# Mathematics

## REVISION and MODEL QUESTIONS

**I. Four alternatives are given for each of the following questions/incomplete statements. Only one of them is correct or most appropriate. Choose the correct alternative and write the complete answer along with its alphabet in the space provided against each questions.**

**9) Find the LCM of the following integers by applying the prime factorization method.**
**17, 23 and 29**

a) 1 b) 420
c) 320 d) 824

Ans:- b) 420

**Solution:**

17, 23 and 29
17 = 17
23 = 23
29 = 29

Therefore,
LCM = (12, 15, 21)
= 22 × 3 × 5 × 7
= 420

**10)**

$(\sec^2 A - 1)$ is equal to

(A) $\tan^2 A$ (B) $\cot^2 A$
(C) $\sin^2 A$ (D) $\operatorname{cosec}^2 A$

**Ans:- (A)** $\tan^2 A$

**11) If the perimeter and the area of a circle are numerically equal, then the radius of the circle is**

(a) 2 units (b) π units
(c) 4 units (d) 7 units

Ans:- (A) 2 units

**Solution**:
Since the perimeter of the circle = area of the circle,

$$2\pi r = \pi r^2$$
Or, r = 2

So, option (A) is correct i.e. the radius of the circle is 2 units.

**12)**

7 × 11 × 13 + 13 is a

(A) Prime number (B) Composite number
(C) Irrational number (D) Odd number

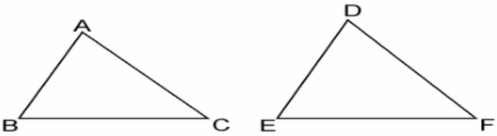
**Ans:-** (B) Composite number

**13) Sides of two similar triangles are in the ratio 4 : 9. Areas of these triangles are in the ratio**

**(a) 2 : 3** **(b) 4 : 9**
**(c) 81 : 16** **(d) 16 : 81**

**Ans;- (D) 16 : 81**

**Solution:** Given, Sides of two similar triangles are in the ratio 4 : 9.



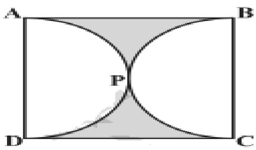

Let ABC and DEF are two similar triangles, such that,
ΔABC ~ ΔDEF
And AB/DE = AC/DF = BC/EF = 4/9
As, the ratio of the areas of these triangles will be equal to the square of the ratio of the corresponding sides,
∴ Area(ΔABC)/Area(ΔDEF) = $AB^2/DE^2$
∴ Area(ΔABC)/Area(ΔDEF) = $(4/9)^2$ = 16/81 = 16:81
Hence, the correct answer is (D).

**II. Answer the following**

**1) The radii of two circles are 19 cm and 9 cm respectively. Find the radius of the circle which has a circumference equal to the sum of the circumferences of the two circles.**

**Solution:**
The radius of the 1st circle = 19 cm (given)
∴Circumference of the 1st circle=2π×19=38π cm
The radius of the 2nd circle = 9 cm (given)
∴ Circumference of the 2nd circle = 2π×9 = 18π cm
So,
The sum of the circumference of two circles =
= 38π+18π
= 56π cm
Now, let the radius of the 3rd circle = R
∴ The circumference of the 3rd circle = 2πR
It is given that sum of the circumference of two circles = circumference of the 3rd circle
Hence, 56π = 2πR Or, R = 28 cm.

**2) Find the area of the shaded region in Fig. if ABCD is a square of side 14 cm and APD and BPC are semicircles.**




**Solution:**Side of the square ABCD (as given) = 14 cm
So, Area of ABCD = $a^2$
= 14×14 $cm^2$ = 196 $cm^2$
We know that the side of the square = diameter of the circle = 14 cm
So,
side of the square = diameter of the semicircle=14 cm
∴ Radius of the semicircle = 7 cm
Now, area of the semicircle = $(\pi R^2)/2$
= (22/7×7×7)/2 $cm^2$
= 77 $cm^2$
∴ Area of two semicircles = 2×77 $cm^2$ = 154 $cm^2$
Hence, area of the shaded region = Area of the Square – Area of two semicircles = 196 $cm^2$ -154 $cm^2$
= 42 $cm^2$