

December 2014 Intermediate Level

1) In the following number series two terms are missing. What is the sum of the two numbers that should be in the blank spaces?

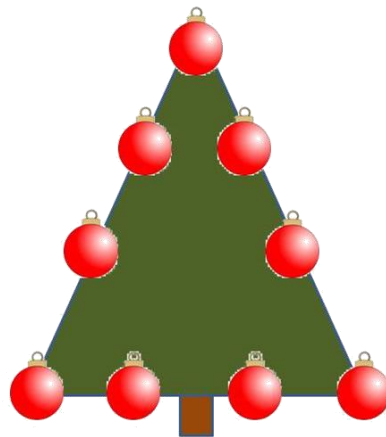
2, 3, 5, 7, 11, __, __, 19

2) Randy has pennies, nickels, and dimes. How many ways can he combine his coins to make 56 cents?

3) Mary gave Mike half of her candy canes. Mike ate $\frac{1}{3}$ of these candy canes and gave the rest to Mel. Mel kept 6 of the candy canes and gave the last 18 to Mark. How many candy canes did Mary have to start with?

4) Santa's eight reindeer decided to race. The races only consisted of two reindeer running against each other at any given time with the others watching. Each reindeer raced each of the other reindeer only once. How many races took place?

5) Using only the digits 1 through 9, place each digit along the three sides of the Christmas tree in the ornaments so that each side adds up to 20. What is the sum of the three numbers on the corners?



6) Bridgette had a square piece of wrapping paper that had an area of 36 cm^2 . She cut out the largest rectangle she could that had a length three times longer than its width. What was the perimeter of this rectangle?

December 2014 Intermediate Level Answers

1) In the following number series two terms are missing. What is the sum of the two numbers that should be in the blank spaces?

2, 3, 5, 7, 11, __, __, 19

30

2) Randy has pennies, nickels, and dimes. How many ways can he combine his coins to make 56 cents?

42

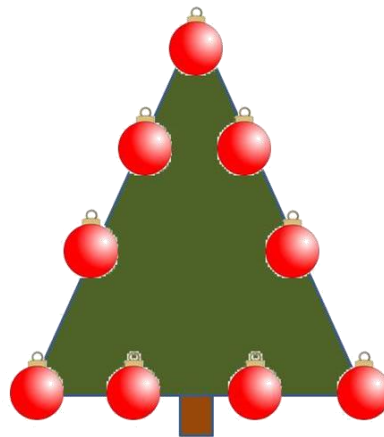
3) Mary gave Mike half of her candy canes. Mike ate $\frac{1}{3}$ of these candy canes and gave the rest to Mel. Mel kept 6 of the candy canes and gave the last 18 to Mark. How many candy canes did Mary have to start with?

72

4) Santa's eight reindeer decided to race. The races only consisted of two reindeer running against each other at any given time with the others watching. Each reindeer raced each of the other reindeer only once. How many races took place?

28

5) Using only the digits 1 through 9, place each digit along the three sides of the Christmas tree in the ornaments so that each side adds up to 20. What is the sum of the three numbers on the corners?



15

6) Bridgette had a square piece of wrapping paper that had an area of 36 cm^2 . She cut out the largest rectangle she could that had a length three times longer than its width. What was the perimeter of this rectangle?

16 cm

December 2014 Intermediate Level Solutions

1) 2, 3, 5, 7, 11, __, __, 19 The sequence is a list of prime numbers and the two missing numbers are 13 and 17. Their sum is 30.

30

2) Make an organized list starting with the most amount of the highest coins and working down. There are 42 ways to make 56¢.

