Class X Test (14-09-2019)

AP

Time: 1h 30min **M:M:53**

1. In an AP, if d = –4, n = 7, an = 4, then a is

   (a) 6 (b) 7 (c) 20 (d) 28

2. In an AP, if a = 3.5, d = 0, n = 101, then a_n will be

   (a) 0 (b) 3.5 (c) 103.5 (d) 104.5

3. The list of numbers – 10, – 6, – 2, 2... is

   (A) an AP with d = – 16 (B) an AP with d = 4

   (C) an AP with d = – 4 (D) not an AP

4. The 11^{th} term of the AP: $-5, \frac{-5}{2}, 0, \frac{5}{2}, \ldots\ldots\ldots..is$

   (A) –20 (B) 20 (C) –30 (D) 30

5. The first four terms of an AP, whose first term is –2 and the common differences –2, are

   (A)– 2, 0, 2, 4 (B)– 2, 4, – 8, 16

   (C)– 2, – 4, – 6, – 8 (D)– 2, – 4, – 8, –16

6. The 21^{st} term of the AP whose first two terms are –3 and 4 is

   (A) 17 (B) 137 (C) 143 (D) –143

7. If the 2^{nd} term of an AP is 13 and the 5^{th} term is 25, what is its 7^{th} term?

   (A) 30 (B) 33 (C) 37 (D) 38

8. Which term of the AP: 21, 42, 63, 84... is 210?

   (A) 9^{th} (B) 10^{th} (C) 11^{th} (D) 12^{th}

9. If the common difference of an AP is 5, then what is $a_{18} - a_{13}$?

   (A) 5 (B) 20 (C) 25 (D) 30

10. What is the common difference of an AP in which $a_{18} - a_{14} = 32$/

(A) 8 (B) – 8 (C) – 4 (D) 4

11. Two APs have the same common difference. The first term of one of these is–1 and that of the other is – 8. Then the difference between their 4th terms is

(A) –1 (B) – 8 (C) 7 (D) –9

12. If 7 times the 7th term of an AP is equal to 11 times its 11th term, then its 18thterm will be

(A) 7 (B) 11 (C) 18 (D) 0

13. The 4th term from the end of the AP: –11, –8, –5, ..., 49 is

(A) 37 (B) 40 (C) 43 (D) 58

14. The famous mathematician associated with finding the sum of the first 100 natural numbers is

(A) Pythagoras (B)Newton (C) Gauss (D)Euclid

15. If the first term of an AP is –5 and the common difference is 2, then the sum of the first 6 terms is

(A) 0 (B) 5 (C) 6 (D) 15

16. The sum of first 16 terms of the AP: 10, 6, 2... is

(A) –320 (B) 320 (C) –352 (D) –400

17. In an AP if a = 1, an= 20 and Sn = 399, then n is:

(A) 19 (B) 21 (C) 38 (D) 42

18. The sum of first five multiples of 3 is:

(A) 45 (B) 55 (C) 65 (D) 75

Section B (Carry 2 marks)

1. If the 3rd and the 9th terms of an AP are 4 and – 8 respectively, which term of this AP is zero?

2. Which term of the AP: 3, 15, 27, 39, . . . will be 132 more than its 54th term?

3. For what value of *n*, are the *n*th terms of two APs: 63, 65, 67, . . . and 3, 10, 17, . . . equal?

4. How many terms of the AP: 24, 21, 18, . . . must be taken so that their sum is 78?

5. Find the sums given below:

   (i) 34 + 32 + 30 + . . . + 10

6. In an AP:

   $(i)\ given\ a_n = 4, d = 2, S_n = -14$, find n and a.

7. If the sum of first 7 terms of an AP is 49 and that of 17 terms is 289, find the sum of first *n* terms.

Section C (Carry 3 marks)

1. If the sum of the first *n* terms of an AP is $4n - n^2$, what is the first term (that is S_1)? What is the sum of first two terms? What is the second term? Similarly, find the 3rd, the 10th and the *n*th terms.

