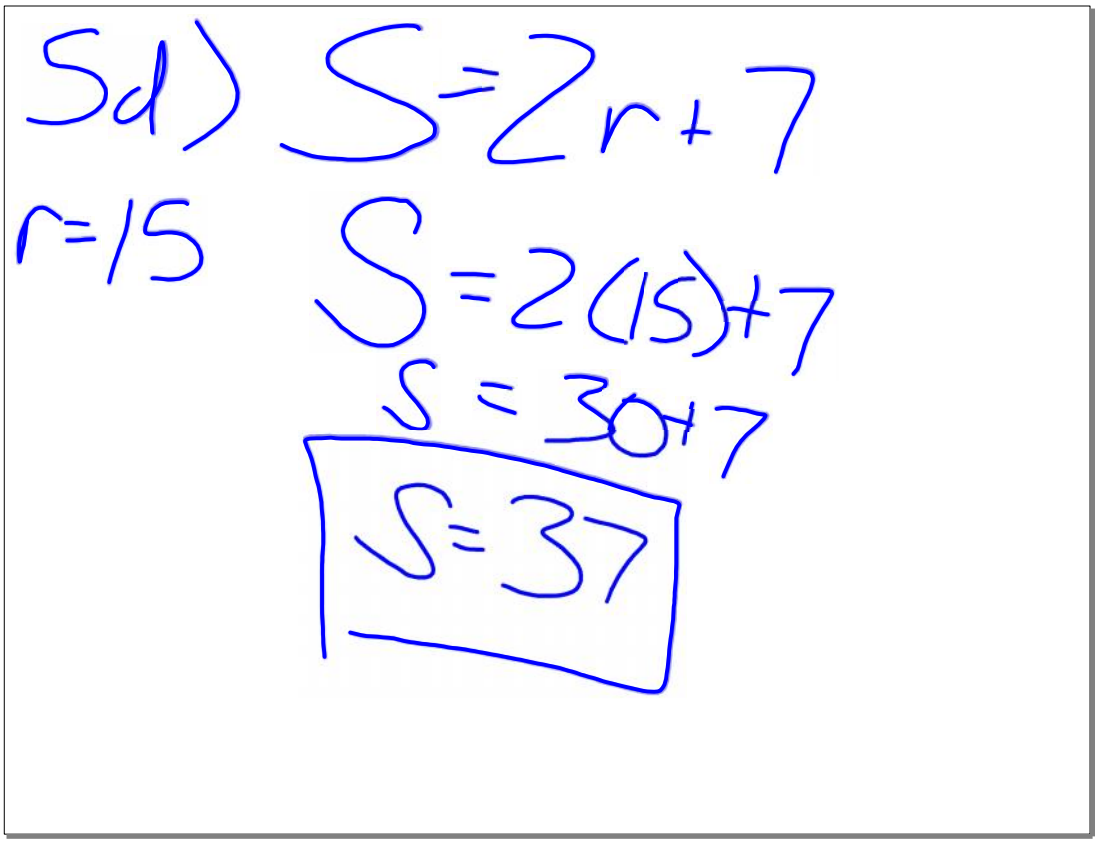

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