Problems on number Questions for SSC Exams.

Problems on number Quiz 3

Directions: Kindly study the following Questions carefully and choose the right answer:

1. The least number by which 1470 must be divided to get a number which is a perfect square is

A. 5 B. 6 C. 15 D. 30

2. Of three numbers, the sum of the first two is 45, the sum of the second and the third is 55, and the sum of the third and thrice the first is 90. Find the third number.

A. 20 B. 25 C. 30 D. 15

3. A girl finds the average of 6 positive integers, each integers containing two digits. By mistake she interchanges the digit of one number say xy for yx. Due to this the average becomes 1.5 less than the previous one. What was the difference between two digits x and y.

A. 1 B. 2 C. 3 D. 4

4. The sum of the squares of three numbers is 532 and the ratio of the first and the second as also of the second and the third is 3 : 2. Then the first number is

A. 8 B. 12 C. 18 D. 20

5. If the product of two successive positive integers is 7482 then, which is the greater integer?

A. 87 B. 82 C. 84 D. 89

6. The difference between a two-digit number and the number obtained by interchanging the digits is 27. If the digit at ten's place is 60% more than the digit at unit's place, what is the original number?

A. 85 B. 58 C. 75 D. 57

7. The numerator of a fraction is decreased by 25% and the denominator is increased by 250%. If the resultant fraction 6/5, what is the original fraction?

A. $\frac{22}{5}$ B. $\frac{24}{5}$ C. $\frac{27}{6}$ D. $\frac{28}{5}$

8. In a three-digit number the digit at the unit's place is four times the digit at the hundred's place. If the digit at the unit's place and the that at the ten's place are interchanged, the new number so formed is 18 more than the original number. If the digit at the hundred's place is one-third of the digit at the ten's place, what is 50% of the original number?

A. 204 B. 342 C. 268 D. 804

9. A number consists of two digits. If the number formed by interchanging the digits is added to the original number, the resulting number (ie, the sum) must be divisible by

A. 11 B. 9 C. 5 D. 3

10. The sum of two numbers is ten. Their product is twenty. Find the sum of the reciprocals of the two numbers.

A. 1 B. $\frac{3}{5}$ C. $\frac{1}{2}$ D. $\frac{11}{6}$

Correct Answers:

1	2	3	4	5	6	7	8	9	10
D	C	A	C	A	A	D	C	A	A

Explanations:

1. 1470 = 7 × 7 × 6 × 5

To make it a perfect square, it must be divided by 5 × 6 = 30.

Hence, option D is correct.

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2. Let the number be x, y and z.

Then x + y = 45 ....(i) y + z = 55 ....(ii) z + 3x = 90 .... (iii)

Now, from (i)

y = 45 – x

And from (ii) z = 55 – y

∴ z = 55 – (45 – x)

z = 10 + x

Putting the value of z in equn. (iii) , we have

3x + 10 + x = 90

∴ x = 20

y = 45 – 20 = 25 and z = 10 + 20 = 30.

Hence, option C is correct.

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3. No. of observations = 6, Increased average = 1.5, Total increased = 6 × 1.5 = 9

Now, let the unit digit of the number whose digits have been interchanged = x and ten's digit of the number = y

Original number = (10y + x), Number after interchanging the digits = (10x + y)

So, (10x + y) – (10y + x) = 9 OR 9x – 9y = 9

∴ Required difference = x – y = 1.

Smart Trick Method:

For such questions you can refer to the table below

Difference in no. after interchanging the digits	Difference in the digits of the original no.
9 (9 × 1)	1
18 (9 × 2)	2
27 (9 × 3)	3
36 (9 × 4)	4

Hence, option A is correct.