2. A spiral is made up of successive semicircles, with centres alternately at A and B, starting with centre at A, of radii 0.5 cm, 1.0 cm, 1.5 cm, 2.0 cm, . . . as shown in Fig 1. What is the total length of such a spiral made up of thirteen consecutive semicircles? (Take $\pi = \frac{22}{7}$)

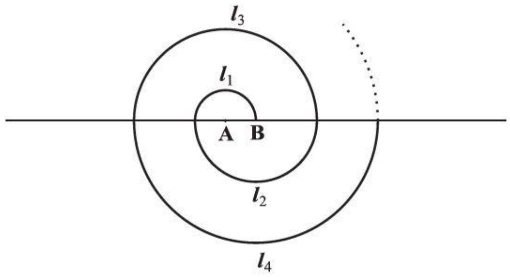
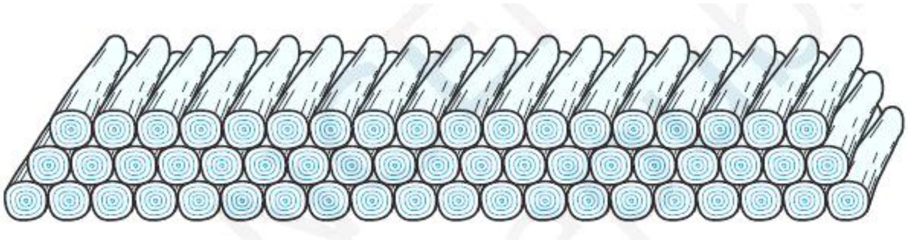


Fig 1

3. 200 logs are stacked in the following manner: 20 logs in the bottom row, 19 in the next row, 18 in the row next to it and so on see fig.2. In how many rows are the 200 logs placed and how many logs are in the top row?



$Fig\ 2$

4. In a potato race, a bucket is placed at the starting point, which is 5 m from the first potato, and the other potatoes are placed 3 m apart in a straight line. There are ten potatoes in the line see Fig. 3.

$Fig\ 3$

5. Which term of the AP : 121, 117, 113, . . ., is its first negative term?
6. The sum of the third and the seventh terms of an AP is 6 and their product is 8. Find the sum of first sixteen terms of the AP.

7. The houses of a row are numbered consecutively from 1 to 49. Show that there is a value of x such that the sum of the numbers of the houses preceding the house numbered x is equal to the sum of the numbers of the houses following it. Find this value of x.

CLASS X

CIRCLES

MM : 55 **Time : 1 hr 30 min**

SECTION A (CARRY 2 MARK EACH)

1. The in-circle of ΔABC touches the sides BC, CA and AB at D, E and F respectively, prove that area of ΔABC = $\frac{1}{2}$ (Perimeter of ΔABC) x r.
2. A circle touches all the four sides of quadrilateral ABCD. Prove that AB + CD = AD + BC.
3. From an external point P, two tangents PA & PB are drawn to the circle with centre O. prove that OP is perpendicular bisector of AB.
4. Two tangents TP and TQ are drawn to a circle with centre O from an external point T. Prove that ∠PTQ = 2 ∠OPQ.
5. A circle is touching the side BC of ΔABC at P and touching AB and AC produced at Q & R respectively. Prove that AQ = $\frac{1}{2}$ (Perimeter of ΔABC).
6. If a, b, c are the sides of right triangle where c is the hypotenuse, prove that radius of the in-circle which touches the sides of the triangle is give by r = $\frac{a+b-c}{2}$.
7. ABCD is a quadrilateral such that ∠D = 90. A circle touches the sides AB, BC, CD, DA at P, Q, R and S respectively. If BC = 38 cm, CD = 25 cm and BP = 27 cm, find radius r.
8. PQ is a chord of length 8 cm of a circle of radius 5 cm. the tangents at P and Q intersect at a point T. Find the length TP.

