NMP Teachers' Post-Test 2014

1. Model the calculation $\frac{2}{3} \div \frac{1}{4}$ with a diagram. Fully explain your diagram.

2. David has a storage unit which costs $100 per month.
(a) The new owners of the storage facility raised the costs by 10%. What is the new cost per month?
(b) During a special sale the cost per month answer from part(a) was reduced by 10%. What is the charge per month now?

3. At the Teruni school of Zen Fractions there are only Math Wizards and Math Geeks. In the Travis class there are 20 students in a ratio of 3 wizards for every geek. In the Jeff class there are 80 students in a ratio of 7 geeks for every wizard. With the student body combined from both classes, what is the ratio of geeks to wizards?

4. Model the calculation $\frac{3}{4} \times \frac{1}{3}$ with a diagram. Be sure to explain your diagram.

5. At the super store Fraction Universe it is possible to rent the "We love Fractions" van for a flat fee of $95 per day plus $0.80 per mile driven.

        (a) Introduce variables and write an expression for the cost to rent the van.

        (b) If you rent the van for 1 week and drive 800 miles, what is the cost of the rental?

6. Explain how you would use Mental Math to solve each of the following. Be sure to actually do what you say and compute the result!

   a) $(78 * 9) + (12 * 9)$

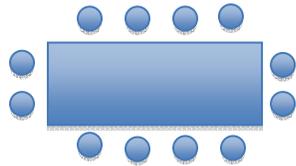   b) $117 - 68$

   c) $70 * 101$

   d) $1 + 6 + 6^2 + 6^3 + 6^4$

   e) $3100 \div 20$

7. OMMITED

8. Tables for a wedding are being set up outside. These each sit 12 people as shown below.

    a) How many people will 3 tables seat if the shorter ends are butted together?

    a) Create an expression for how many people *n* tables connected like the above will seat.

9. Jeff has one-fifth as much money as Peggy. Ed has three times as much money as Peggy. They counted out their money and discovered that all together they have $105. How much money does each person have?

10. Tom and Lucy had both just run out of money when they got to start their summer jobs. For every 7 hours Tom works, he earns $70. Lucy's earnings are listed below.

Lucy's Earnings

Hours worked	Total Earnings
1	15
2	30
3	45
4	60

a) Create expressions for both Tom and Lucy's earnings given how many hours they have worked.
b) If Tom started working 7 hours before Lucy did, how long will it be until they have made the same amount of money? Show this algebraically!