

Question Bank – Set A

Class – 10

Subject – Mathematics

Q. 1. If LCM is divided by HCF of the following numbers, then the number is $2^3 \times 5$ and $2^2 \times 5^2$

- (a) 10 (b) 20 (c) 25 (d) 40

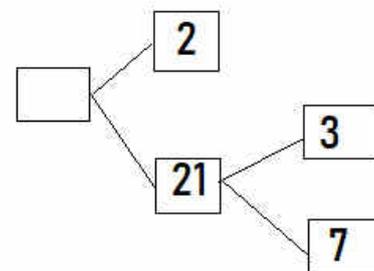
Q. 2. The product of HCF and LCM of smallest prime number and smallest composite number is

- (a) 1 (b) 2 (c) 4 (d) 8

Q. 3. In the given following rational numbers, which is non terminating decimal ?

- (a) $17/8$ (b) $15/1600$ (c) $187/306$ (d) $15/25$

Q. 4. Complete the missing entries in the following factor tree.



- (a) 84 (b) 63 (c) 147 (d) 42

Q. 5. To enhance the reading skills of grade X students, the school nominates you and two of your friends to set up a class library. There are two sections- section A and section B of grade X. There are 32 students in section A and 36 students in section B.

(i) What is the minimum number of books you will acquire for the class library, so that they can be distributed equally among students of Section A or Section B ?

- (a) 144 (b) 128 (c) 288 (d) 272

(ii) If the product of two positive integers is equal to the product of their HCF and LCM is true then, the HCF (32, 36) is

- (a) 2 (b) 4 (c) 6 (d) 8

(iii) 36 can be expressed as a product of its primes as

- (a) $2^2 \times 3^2$ (b) $2^1 \times 3^3$ (c) $2^3 \times 3^1$ (d) $2^0 \times 3^0$

(iv) $7 \times 11 \times 13 \times 15 + 15$ is a

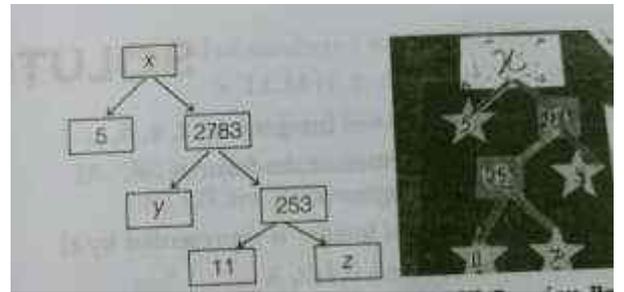
- (a) Prime number (b) Composite number (c) Neither prime nor composite (d) none of these

(v) If p and q are positive integers such that $p = ah^2$ and $q = a^2b$, where a, b are prime numbers, then the LCM (p, q) is

- (a) ab (b) a^2b^2 (c) a^3b^2 (d) a^3b^3

- Q. 6.** If p and q are co-prime numbers, then p^2 and q^2 are :
- (a) co-prime (b) not co-prime (c) even (d) odd
- Q. 7.** If LCM of a and 18 is 36 and HCF of a and 18 is 2, then $a =$
- (a) 2 (b) 3 (c) 4 (d) 1
- Q. 8.** The rational number $\frac{13}{3125}$ has a :
- (a) terminating decimal expansion (b) non-terminating decimal expansion
- (c) non-terminating repeating decimal expansion (d) non-terminating non-repeating decimal expansion
- Q. 9.** The sum of exponents of prime factors in the prime factorization of 196 is:
- (a) 3 (b) 4 (c) 5 (d) 2

- Q. 10.** A Mathematics Exhibition is being conducted in your School and one of your friends is making a model of a factor tree. He has some difficulty and ask for your help in completing a quiz for the audience. Observe the following factor tree and answer the following :



- (i) What will be the value of x ?
- (a) 15005 (b) 13915 (c) 56920 (d) 17429
- (ii) What will be the value of y ?
- (a) 23 (b) 22 (c) 11 (d) 19
- (iii) What will be the value of z ?
- (a) 22 (b) 23 (c) 17 (d) 19
- (iv) According to fundamental theorem of Arithmetic 13915 is a :
- (a) composite number (b) prime number (c) neither prime nor composite (d) even number
- (v) The prime factorization of 13915 is :
- (a) $5 \times 11^3 \times 13^2$ (b) $5 \times 11^3 \times 23^2$ (c) $5 \times 11^2 \times 23$ (d) $5 \times 11^2 \times 132$
- Q. 11.** “The product of two consecutive positive integers is divisible by 2.” This statement is _____.
- (a) true (b) false (c) can't say (d) partially true/false
- Q. 12.** If n is an even natural number, then the largest natural number, by which $n(n + 1)(n + 2)$ is divisible, is
- (a) 6 (b) 8 (c) 12 (d) 24