SECTION B (3 MARKS EACH)

9. If PA and PB are tangents from an outside point P such that PA = 10 cm and ∠APB = 60. Find the length of chord AB.
10. ABC is a right triangle right angled at B such that BC = 6 cm and AB = 8 cm. Find the radius of its in – circle.
11. From a point P, two tangents PA and PB are drawn to a circle with centre O. If ∠APB = 120. Prove that OP = 2 AP.
12. From a point P, tangents PA and PB are drawn to a circle with centre O. If OP = diameter of the circle, show that ΔAPB is equilateral.
13. BDC is a tangent to the given circle at point D such that BD = 30 cm and CD = 7 cm. The other tangents BE and CF are drawn respectively from B & C to the circle and meet when produced at A making ∠BAC is right angle. Calculate AF and area of ΔABC.
14. A triangle PWQR is drawn to circumscribe a circle of radius 8 cm such that the segment QT and TR, into which QR is divided by the point of contact, are of length 14 cm and 16 cm respectively. If area of ΔPQR = 336 cm^2, find the side PQ & PR.
15. The radius of the in-circle of a triangle is 4 cm and the segments in to which one side is divided by the point of contact are 6 cm and 8 cm. determine the other two sides of the triangle.
16. In figure 1, find ∠COD.
17. In figure 2, *AB* is a chord of the circle and *AOC* is its diameter such that ∠*ACB* = 50°. If *AT* is the tangent to the circle at the point *A*, Find ∠*BAT* .
18. From a point *P* which is at a distance of 13 cm from the centre *O* of a circle of radius 5 cm, the pair of tangents *PQ* and *PR* to the circle is drawn. Find the area of the quadrilateral *PQOR*.
19. In figure 3, *AT* is a tangent to the circle with centre *O* such that *OT* = 4 cm and ∠*OTA* = 30°.find AT.

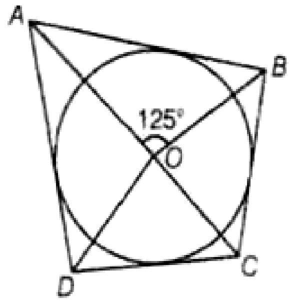


Figure 1

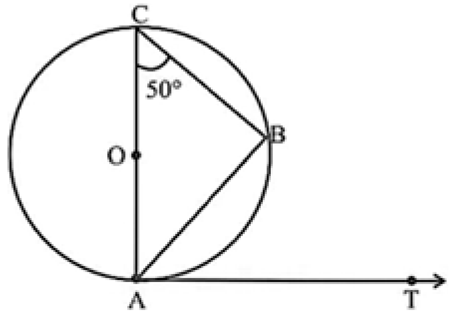


Figure 2

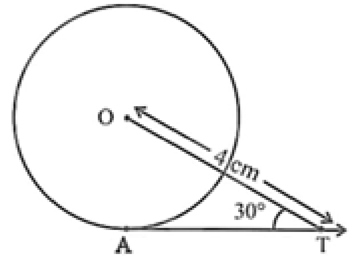


Figure 3

20. The radii of two concentric circles are 13 cm and 8 cm. AB is a diameter of the bigger circle. BD is tangent to the smaller circle touching it at D. Find the length AD.

21. In figure 4, if *PQR* is the tangent to a circle at *Q* whose centre is *O*, *AB* is a chord parallel to *PR* and $\angle BQR = 70°$, find $\angle AQB$.

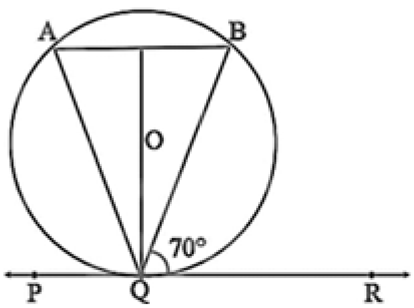


Figure 4

Class X Trigonometry Test (29-08-2019)

Section A (carry one marks)

1. Evaluate $tan15^0\ tan\ 20^0\ tan\ 60^0\ tan\ 70^0\ \tan 75^0$
2. Evaluate $\sin(45^0 - x) - \cos(x + 45^0)$
3. In $\Delta\ ABC$, prove that $\sin\left(\frac{A+B}{2}\right) = \cos\frac{C}{2}$
4. Find x, if $tan2\ x = \cot(60 - x)$
5. If $16 \tan A = 12$ find $\frac{3\ sinA+4cosA}{4sinA+3cosA}$
6. The maximum value of $sinx$ is………………
7. The value of $cos1^0\ cos2^0\ cos3^0\ \ldots\ldots\ldots\ldots cos179^0 =$
8. The value of $\frac{1+\tan^2 A}{1+\cot^2 A} =$______________
9. The value of $\frac{\cos^2 20^0+\cos^2 70^0}{\sec^2 70^0-\cot^2 20}$ is____________
10. The value of $(1 + tan\theta + sec\theta)(1 + cot\theta - cosec\theta) =$