4. Let the three numbers be x, y and z.

$\therefore \quad x^2 + y^2 + z^2 = 532$

$\frac{x}{y} = \frac{3}{2}, \frac{y}{z} = \frac{3}{2}$

$\Rightarrow z = \frac{2y}{3}$ and $y = \frac{2x}{3}$

$\Rightarrow z = \frac{4}{9}x$ and $y = \frac{2x}{3}$

$\therefore \quad x^2 + y^2 + z^2 = 532$

$\Rightarrow x^2 + \frac{4x^2}{9} + \frac{16x^2}{81} = 532$

$\Rightarrow x^2 = 324 \Rightarrow x = 18, \ y = 12, \ z = 8$

Hence, option C is correct.

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5. Method I: Let the two successive positive integers be x and x + 1

Then, $x(x + 1) = 7482$

or, $x^2 + x - 7482 = 0$

or, $x^2 + 87x - 86x - 7482 = 0$

or, $(x + 87)(x - 86) = 0$

or, $x = 86$ (Ignore negative value)

$\therefore \ (x + 1) = 86 + 1 = 87$

Hence, the greater positive integer is 87.

Method II:

Calculate square root of 7482 = 86.49

Therefore, the first no. will be 86 & the larger no. be (86 + 1) = 87

PS: Apply the shortcut method to find square root of 7482.

Hence, option A is correct.

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6. Intuitive approach:

We can straight away eliminate the options in which the digit at ten's place is greater than the digit at the unit's place. Option B and D hence get eliminated.

Taking option A into consideration, we can observe that

8 is 3 more than 5 and 3 is $\left(\frac{3}{5} \times 100\right)$ = 60% of 5

Moreover, difference between 85 and 58 is also 27.

Hence, option A is the correct answer.

7. Let the numerator be x and the denominator be y.

Then, the fraction $= \frac{x}{y}$

$\Rightarrow \frac{(100 - 25)\% \text{ of } x}{(100 + 250)\% \text{ of } y} = \frac{6}{5}$

$\Rightarrow \frac{75\% \text{ of } x}{350\% \text{ of } y} = \frac{6}{5}$

$\Rightarrow \frac{75x}{350y} = \frac{6}{5}$

$\Rightarrow \frac{3x}{14y} = \frac{6}{5}$

$\therefore \frac{x}{y} = \frac{28}{5}$

Hence, option D is correct.

8. Let the digit at hundred's place be x.
Then unit's digit = 4x and ten's digit = 3x
So, number = 100x + 30x + 4x = 134
Again hundred's digit = x
Ten's digit = 4x and unit's digit = 3x
New number thus formed = 100x + 40x + 3x = 143x
As per the question,
143x – 134x = 18
$\therefore$ x = 2
Original number = 134 × 2 = 268
$\therefore$ 50% of the original no. = 50% of 268 = 134.
Intuitive Approach:
Let's first get the numbers whose 50% will be the respective options.
The numbers will be
A. 204, B. 342, C. 268, D. 804, E. None of these
Now, out of the given options only option C is such a number in which the unit's place is 4 times the digit at the hundred's place.

Besides, if we interchange the digit at the unit's place and that at the ten's place, the newly formed no. 286 is actually 18 more than the previous one: 268.

Hence, option C is correct.

9. Traditional Approach :

Suppose the tens digit is x and units digit is y.

∴ Number = 10x + y ...(i)

When interchanged, then

number = 10y + x ...(ii)

Adding eqs. (i) and (ii)

10x + y + 10y + x

11x + 11y

11(x + y)

So, it divisible by 11.

Intuitive Approach :

Taking 21 (which is a two digit number) and adding 12 (reverse of 21) to 21. We get,

21 + 12 = 33

which is clearly divisible by 11.

Now, taking 34 (which is a two digit number) and adding 43 (reverse of 34) to 34. We get,

34 + 43 = 77

which is also divisible by 11.

Hence, option A is correct.

10. Let the two numbers be x and y.

∴ The sum (x + y) = 10 ...(i)

and, the product xy = 20 ...(ii)

Now, Sum of reciprocals = $\frac{1}{x} + \frac{1}{y}$

$= \frac{x + y}{xy} = \frac{10}{20} = \frac{1}{2}$

Hence, option A is correct.