

2. $16a^2$

3. $\frac{8}{a^2}$

4. 8

Q.2 ABCD is a cyclic quadrilateral whose diagonals intersect at P. If $AB = BC$, $\angle DBC = 70^\circ$ and $\angle BAC = 30^\circ$, then the measure of $\angle PCD$ is:

Ans 1. 30°

2. 55°

3. 50°

4. 35°

Q.3 $\frac{\sin\theta - \cos\theta + 1}{\sin\theta + \cos\theta - 1} = ?$

Ans 1. $\sec\theta + \tan\theta$

2. $\sec\theta - \tan\theta$

3. $\sec\theta \tan\theta$

4. $\sec\theta \sin\theta$

Q.4 The table shows the production of different types of cars by a company (in thousands) in 5 years.

Car	A	B	C	D	E
2014	52	54	48	46	64
2015	47	45	53	50	45
2016	48	47	56	54	65
2017	43	50	57	67	63
2018	38	40	54	68	70

The total production of type B cars in all the five years is what percent more than the total production of type A, B and D cars in 2017?

Ans 1. 49.5

2. 32.2

3. 57.3

4. 47.5

Q.5 A and B are travelling towards each other from the points P and Q respectively. After crossing each other, A and B take $6\frac{1}{8}$ hours and 8 hours, respectively, to reach their destinations Q and P, respectively. If the speed of B is 16.8 km/h, then the speed (in km/h) of A is:

- Ans 1. 19.2
 2. 20.4
 3. 19.8
 4. 20.8

Q.6 ABCD is a trapezium in which $AB \parallel DC$ and its diagonals intersect at P. If $AP = (3x-1)$ cm, $PC = (5x-3)$ cm, $BP = (2x+1)$ cm and $PD = (6x-5)$ cm, then the length of DB is:

- Ans 1. 10 cm
 2. 16 cm
 3. 14 cm
 4. 12 cm

Q.7 The table shows the production of different types of cars by a company (in thousands) in 5 years.

Car \ Year	A	B	C	D	E
2014	52	54	48	46	64
2015	47	45	53	50	45
2016	48	47	56	54	65
2017	43	50	57	67	63
2018	38	40	54	68	70

What is the ratio of the total production of type C cars in 2015 and type D cars in 2017 taken together to the total production of type B cars in 2016 and type A cars in 2017 taken together?

- Ans 1. 13 : 10
 2. 12 : 11
 3. 11 : 9
 4. 4 : 3

Q.8 The income of A is 50% more than that of B. If the income of A is increased by 40% and the income of B is increased by 90%, then the percentage increase in their combined income will be:

- Ans 1. 70
 2. 55
 3. 60
 4. 64

Q.9 If $12 \cot^2 \theta - 31 \operatorname{cosec} \theta + 32 = 0$, $0^\circ < \theta < 90^\circ$, then the values of $\tan \theta$ will be:

Ans

1. $\frac{5}{4}, \frac{4}{3}$

2. $\frac{4}{3}, \frac{3\sqrt{7}}{7}$

3. $\frac{4}{5}, \frac{5\sqrt{7}}{7}$

4. $\frac{4}{5}, \frac{4}{3}$

Q.10 The value of $\sqrt{\sec^2\theta + \operatorname{cosec}^2\theta} \times \sqrt{\tan^2\theta - \sin^2\theta}$ is equal to:

Ans 1. $\sin\theta \sec^2\theta$

2. $\operatorname{cosec}\theta \cos^2\theta$

3. $\sin\theta \cos^2\theta$

4. $\operatorname{cosec}\theta \sec^2\theta$

Q.11 A sum of ₹15,000 is lent at 16% p.a. compound interest. What is the difference between the compound interest for the second year and the third year?

Ans 1. ₹548

2. ₹454.88

3. ₹445.44

4. ₹544

Q.12 The average of thirteen numbers is 80. The average of the first five numbers is 74.5 and that of the next five numbers is 82.5. The 11th number is 6 more than the 12th number and the 12th number is 6 less than the 13th number. What is the average of the 11th and the 13th numbers?