Dimes	Nickels	Pennies		Dimes	Nickels	Pennies		Dimes	Nickels	Pennies
5	1	1		2	5	11		1	1	41
5	0	6		2	4	16		1	0	46
4	3	1		2	3	21		0	11	1
4	2	6		2	2	26		0	10	6
4	1	11		2	1	31		0	9	11
4	0	16		2	0	36		0	8	16
3	5	1		1	9	1		0	7	21
3	4	6		1	8	6		0	6	26
3	3	11		1	7	11		0	5	31
3	2	16		1	6	16		0	4	36
3	1	21		1	5	21		0	3	41
3	0	26		1	4	26		0	2	46
2	7	1		1	3	31		0	1	51
2	6	6		1	2	36		0	0	56

42

3) Work backwards.

Mark has the last 18 and we can add 6 that Mel kept which is 24 candy canes. 24 was $\frac{2}{3}$ of what Mike had, so Mike had 36 and that was $\frac{1}{2}$ of what Mary had to start with. So Mary had 72 candy canes to start with.

Work it forward to check:

$$(72 \div 2 \rightarrow 36) \quad (36 \div 3 \rightarrow 12) \quad (24 - 6 \rightarrow 18)$$

Mary Mike Mike eats 12 Mel Mark

72

December 2014 Intermediate Level Solutions

4) Make a chart to see the pairings.

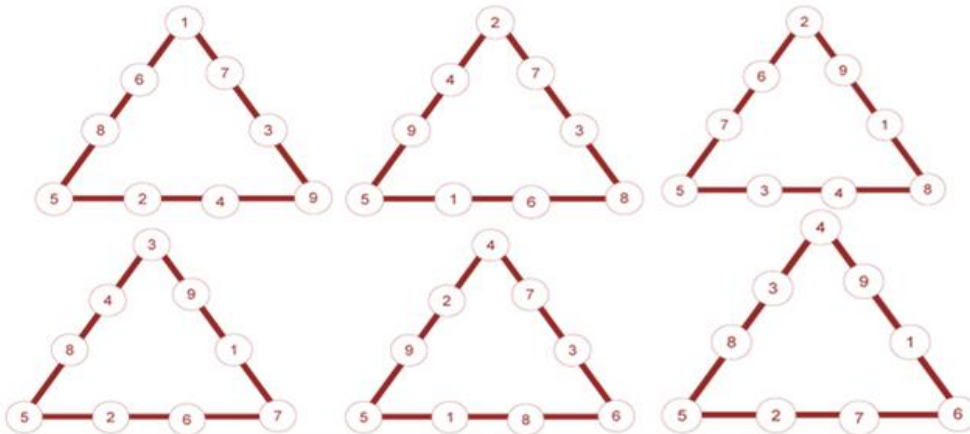
In this combination, there are $7 + 6 + 5 + 4 + 3 + 2 + 1 = 28$ races.

Reindeer 1	Reindeer 2	Reindeer 3	Reindeer 4	Reindeer 5	Reindeer 6	Reindeer 7
Reindeer 2	Reindeer 3	Reindeer 4	Reindeer 5	Reindeer 6	Reindeer 7	Reindeer 8
Reindeer 3	Reindeer 4	Reindeer 5	Reindeer 6	Reindeer 7	Reindeer 8	
Reindeer 4	Reindeer 5	Reindeer 6	Reindeer 7	Reindeer 8		
Reindeer 5	Reindeer 6	Reindeer 7	Reindeer 8			
Reindeer 6	Reindeer 7	Reindeer 8				
Reindeer 7	Reindeer 8					
Reindeer 8						

28

5) There are 6 different arrangements that will yield a sum of 20 on each side.

Regardless to which arrangement you use, the corner sums will always yield 15.


15

6) Area equals length times width. So the dimensions of the square with 36m^2 are: $6\text{m} \times 6\text{m}$. The largest rectangle that could have been cut from this with a length three times the width is $6\text{m} \times 2\text{m}$.

Perimeter is equal to $2L + 2W$.

$$2(6\text{m}) + 2(2\text{m}) = 12 + 4 = 16\text{m}.$$

Therefore, the perimeter of this rectangle is 16cm.

16cm