- Q. 13.** The least number, which is divisible by all the numbers from 1 to 10, is
 (a) 10 (b) 100 (c) 504 (d) 2520
- Q. 14.** “The rational form of $0.2\overline{54}$ is in the form of $\frac{p}{q}$, then $(p + q)$ is equal to 69.” Is this statement _____?
 (a) true (b) false (c) can't say (d) partially true/false
- Q. 15.** HCF and LCM are widely used in number system especially in real numbers in finding relationship between different numbers and their general forms. Also, product of two positive integers is equal to the product of their HCF and LCM. $\{Product\ of\ two\ numbers = HCF \times LCM\}$
 Based on the above information answer the following questions:
- (i) If two positive integers a and b are expressible in terms of primes as $a = p^2q^4$ and $b = p^3q^2$, then which of the following is true?
 (a) $HCF = pq^2 \times LCM$ (b) $LCM = pq^2 \times HCF$
 (c) $LCM = p^2q \times HCF$ (d) $HCF = p^2q \times LCM$
- (ii) Vishal has a collection of marbles realizes that if he makes a group of 2 or 3 marbles, there are always one marbles left, then which of the following is correct if the number of marbles is p^2 ?
 (a) p is odd (b) p is even (c) can't say (d) both (a) and (b)
- (iii) Given that $HCF(306, 657) = 9$, find $LCM(306, 657)$.
 (a) 33228 (b) 22833 (c) 22338 (d) none of these.
- (iv) The greatest number of 6-digits exactly divisible by 15, 24 and 36 is
 (a) 999998 (b) 999999 (c) 999720 (d) 999724
- (v) If N is the sum of first 13986 prime numbers, then N is always divisible by
 (a) 6 (b) 4 (c) 8 (d) none of these.
- Q. 16.** The HCF and LCM of two numbers are 33 and 264 respectively. When the first number is completely divided by 2 the quotient is 33. The other number is:
 (a) 66 (b) 130 (c) 132 (d) 196
- Q. 17.** Two natural numbers whose sum is 85 and the least common multiple is 102 are:
 (a) 30 and 55 (b) 17 and 68 (c) 35 and 55 (d) 51 and 34
- Q. 18.** The decimal expansion of number $\frac{441}{2^2 \times 5^3 \times 7}$ has:
 (a) a terminating decimal (b) non-terminating but repeating
 (c) non-terminating non repeating (d) terminating after two places of decimal

Q. 19.

The decimal expansion of the rational number $\frac{14587}{1250}$ will terminate after

- (a) one decimal place (b) two decimal places (c) three decimal places (d) four decimal places

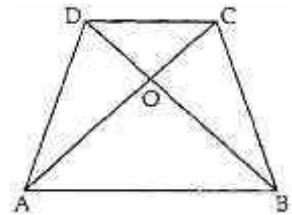
Q. 20. Determine the length of an altitude of an equilateral triangle of side $2x$ cm.

- (a) $x\sqrt{3}$ (b) $x\sqrt{3}/2$ (c) $x\sqrt{3}/4$ (d) $2x\sqrt{3}$

Q. 21. The perimeters of two similar triangles ABC and PQR are respectively 32 cm and 24 cm. If $PQ = 12$ cm. Find AB.

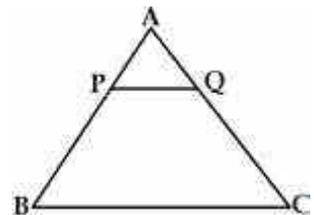
- (a) 18cm (b) 12cm (c) 6cm (d) 16cm

Q. 22. In the figure, AB is parallel to CD. If $OA = 3x - 19$, $OB = x - 4$, $OC = x - 3$ and $OD = 4$, determine x .



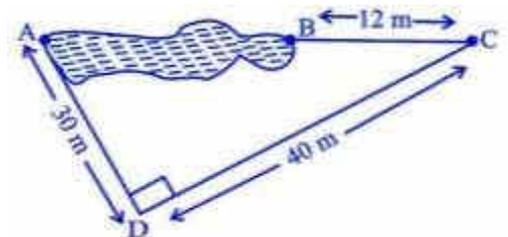
- (a) 8,11 (b) 9,12 (c) 7,10 (d) 6,9

Q. 23. In figure, $PQ \parallel BC$ and $AP : PB = 1 : 2$. Find $\frac{\Delta APQ}{\Delta ABC}$.



- (a) 1:2 (b) 1:4 (c) 1:9 (d) 1:16

Q. 24. Rohan wants to measure the distance of a pond during the visit to his native. He marks points A and B on the opposite edges of a pond as shown in the figure below. To find the distance between the points, he makes a right-angled triangle using rope connecting B with another point C are a distance of 12m, connecting C to point D at a distance of 40m from point C and the connecting D to the point A which is are a distance of 30m from D such the $\angle ADC = 90^\circ$.