Ans 1. 86.5

2. 87.5

3. 87

4. 86

Q.13 A circle is inscribed in $\triangle ABC$, touching AB at P, BC at Q and AC at R. If AR = 5 cm, RC = 6 cm and AB = 12 cm, then the perimeter of $\triangle ABC$ is:

- Ans 1. 36 cm
 2. 37 cm
 3. 40 cm
 4. 32 cm

Q.14 The table shows the production of different types of cars by a company (in thousands) in 5 years.

Year \ Car	A	B	C	D	E
2014	52	54	48	46	64
2015	47	45	53	50	45
2016	48	47	56	54	65
2017	43	50	57	67	63
2018	38	40	54	68	70

The average production of type D cars in 5 years is what percent less than the production of type E cars in 2018?
 (Correct to one decimal place)

- Ans 1. 16.8
 2. 18.6
 3. 17.4
 4. 15.9

Q.15 If $ab + bc + ca = 8$ and $a^2 + b^2 + c^2 = 20$, then a possible value of

$$\frac{1}{2}(a + b + c)[(a - b)^2 + (b - c)^2 + (c - a)^2]$$
 is:

- Ans 1. 84
 2. 72
 3. 56
 4. 80

Q.16 A person sold an article at a loss of 8%. Had he sold it at a gain of 10.5%, he would have received ₹92.50 more. To gain 12%, he should have sold it for:

- Ans 1. ₹540.50
 2. ₹560
 3. ₹537.40
 4. ₹580

Q.17 If the 8-digit number $2074x4y2$ is divisible by 88, then the value of $(4x + 3y)$ is:

- Ans
- 1. 42
 - 2. 36
 - 3. 45
 - 4. 49

Q.18 Pipes A and B can fill a tank in one hour and two hours respectively while pipe C can empty the filled up tank in one hour and fifteen minutes. A and C are turned on together at 9 a.m. After 2 hours, only A is closed and B is turned on. When will the tank be emptied?

- Ans
- 1. 11:30 a.m.
 - 2. 10:30 a.m.
 - 3. 12:20 p.m.
 - 4. 12:10 p.m.

Q.19 A shopkeeper marks his goods at 40% more than their cost price and allows a discount of 25% on the marked price. His gain or loss percent is:


- Ans
- 1. 5% loss
 - 2. 10% loss
 - 3. 5% gain
 - 4. 15% gain

Q.20 The volume of a metallic cylindrical pipe is 7480 cm^3 . If its length is 1.4 m and its external radius is 9 cm, then its thickness (given $\pi = \frac{22}{7}$) is:

- Ans
- 1. 1.2 cm
 - 2. 0.8 cm
 - 3. 0.9 cm
 - 4. 1 cm

Q.21 The value of $(5 + 3 \div 5 \times 5) \div (3 \div 3 \text{ of } 6)$ of $(4 \times 4 \div 4 \text{ of } 4 + 4 \div 4 \times 4)$ is:

- Ans
- 1. $6\frac{2}{3}$
 - 2. $7\frac{1}{3}$

 3. $8\frac{1}{5}$


 4. $9\frac{3}{5}$

Q.22 The table shows the production of different types of cars by a company (in thousands) in 5 years.


Car \ Year	A	B	C	D	E
2014	52	54	48	46	64
2015	47	45	53	50	45
2016	48	47	56	54	65
2017	43	50	57	67	63
2018	38	40	54	68	70

If the data related to the production of cars in 2018 is represented by pie chart, then the central angle of the sector representing the production of type C cars will be:

Ans  1. 91°

 2. 93°

 3. 72°

 4. 59°

Q.23 If $(8x^3 - 27y^3) \div (2x - 3y) = (Ax^2 + Bxy + Cy^2)$, then the value of $(2A + B - C)$ is:

Ans  1. 3

 2. 4


 3. 5

 4. 6

Q.24 When x is subtracted from each of 21, 22, 60 and 64, the numbers so obtained, in this order, are in proportion. What is the mean proportional between $(x + 1)$ and $(7x + 8)$?

Ans  1. 21

 2. 24

 3. 18

 4. 27

Q.25 G is the centroid of the triangle ABC , where AB , BC and CA are 7 cm, 24 cm and 25 cm respectively, then BG is:

Ans  1. $8\frac{1}{3}$ cm

