Quantitative aptitude

1. **The average of __consecutive even numbers is 'a', which is cube of a one-digit prime number. If the smallest number is 20% less than the largest,which pair of the numbers below could be the number needed to fill the**

blank and 'a'?

A-6, 343

B-4, 27
C-5, 125

D-6, 64

Explanation:

Let there are 'y' consecutive even numbers whose average is 'a', where 'a' is such that its cube root is one digit prime number.

Now, let the smallest of these 'y' consecutive even numbers be 'n', then we should have

[n + (n + 2) + (n + 4) + . . . total 'y' terms in that order] / y = a------(i)

Now, we need to look each option and whichever will satisfy the expression (i) would be our choice.

Option (D) can be ignored because 'a = 64' in it is a cube of 4 which is not a prime number.

Option (A) says y = 6 and a = 343, from (i), we have

$$\frac{[n + (n + 2) + (n + 4) + (n + 6) + (n + 8) + (n + 10)]}{6} = 343$$

$6n + 30 = 6 \times 343$

$n = 338$

Now, question also says that the smallest number is 20% less than the largest, let us check if this happens in this case:

smallest number is, n = 338
largest number would be = n + 10 = 348

$$\frac{348 - 338}{348} \times 100 = 2\frac{76}{87}\%$$

So this option is not correct.

Now, we check option (B).

$$\frac{[n + (n + 2) + (n + 4) + (n + 6)]}{4} = 27$$

$4n + 12 = 108$

$n = 24$

Now, question says that the smallest number is 20% less than the largest, let us check if this happens in this case:

smallest number is, n = 24

largest number would be = n + 6 = 30

$$\frac{30 - 24}{30} \times 100 = 20\%$$

So this option is correct.

Similarly, the students can check the only left option to assure that only option (B) is correct.

Hence, option B is correct.

2. **Some amount was deposited in a bank at 3% interest rate for 6 years andan amount twice of previous one was deposited at R% interest rate for 5 years. If the ratio between the SI incurred from first and second scheme is 2 :5, then R would be:**

A-4.50
B-4.25

C-4.00

D-5.00

Explanation:

Let the first amount be Rs. P.

SI at 3% for 6 years would be

$$= \frac{P \times 3 \times 6}{100} = \frac{18P}{100}$$

The second amount should be Rs. 2P.

SI at R% for 5 years would be

$$= \frac{2P \times R \times 5}{_____} = \frac{10PR}{\_\_\_\_\_}$$

100   100

It is given that

$$\frac{18P}{100} : \frac{10PR}{100} = 2:5$$

18 : 10R = 2 : 5

R = 4.5

Hence, option A is correct.

3. **An unknown amount of money was distributed among Raman, Tanay, Vishal and Samarth. If Vishal got 20% more than Tanay and Raman got 25% less than Samarth, then what would be the unknown amount which was given to Vishal and Samarth together, if sum of money Vishal and Raman gotwere Rs. 9000 and the sum of money Tanay and Samarth got was also Rs.**

9000?

A- Rs. 8000

B- Rs. 11000

C- Rs. 7000

D- Rs. 10000

Explanation:

Let Raman got R, Tanay got T, Vishal got V and Samarth got S amount rupees.

Then, $V = (1 + \dfrac{20}{100})\ T = 1.2T$

and $R = (1 - \dfrac{25}{100})\ S = 0.75S$

It is given that

R + V = 9000

1.2T + 0.75S = 9000 --- (i)

It is also given that

T + S = 9000

1.2T + 1.2S = 10800 ------(ii)

subtracting (i) from (ii), we get

0.45S = 1800

S = 4000

Now, since S + T = 9000, we get T = 5000

Similarly, V = 1.2T = 6000 and R = 0.75S = 3000

Total amount with Samarth and Vishal = S + V = 4000 + 6000 = 10000

Hence, option D is correct.

4. **An article was marked above 30% its cost price. Two successive discounts were offered during its sale in the market so that a profit of Rs. 53 was made. What was the cost price if both the successive discounts were equal to 10%?**

A-1000

B-1200

C-1500

D-1800

Explanation:
Let the cost price be Rs. C.

Then the marked price would be $(1 + \dfrac{30}{100})$ C = 1.3C

The successive discounts were 10%, so selling price would be 90%of 90% of 1.3C = 81% of 1.3C = 1.053C.

Profit = 53 = 1.053C – C = 0.053C

Thus, C = 1000.

Hence, option A is correct.

5. **Two villages Ramnagar and Jamnagar had same population 2 years ago. Population of Ramnagar decreased at R% p.a. while population of Jamnagarincreased at R% p.a. Today, the difference between their population is 1000R, then what was the population of any village 2 years ago?**

A-15000

B-20000

C-25000

D- None of these

Explanation:

Let the population 2 years ago was P. Then, Jamnagar has population after one year

$$= P + R\% \text{ of } P = P(1 + R\%) = P\left(1 + \frac{R}{100}\right)$$

After 2 years, the Jamnagar's population

$$= P\left(1 + \frac{R}{100}\right) + R\% \text{ of } P\left(1 + \frac{R}{100}\right) = P\left(1 + \frac{R}{100}\right)(1 + R\%)$$

$$= P\left(1 + \frac{R}{100}\right) + \left(1 + \frac{R}{100}\right) = P\left(1 + \frac{R}{100}\right)^2$$

Similarly, population of Ramnagar after 2 years would be

$$= P\left(1 - \frac{R}{100}\right)^2$$

Difference between the population

$$= P\left(1 + \frac{R}{100}\right)^2 - P\left(1 - \frac{R}{100}\right)^2 = P\left[\left(1 + \frac{R}{100}\right)^2 - P\left(1 - \frac{R}{100}\right)^2\right]$$

$$= P\left[1 + \left(\frac{R}{100}\right)^2 + \frac{2R}{100} - 1 - \left(\frac{R}{100}\right)^2 + \frac{2R}{100}\right]$$

$$= P \left[\frac{2R}{100} + \frac{2R}{100}\right] = \frac{4PR}{100}$$

The difference between the population is 1000R, thus

$$\frac{4PR}{100} = 1000R$$

P = 25000

Hence, option C is correct.

