

Spring Quarter Review

June 7, 2012

1. Put the following numbers into binary notation (don't forget to box your 1s and 0s):

(a) $5 =$

(b) $9 =$

(c) $19 =$

(d) $34 =$

2. 18 people were riding on a train. At each train stop, 6 people boarded off the train and 4 new people came on the train. How many people were on the train after 3 stops?

3. Put + and - signs between some of the digits so that you get the correct statement.

$$1 \ 2 \ 3 \ 4 = 5$$

4. Sarah and Tom are twins.

The taller child says, "I am a boy."

The shorter child says, "I am a girl."

If you know that at least one of them is lying, who is taller, Sarah or Tom? (Note that in this case *at least* means one or both.)

Negations!

**What is the correct negation to each of the phrases below?
(Circle one answer for each phrase):**

5. All children like movies.

- (a) Some children like movies.
- (b) Some children don't like movies.
- (c) All children don't like movies.

6. There are more than 5 students in the classroom.

- (a) There are no more than 5 students in the classroom.
- (b) There are less than 5 students in the classroom.
- (c) There are 5 or more students in the classroom.

7. Some balloons are green.

- (a) Some balloons are red.
- (b) All balloons are not green.
- (c) Some balloons are not green.

8. Convert the following numbers from binary notation to the decimal notation:

(a) $\boxed{1} \boxed{1} \boxed{0} =$

(b) $\boxed{1} \boxed{0} \boxed{1} \boxed{0} =$

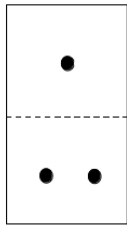
(c) $\boxed{1} \boxed{0} \boxed{1} \boxed{0} \boxed{0} =$

(d) $\boxed{1} \boxed{0} \boxed{1} \boxed{1} \boxed{1} =$

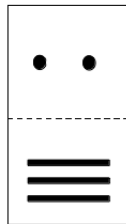
9. Tina has 3 T-shirts and 2 skirts. How many different ways can she select a T-shirt and a skirt to go to school today?

10. Maria lives in a 16 story apartment building. She told her friends that she lives on the 7th floor if you count from the top floor. On what floor does she live if we are counting from the bottom? (The bottom floor is the 1st floor).

11. Put the following Mayan numbers into decimal notaion:



(a)

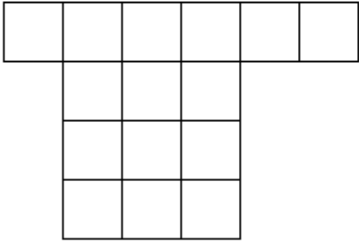


(b)



(c)

12. Cut the shape into 3 shapes that are the same in size and in shape.



13. A grandfather clock chimes the number of times equal to the hour. For example, if it is 3:00 pm, the clock will chime three times.

At 2:00 pm, it takes 5 seconds for the clock to chime.

The chime itself is very quick so that the time is taken by the interval between the chimes.

How long does it take for the clock to chime at 4 p.m.?

14. Add the following binary numbers:

$$\begin{array}{r} \boxed{1} \boxed{1} \boxed{1} \\ + \boxed{1} \boxed{0} \boxed{0} \\ \hline \end{array} \qquad \begin{array}{r} \boxed{1} \boxed{1} \boxed{1} \\ + \boxed{1} \boxed{1} \boxed{0} \\ \hline \end{array}$$

$$\begin{array}{r} \boxed{1} \boxed{0} \boxed{1} \boxed{0} \\ + \boxed{1} \boxed{1} \boxed{1} \boxed{1} \\ \hline \end{array}$$

$$\begin{array}{r} \boxed{1} \boxed{0} \boxed{1} \boxed{1} \boxed{0} \\ + \boxed{1} \boxed{0} \boxed{1} \boxed{1} \boxed{1} \\ \hline \end{array}$$

15. Write down the smallest possible 3 digit number in which all the digits are different. (Remember that a number can not start with a 0)

Write down the largest 3 digit number possible in which all the digits are different.

16. John and Mary are washing dishes. Every minute, John washes twice as many dishes as Mary does. After several minutes, John and Mary washed 9 dishes (working together). How many dishes did Mary wash and how many dishes did John wash?

Mary:

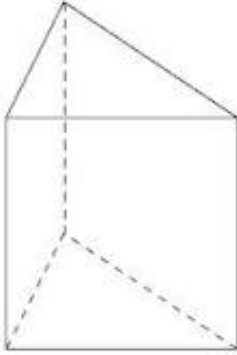
John:

17. One Monday, a dragon has one head. Each day the number of heads doubles. On what day of the week will the dragon have 32 heads?

18. A triangular prism is a 3 dimensional solid (pictured below) such that:

- the top and the bottom faces are equal triangles;
- all 3 side faces are rectangles;

Draw a net that can be folded into a trinagular prism.



19. Subtract the following binary numbers:

$$\begin{array}{r} \\ \\ - \\ \hline \end{array}$$

$$\begin{array}{r} \\ \\ - \\ \hline \end{array}$$

$$\begin{array}{r} \\ \\ - \\ \hline \end{array}$$

$$\begin{array}{r} \\ \\ - \\ \hline \end{array}$$

20. You are given a balance scale. You have 8 coins, and one of them is fake. You know that the fake coin is lighter than the real coins. What is the smallest number of trials you need to use to guarantee that you can identify the fake coin? Describe how you would do it.

21. Jamie and Cathy together have 30 dolls. Jamie has 6 more dolls than Cathy. How many dolls does each girl have?

Jamie:

Cathy:

22. Put the following numbers into Mayan notation:

(a) 25 =



(b) 48 =



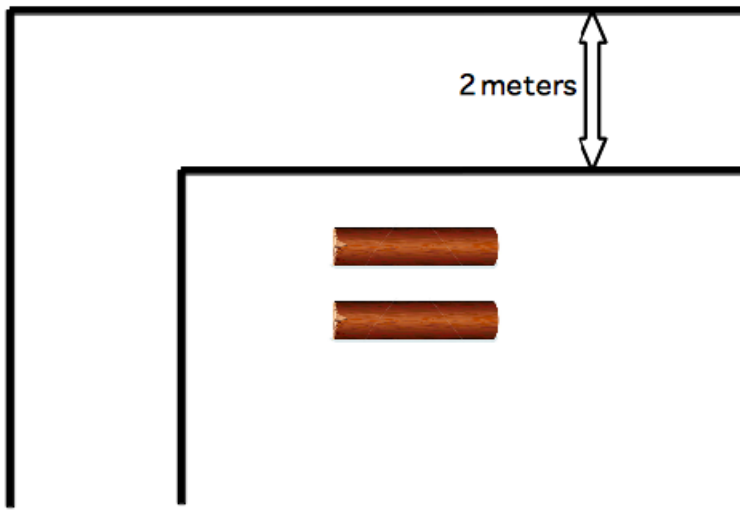
(c) 70 =



(d) 80 =



23. Kate and John need to cross the river in the picture below:



The river is 2 meters wide. The children have 2 logs. Each log is exactly 2 meters long. Can you build a bridge so that they can cross safely? Draw it on the picture.

24. Sudoku:

		4	3		
	3	6			
			5	2	4
2	4	5			
			4	5	
		1	6		