Section B (carry two marks)

1. If $\sin(A + B) = \frac{\sqrt{3}}{2}$ and $\cos(A - B) = \frac{1}{\sqrt{2}}$ find A and B
2. If $tan\theta = \frac{20}{21}$, find the value of $\frac{1-sin\theta+cos\theta}{1+sin\theta+cos\theta}$
3. In ΔOPQ, right angled at P, if $OQ - OP = 1\ cm$ and $OP = 7\ cm$ find $sinQ$.

   Or

   If $\frac{cosx-sinx}{cosx+sinx} = \frac{1-\sqrt{3}}{1+\sqrt{3}}$, find x
4. Prove that $\frac{tan\theta+sec\theta-1}{tan\theta-sec\theta+1} = \frac{1+sin\theta}{cos\theta}$

Section C (carry 3 marks)

1. Prove that $\frac{tan\theta}{1-cot\theta} + \frac{cot\theta}{1-tan\theta} = 1 + sec\theta cosec\theta$
2. Prove that $(sin\theta + cosec\theta)^2 + (cos\theta + sec\theta)^2 = 7 + \tan^2\theta + \cot^2\theta$
3. If $sin\theta + cos\theta = \sqrt{2}cos\theta$, prove that $cos\theta - sin\theta = \sqrt{2}\ sin\theta$

   Or

   If $cosec\theta + cot\theta = p$, prove that $cos\theta = \frac{p^2-1}{p^2+1}$

Class X Real Numbers Test (02-09-2019)

Time 1h **M:M: 30**

Section A (Multiple Choice Question) (Carry 1 marks)

1. The decimal expansion of the rational number $\frac{33}{2^2.5}$ will terminates after

   (a) one decimal place

   (b) two decimal places

   (c) three decimal places

   (d) more than 3 decimal places

2. Euclid's division lemma states that for two positive integers a and b, there exist unique integers q and r such that $a = bq + r$, where r must satisfy

   (a) $1 < r < b$ (b) $0 < r \leq b$

   (c) $0 \leq r < b$ (d) $0 < r < b$

3. $n^2 - 1$ is divisible by 8, if n is:

   (a) an integer

   (b) a natural number

   (c) an odd integer

   (d) an even integer

4. The largest number which divides 70 and 125, leaving remainder 5 and 8, respectively, is:

   (a) 13 (b) 65

   (c) 875 (d) 1750

5. If two positive integers a and b are written as

   $a = x^3y^2 \ and \ b = xy^3; x, y$ are prime numbers, then $HCF\ (a, b)$ is:

   (a) xy (b) xy^2

   (c) x^3y^3 (d) x^2y^2

6. If two positive integers p and q can be expressed as

   $p = ab^2 \ and \ q = a^3b; \ a, b$ being prime numbers, then $LCM\ (p, q)$ is

   (a) ab (b) a^2b^2

   (c) $a^3\ b^2$ (d) $a^3\ b^3$

Section B (Short Answer Questions:) (Carry 1 marks)

1. The values of the remainder r, when a positive integer a is divided by 3 are 0 and 1 only. Justify your answer.
2. Can the number $6^n, n$ being a natural number, end with the digit 5? Give reasons.
3. Can two numbers have 18 as their HCF and 380 as their LCM? Give reasons.

4. Without actually performing the long division, find if $\frac{987}{10500}$ will have terminating or non-terminating (repeating) decimal expansions. Give reasons for your answer.
5. A rational number in its decimal expansion is 327.7081. What can you say about the prime factors of q. When this number is expressed in the form $\frac{p}{q}$? Give reasons.
6. Explain why $3 \times 5 \times 7 + 7$ is a composite number.

Section C (Carry 2 marks)

1. If n is an odd integer then show that $n^2 - 1$ is divisible by 8.
2. Prove that if x and y are both odd positive integers, then $x^2 + y^2$ is even but not divisible by 4.
3. Prove that $\sqrt{3} + \sqrt{5}$ is irrational.
4. On a morning walk, there persons step off together and their steps measure $40\ cm, 42\ cm$ and $45\ cm$, respectively. What is the minimum distance each should walk so that each can cover the same distance in complete steps?

