

2004 Washington State Math Championship

Unless a particular problem directs otherwise, give an exact answer or one rounded to the nearest thousandth.

Potpourri - Grade 5

1. A $4 \times 4 \times 4$ cube is painted and then cut into 64 smaller cubes each $1 \times 1 \times 1$. How many of the cubes have paint on exactly one side?

2. What is the value of e in this number square pattern?

1	2	3	4	5	6
2	4	7	11	16	22
3	7	14	25	41	63
4	11	25	50	a	b
5	16	41	a	c	d
6	22	63	b	d	e

3. What time will it be 1111 minutes after 11:11 p.m.?

4. A cell takes half a day to divide, forming two cells. If a cell culture starts with one cell, how many cells will there be after nine days?

5. Lance rides his bike for 20 minutes at 12 miles per hour. Then for an hour and a half he rides at 8 miles per hour, and finally for 24 minutes he rides at 15 miles per hour. How many miles has he traveled?

6. Genetic RNA is one-sided and is composed partially of four bases called Adenosine, Uracil, Guanine, and Cytosine, or A, U, G, and C. In a sequence that is 5 bases long, how many combinations of the four bases are possible?

7. Seven nurses, Ann, Bea, Cara, Dee, Elle, Fran, and Gina have 1 day off each Monday through Sunday week. No two of them have the same day off. Ann's day off is the day after Cara's. Dee's day off is 3 days after the day before Elle's. Bea's day off is 3 days before Gina's. Fran's day off is halfway between Bea's and Cara's and is Thursday. Find Dee's day off.

8. A certain number leaves a remainder of 1 when it is divided by 2, 3, 4, 5, or 6 but leaves no remainder when it is divided by 7. What is the smallest this number can be?

9. Each letter represents a different digit between 0-9. What is the value of $F + P + O$?

$$\begin{array}{r} P O P \\ + \quad O F \\ \hline O P P \end{array}$$

10. A boy agreed to work one year for \$240 and a horse. At the end of seven months, he quit and received \$100 and the horse. What was the value of the horse?