(i) Which property of geometry will be used to find the distance AC?

- (a) Similarity of triangles (b) Thales Theorem (c) Pythagoras Theorem (d) Area of similar triangles

(ii) What is the distance AC?

- (a) 50m (b) 12m (c) 100m (d) 70m

(iii) Which of the following does not form a Pythagoras triplet?

- (a) (7,24,25) (b) (15,8,17) (c) (5,12,13) (d) (21,20,28)

(iv) The length AB is?

- (a)12m (b)38m (c)50m (d)100m

(v) Find the length of the rope used.

- (a)120m (b)70m (c)82m (d)22m

Q. 25. In $\triangle ABC$ it is given that $AB=9$ cm, $BC=6$ cm and $CA=7.5$ cm .Also $\triangle DEF$ is given such that $EF=8$ cm, and $\triangle DEF \sim \triangle ABC$. Then , perimeter of $\triangle DEF$ is :

- (a) 22.5cm (b) 25cm (c) 27cm (d) 30cm

Q. 26. If in $\triangle ABC$, $AB= 6$ cm and $DE \parallel BC$ such that $AE = \frac{1}{4} AC$, then the length of AD is:

- (a) 2 cm (b) 12 cm (c) 15 cm (d) 4 cm

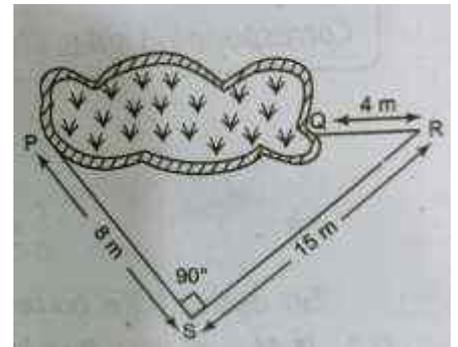
Q. 27. It is given that $\triangle ABC \sim \triangle DFE$, $\angle A = 30$ degrees, $\angle C = 50$ degrees, $AB=5$ cm, $AC=8$ cm and $DF=7.5$ cm, then which of the following is true?

- (a) $DE=12$ cm, $\angle F=50^\circ$ (b) $DE=12$ cm, $\angle F=100^\circ$ (c) $EF=12$ cm, $\angle D=100^\circ$ (d) $EF=12$ cm, $\angle D=30^\circ$

Q. 28. Which of the following statement is false:

- (a)all isosceles triangles are similar (b)all equilateral triangles are similar
(c)all circles are similar (d) none of the these

Q. 29. Sanjeev wants to measure a garden during the visit to his native. He marks points P and Q on the opposite edges of a garden as shown in the figure. To find the distance between the points, he makes a right-angled triangle using rope connecting Q with another point R at a distance of 4m, connecting R to point S at a distance of 15cm from the point R and connecting S to the point P which is at the distance of 8m from S such that triangle PRS is a right-angled triangle with $\angle S = 90^\circ$.



Based on the above information give the answer to the following questions:

(i) Which property of geometry will be used to find the distance PR ?

- (a)Similarity of triangles (b)Thales theorem (c) Pythagoras theorem (d) Area of similar triangles

(ii) What is the distance PQ of the garden?

- (a)10m (b)11m (c)12m (d)13m

(iii) What is the distance PR?

- (a)12m (b)17m (c)10m (d)9m

(iv) Find length of the rope used.

- (a)26m (b)25m (c)27m (d)23m

(v) Which of the following forms a Pythagorean Triplet?

- (a) (5,11,13) (b) (9,15,18) (c) (17,24,25) (d) (20,21,29)

Q. 30. Two sides and the perimeter of one triangle are respectively three times the corresponding sides and the perimeter of the other triangle then the two triangles are similar.

