Name:_____ Date:_____

Homework sheet: Alg2H   *Equations*

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1. Page 28, questions:

33. $7y - 1 = 23 - 5y$

$$7y + 5y = 23 + 1 \qquad \overset{5y + 1}{}$$

$$12y = 24$$

$$\boxed{y = 2} \quad check: ✓$$

36. $8 - 5x = x - 16$

$$\overset{+5x \; +16}{}$$

$$8 + 16 = x + 5x$$

$$24 = 6x$$

$$\boxed{x = 4} \quad check: ✓$$

2. Page 29, questions:

Which of the following are identities:

55. $3(x - 4) = 3x - 4$

$$3x - 12 \overset{?}{=} 3x - 4$$

$$0 \overset{?}{=} 8 \; X \qquad \overset{-3x \; +12}{}$$

$$False.$$

57. $7(x - 3) \cdot \frac{1}{7} = x - 3$

$$7 \cdot \frac{1}{7}(x-3) = x - 3$$

$$x - 3 = x - 3 ✓$$

$$Identity$$

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3. (Book1 16**) On a road map of Uganda, the scale is $1 : 1, 500, 000$. The distance on the map from Kampala to Ft. Portal is 17 cm. What is the real world distance in km between these two cities?

$$1 \, cm \to 1,500,000 \, cm$$

$$17 \, cm \to 25,500,000 \, cm$$

$$\left.\begin{array}{l} 100 \, cm \to 1m \\ 1000m \to 1km \end{array}\right\} \quad 100,000 \, cm \to 1km \qquad \left.\right\} \; \boxed{255 \, km}$$

Problems denoted with ** mark are taken from Exeter Phillips Academy (NH) math curriculum.

4. (Book1 13**) Pick any number. Add 4 to it and then double your answer. Now subtract 6 from that result and divide your new answer by 2. Write down your answer. Repeat these steps with another number. Continue with a few more numbers, comparing your final answer with your original number. Is there a pattern to your answers?

Picked $2 \rightarrow 2+4=6 \rightarrow 6\times2=12 \rightarrow 12-6=6 \rightarrow \frac{6}{2}=3$
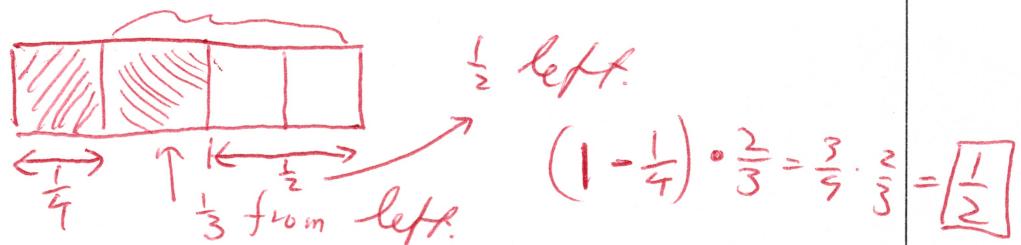
$ 4 \rightarrow 4+4=8 \rightarrow 8\times2=16 \rightarrow 16-6=10 \rightarrow \frac{10}{2}=5$

Pattern: result = pick+1
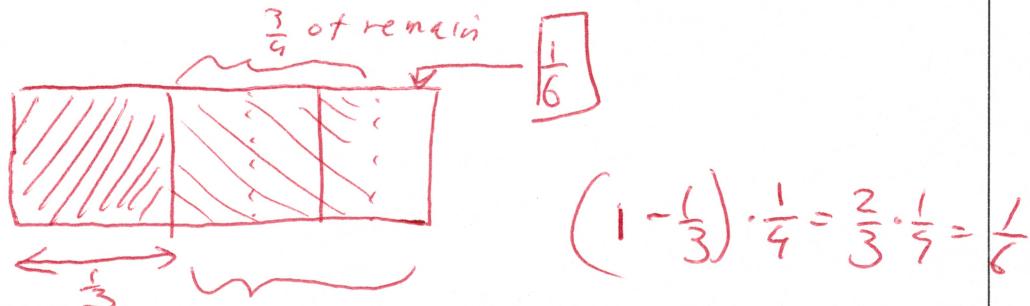
Proof:
$\boxed{x} \rightarrow x+4 \rightarrow 2(x+4)=2x+8 \rightarrow 2x+8-6=2x+2 \rightarrow \frac{2x+2}{2}=\boxed{x+1}$

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5. (Book1 33**) Before you are able to take a bite of your new chocolate bar, a friend comes along and takes 1/4 of the bar. Then another friend comes along and you give this person 1/3 of what you have left. Make a diagram that shows the part of the bar left for you to eat.

$\frac{1}{2}$ left.

$\frac{1}{4}$ $\frac{1}{2}$ $\frac{1}{3}$ from left.

$$\left(1-\frac{1}{4}\right)\cdot\frac{2}{3}=\frac{3}{4}\cdot\frac{2}{3}=\boxed{\frac{1}{2}}$$

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6. (Book1 34**) Later you have another chocolate bar. This time, after you give away 1/3 of the bar, a friend breaks off 3/4 of the remaining piece. What part of the original chocolate bar do you have left? Answer this question by drawing a diagram.

$\frac{3}{4}$ of remain $\frac{1}{6}$

$\frac{1}{3}$

$$\left(1-\frac{1}{3}\right)\cdot\frac{1}{4}=\frac{2}{3}\cdot\frac{1}{4}=\frac{1}{6}$$

remains