

St. Joseph's Degree & PG College
Department of Mathematics & Statistics
Math 4 All Solutions to SET-I

- There are one thousand lockers and one thousand students in the school. The principal asks the first student to go to every locker and open it. Then he has the second student go to every second locker and close it. The third goes to every third locker and, if it is closed, he opens it, and if it is open, he closes it. The fourth student does this to every fourth locker, and so on. After the process is completed with the thousandth student, how many lockers are open?

SOLUTION: The only lockers that remain open are perfect squares (1, 4, 9, 16, etc) because they are the only numbers divisible by an odd number of whole numbers; every factor other than the number's square root is paired up with another. Thus, these lockers will be "changed" an odd number of times, which means they will be left open. All the other numbers are divisible by an even number of factors and will consequently end up closed. So the number of open lockers is the number of perfect squares less than or equal to one thousand. These numbers are one squared, two squared, three squared, four squared, and so on, up to thirty one squared. (Thirty two squared is greater than one thousand, and therefore out of range.) So the answer is thirty one.

- Each set of nine numbers relate to each other in a certain way. Work out the logic behind the numbers in the left hand box in order to determine which number is missing

2	9	4
5	16	3
5	11	2

3	7	2
3	28	9
7	?	6

SOLUTION: Each number in the middle column is the product of extremes +1

2	9	4
5	16	3
5	11	2

3	7	2
3	28	9
7	43	6

- Looking at straight lines horizontally, vertically or diagonally, what number is two places away from itself plus 2, three places away from itself multiplied by 2, three places away from itself divided by 2 and three places away from itself minus 2

SOLUTION: 6

11	13	18	1	16
12	10	20	6	19
14	2	5	24	7
40	8	22	26	16
3	9	15	4	32

4. "To err is human and to forgive is divine" is coded as 4 5 4 7 5 4 9 4 8 then

"Help thyself God will help thee" can be coded as -----

SOLUTION: Each word is coded as the number of letters +2

Ex. The word 'to' has two letters , so it is coded as $2+2=4$, err= $3+2=5$ and so on

"Help thyself God will help thee" can be coded as ---6 8 5 6 6 6

5. During a Brain Bashers thinking contest, the total number of points scored by the first six players was 103.

- The first player scored half the points of the second player, who in turn scored 6 points fewer than the third player.
- The third player in turn scored two thirds the points of the fourth player.
- The fifth player managed to score the same number of points as the difference between the first and fourth player's points.
- Finally, the sixth player scored 14 fewer than the fifth player.
Can you determine how many points the sixth player managed to score?

SOLUTION: 9 points.

Respectively the scores were 7, 14, 20, 30, 23, 9.

If the six players are A, B, C, D, E and F we know that:

$$A + B + C + D + E + F = 103 \quad [1]$$

and

$$A = B \div 2$$

$$B = C - 6$$

$$C = D \times 2 \div 3$$

$$E = D - A$$

$$F = E - 14$$

Since D is the letter we're missing information for, it's best to find all of the other letters in terms of D. These steps are left as an exercise, but the result is:

$$A = (2D - 18) \div 6$$

$$B = (2D - 18) \div 3$$

$$C = 2D \div 3$$

$$E = (2D + 9) \div 3$$

$$F = (2D - 33) \div 3$$

We can then use these all in [1] to find that $D = 30$. Which allows us to find $F = 9$.

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Mathematics & Statistics Club

Math 4 All SET-II

1. There are 70 clerks working with Messers STEVE & Co , of which females. Also
 - 30 clerks are married
 - 24 clerks are above 25 years of age
 - 19 married clerks are above years, of which 7 are males
 - 12 males are above 25 years of age
 - 15 males are married

How many bachelor girls are there and how many of these are above 25?

2. Which letter is immediately to the left of the letter which is immediately below the letter which is two to the left of the letter N?

A	B	C	D	E	
F	G	H	I	J	
K	L	M	N	O	
P	Q	R	S	T	
U	V	W	X	Y	Z

3. What number comes inside the circle

What number comes inside the circle?



4. 38629 is to 12
And 14637 is to 11
And 79652 is to 21
Therefore 52968 is to ?
5. A man is trapped in a room. The room has only two possible exits: two doors. Through the first door there is a room constructed from magnifying glass. The blazing hot sun instantly fries anything or anyone that enters. Through the second door there is a fire-breathing dragon. How does the man escape?