- (a) True (b) False (c) Can't say (d) Partially true/false

Q. 31. In ΔABC and ΔDEF , $\angle B = \angle E$, $\angle F = \angle C$ and $AB = 3DE$. Then the two triangles are

- (a) congruent but not similar (b) similar but not congruent
(c) neither congruent nor similar (d) congruent as well as similar

Q. 32. A girl of height 90 cm is walking away from the base of a lamp-post at a speed of 1.2 m/s. If the lamp is 3.6 m above the ground, then the value of length of her shadow after 4 seconds is

- (a) 3.2 m (b) 4.8 m (c) 1.6 m (d) 3.6 m

Q. 33. Right-angled triangle whose hypotenuse is of length p cm, one side of length q cm and $p - q = 1$, then the length of third side of the triangle is

- (a) $\sqrt{1 + 2q}$ cm (b) $(\sqrt{p} + \sqrt{q})$ cm (c) $\sqrt{p - q}$ cm (d) $(\sqrt{p} - \sqrt{q})$ cm

Q. 34. Vijay is trying to find the average height of a tower near his house. He is using the properties of similar triangles. The height of Vijay's house, is 20 m when Vijay's house casts a shadow 10 m long on the ground. At the same time, the tower casts a shadow 50 m long on the ground and the house of Ajay casts 20 m shadow on the ground.

Based on the above information, answer the following questions:

(i) What is the height of the tower?

- (a) 20 m (b) 50 m (c) 45 m (d) 60 m

(ii) What will be the length of the shadow of the tower when Vijay's house casts a shadow of 12 m?

- (a) 75 m (b) 50 m (c) 45 m (d) 60 m

(iii) What is the height of Ajay's house?

- (a) 30 m (b) 40 m (c) 50 m (d) 20 m

(iv) When the tower casts a shadow of 40 m, same time what will be the length of the shadow of Ajay's house?

- (a) 16 m (b) 32 m (c) 20 m (d) 8 m

(v) When the tower casts a shadow of 40 m, same time what will be the length of the shadow of Vijay's house?

- (a) 15 m (b) 32 m (c) 16 m (d) 8 m

Q. 35. Two quadrilaterals are similar, if their corresponding angles are equal.

- (a) True (b) False (c) Cannot say (d) Partially true/false

Q. 36. In $\triangle ABC$ and $\triangle DEF$, $\angle B = \angle E$, $\angle F = \angle C$ and $AB = 3DE$. Then, the two triangles are

- (a) congruent but not similar (b) similar but not congruent
 (c) neither congruent nor similar (d) congruent as well as similar

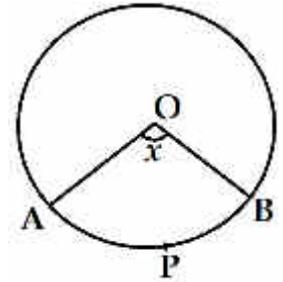
Q. 37. The areas of two similar triangles are in respectively 9 cm^2 and 16 cm^2 . The ratio of their corresponding sides is

- (a) 3:4 (b) 4:3 (c) 2:3 (d) 4:5

Q. 38. In a $\triangle ABC$, AD is the bisector of $\angle BAC$. If $AB = 6 \text{ cm}$, $AC = 5 \text{ cm}$ and $BD = 3 \text{ cm}$, then $DC =$

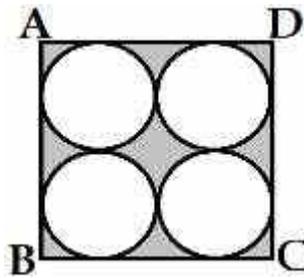
- (a) 11.3 cm (b) 2.5 cm (c) 3.5 cm (d) 1 cm

Q. 39. In figure, O is the centre of a circle. The area of sector OAPB is $\frac{5}{18}$ of the area of the circle. Find x .



- (a) 100° (b) 80° (c) 60° (d) 50°

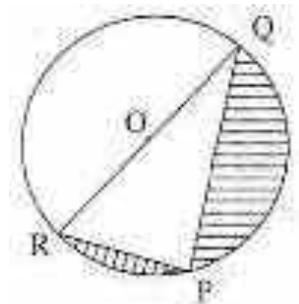
Q. 40. The area of the shaded region in figure, where ABCD is square of side 42 cm is



- (a) 278 cm^2 (b) 578 cm^2 (c) 378 cm^2 (d) 478 cm^2

Q. 41. In figure, $PQ = 24 \text{ cm}$, $PR = 7 \text{ cm}$ and O is the centre of the circle. The area of shaded region is _____.

[Use $\pi = 3.14$].