6. **To fill a water tank one needs to pour 32 buckets of water. A kid wants tofill the tank but he can lift the bucket if it is filled (4/n)th portion. If the kid poured 72 times to fill the water tank completely, what could be the possiblevalue of n?**

A-7

B-9

C-5

D-8

Explanation:

Let the volume of the bucket be 'U' litres, then 32U litres would be the volume of the water tank. Now, the kid, each time fills the bucket to 4U/n litres and to fill the water tank he poured 72 such buckets.

Thus, $72 \times \frac{4U}{n} = 32U$

n = 9

Hence, option B is correct.

7. **A bag contain 5 black and 3 red balls. Two balls are drawn at random.What is the probability of getting both balls of different colours?**

A-11/28

B-13/28

C-15/28

D-17/28

Explanation:
First we will find out the probability of getting both balls of same colours.

In that case, either both the balls would be black or red.

When both the balls are black, probability

$$= \frac{5C2}{8C2} = \frac{5}{14}$$

When both the balls are red, probability

$$= \frac{3C2}{8C2} = \frac{3}{28}$$

Total probability $= \dfrac{5}{14} + \dfrac{3}{28} = \dfrac{13}{28}$

Probability of getting both balls of different colours = 1 – probability of getting

both balls of same colour

$$= 1 - \frac{13}{28} = \frac{15}{28}$$

Hence, option C is correct.

8. **Perimeter of a right-angled triangle is 60 cm. If one side of it is 10 cm andthe area is 120 cm² then what could be the length of hypotenuse of the triangle?**

A-24

B-26

C-28

D-30

Explanation:

Let the three sides be h = hypotenuse, b = base and y = height.

We need to check all the possible cases for what could be the length of hypotenuse.

It is well known that in a right angled triangle, hypotenuse is always greater than base and height.

Thus, we have h > b and y.

Now if one side is 10cm, it could be anything h, y, or b.

But if we assume h =10cm, then y and b individually cannot be equal to or greater than 10cm. Means,

if h = 10 cm, then y < 10 cm and b < 10 cm, and in this way y+b < 20 cm. And we have then h + y + b < 30cm. But perimeter is 60 cm, so the hypotenuse cannot be 10cm.

Now we have two more choices left, but since there is no distinction the question make about the relative length of base and height, we can assume 10 cm to be either base or height.

so, let us assume that b = 10 cm.

Then,

h + 10 + y = 60

h + y = 50

$$Area = 120 = \frac{1}{2} \times 10 \times y$$

y = 24 cm

h = 50 −24 = 26 cm.

So, if we assume base = 10 cm, the hypotenuse is 26 cm.

Let us verify it if it true according to the Pythagoras Theorem.

We should have b2 + y2 = h2

10 × 10 + 24 × 24 = 26 × 26

100 + 576 = 676

Right hand side = Left hand side.

Hence, option B is correct.

9. The age of father 10 years ago was 200% more than the age of his son. Ifthe ratio of present age of son and father is 3:7, then

A- ratio of ages 25 years ago was 1:9.

B- age of father 5 years hence will be 75.

C- age of son 5 years ago was 25.
D- All of the options above are true.

Explanation:

Let the present age of father be F and that of son be S.

Then, S : F = 3 : 7------(i)

Thus, S = 3F/7

10 years ago, F – 10

$$= (1 + \frac{200}{100})(S - 10) = 3(S - 10) ---- (ii)$$

From (i) and (ii), we get

$$F - 10 = 3 \left(\frac{3F}{7} - 10 \right)$$

$$F - 10 = \frac{9F}{7} - 30$$

$$F - \frac{9F}{7} = -20$$

F = 70

Similarly, we get S = $\dfrac{3F}{7}$ = 30

First option asks ratio of ages 25 years ago

30 −25 = 5

70 − 25 = 45

5 : 45 = 1 : 9

Thus option (A) is correct.

Second option asks age of father 5 years hence

70 + 5 = 75

This option is also correct.

Third option asks age of son 5 years ago

30 − 5 = 25

This option is also correct.

Hence, option D is correct.

10. Raman started a business with Rs. 10000 and after a few months he wasjoined by his friend Aman. The profit at the end of the year was

divided between Raman and Aman in the ratio 4 : 3, and profit received by Raman is

30% of his investment. For how many months did Aman invest his money if he had invested five times of what he got from the profit at the end of year?

A-4

B-6

C-8

D-10

Explanation:

Profit distribution between Raman and Aman is 4 : 3, and Raman got 30% of 10000 = 3000,

thus Aman got $\dfrac{3}{4}$ × 3000 = Rs. 2250.

So Aman invested 5 × 2250 = Rs. 11250.

Let Aman invested Rs. 11250 for 'y' months. Then

12 × 10000 : 11250y = 4 : 3

y = 8.

Thus, Aman invested for 8 months.

Hence, option C is correct.