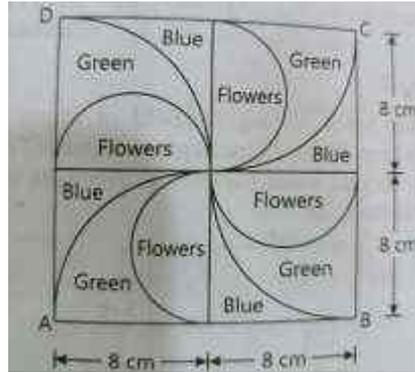


- (a) 178 cm^2 (b) 161.31 cm^2 (c) 150 cm^2 (d) 200 cm^2

Q. 42. If the area of a circle is numerically equal to twice its circumference, then the diameter of the circle is

- (a) 2 units (b) 4 units (c) 8 units (d) π units

- Q. 46.** The circumference of two concentric circles forming a ring are 88 cm and 66 cm respectively. The width of the ring is :
- (a) 14 cm (b) 7 cm (c) $\frac{7}{2}$ cm (d) 21 cm
- Q. 47.** The length of the minute hand of a clock is 7 cm. The area swept by the minute hand in 5 minutes, is :
- (a) 12.83 cm^2 (b) 10.33 cm^2 (c) 9.53 cm^2 (d) 11.37 cm^2
- Q. 48.** Shiva made a painting on a square chart paper ABCD. The painting is made up of squares, semi-circular arcs (painted with flowers) and arcs of quadrants of circles as shown below. He painted the same type of region with the same colours.



Based on above information, answer the following questions:

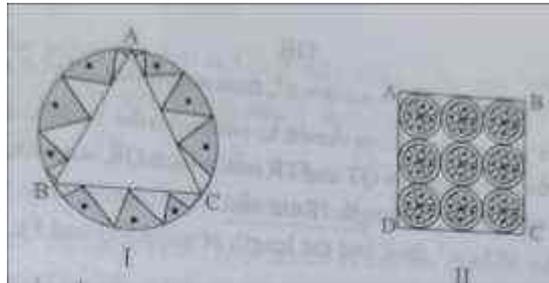
- (i) Find the total area of the region which is painted with flowers.
- (a) 90.8 cm^2 (b) 100.57 cm^2 (c) 105.6 cm^2 (d) 11.20 cm^2
- (ii) Find the area of all the quadrants given in the figure.
- (a) 190 cm^2 (b) 198.14 cm^2 (c) 201.14 cm^2 (d) 222.14 cm^2
- (iii) Find the area of the region which is painted green.
- (a) 100.57 cm^2 (b) 111.57 cm^2 (c) 120 cm^2 (d) 128.57 cm^2
- (iv) Find the area of the region which is painted blue.
- (a) 46.86 cm^2 (b) 48 cm^2 (c) 50.86 cm^2 (d) 54.86 cm^2
- (v) Find the total length of the boundary of the region which is painted green.
- (a) 128.57 cm (b) 132.56 cm (c) 145.57 cm (d) 150 cm
- Q. 49.** The perimeter of a square circumscribing a circle of radius “ a ” cm is equal to ____ cm.
- (a) $8a$ (b) $4a$ (c) $2a$ (d) $\frac{a}{2}$
- Q. 50.** If the perimeter of a protractor is 72 cm, then its area is
- (a) 12 cm^2 (b) 13 cm^2 (c) 14 cm^2 (d) none of these

Q. 57. The circumference of a circle exceeds the diameter by 16.8 cm. Then the circumference of the circle is.

- (a) 24.64 cm (b) 24 cm (c) 24.45 cm (d) 24.35 cm

Q. 58. Pookalam is the flower bed or flower pattern designed during Onam in Kerala. It is similar as Rangoli in North India and Kolam in Tamil Nadu. During the festival of Onam, your school is planning to conduct a Pookalam competition. Your friend who is a partner in competition, suggests two designs given below.

Observe these carefully.



Design I: This design is made with a circle of radius 32cm leaving equilateral triangle ABC in the middle as shown in the given figure.

Design II: This Pookalam is made with 9 circular design each of radius 7cm.

(i) The side of equilateral triangle in Design I is:

- (a) $12\sqrt{3}$ cm (b) $32\sqrt{3}$ cm (c) 48cm (d) 64cm

(ii) The altitude of the equilateral triangle in Design I is:

- (a) 8 cm (b) 12 cm (c) 48cm (d) 52cm

(iii) The area of square in Design II is:

- (a) 1264 cm^2 (b) 1764 cm^2 (c) 1830 cm^2 (d) 1944 cm^2

(iv) Area of each circular design in Design II is:

- (a) 124 cm^2 (b) 132 cm^2 (c) 144 cm^2 (d) 154 cm^2

(v) Area of the remaining portion of the square ABCD is

- (a) 378 cm^2 (b) 260 cm^2 (c) 340 cm^2 (d) 278