Section D (Carry 3 marks)

(Do any two)

1. Prove that one and only one out of $n, n+2$ and $n+4$ is divisible by 3, where n is any positive integer.
2. Prove that one of any three consecutive positive integers must be divisible by 3.
3. For any positive integers n, prove that $n^3 - n$ is divisible by 6.

Section E (Carry 4 marks)

1. Show that cube of any positive integers is of the form:

   $9m$ or $9m + 1$ or $9m + 8$

CLASS – X (06 – 09 – 2019)

C0 – 0RDINATE GEOMETRY

SECTION – A (Carry 1 marks)

1. If the distance between the points (2, −2) and (−1, x) is 5, one of the values of x is

   (A) −2 (B) 2 (C) −1 (D) 1

2. The points A (9, 0), B (9, 6), C (−9, 6) and D (−9, 0) are the vertices of a

   (A) square (B) rectangle (C) rhombus (D) trapezium

3. The distance of the point P (2, 3) from the x-axis is

   (A) 2 (B) 3 (C) 1 (D) 5

4. AOBC is a rectangle whose three vertices are vertices A (0, 3), O (0, 0) and B (5, 0).

   The length of its diagonal is

   (A) 5 (B) 3 (C) $\sqrt{34}$ (D) 4

5. The perimeter of a triangle with vertices (0, 4), (0, 0) and (3, 0) is

   (A) 5 (B) 12 (C) 11 (D) $7 + \sqrt{5}$

6. The point which divides the line segment joining the points (7, −6) and (3, 4) in ratio

   1: 2 internally lies in the

   (A) I quadrant (B) II quadrant (C) III quadrant (D) IV quadrant

7. The point which lies on the perpendicular bisector of the line segment joining the

   points A (−2, −5) and B (2, 5) is:

   (A) (0, 0) (B) (0, 2) (C) (2, 0) (D) (−2, 0)

8. If the point P (2, 1) lies on the line segment joining points A (4, 2) and B (8, 4), then

(A) $AP = \frac{1}{3} AB$ (B) AP = PB (C) $PB = \frac{1}{3} AB$ (D) $AP = \frac{1}{2} AB$

9. A line intersects the y-axis and x-axis at the points P and Q, respectively. If (2, −5) is the mid-point of PQ, then the coordinates of P and Q are, respectively:

(A) (0, – 5) and (2, 0) (B) (0, 10) and (– 4, 0)

(C) (0, 4) and (– 10, 0) (D) (0, – 10) and (4, 0)

10. If the points A (1, 2), O (0, 0) and C (a, b) are collinear, then

(A) a = b (B) a = 2b (C) 2a = b (D) a = −b

SECTION – B (Carry 2 marks)

11. If the mid-point of the line segment joining the points A (3, 4) and B (k, 6) is P (x, y) and x + y – 10 = 0, find the value of k.

12. Find the area of the triangle ABC with A (1, −4) and the mid-points of sides through A being (2, – 1) and (0, – 1).

13. Find the points on the x–axis which are at a distance of $2\sqrt{5}$ from the point (7, −4). How many such points are there?

14. In what ratio does the x–axis divide the line segment joining the points (– 4, – 6) and (−1, 7)? Find the coordinates of the point of division.

15. If P (9a – 2, –b) divides line segment joining A (3a + 1, –3) and B (8a, 5) in the ratio 3 : 1, find the values of a and b.

OR

The mid-points D, E, F of the sides of a triangle ABC are (3, 4), (8, 9) and (6, 7). Find the coordinates of the vertices of the triangle.

SECTION – C (Carry 3 marks)

16. The points A (2, 9), B (a, 5) and C (5, 5) are the vertices of a triangle ABC right angled at B. Find the values of a and hence the area of ΔABC.
17. A (6, 1), B (8, 2) and C (9, 4) are three vertices of a parallelogram ABCD. If E is the midpoint of DC, find the area of Δ ADE.
18. If the points A (1, –2), B (2, 3) C (a, 2) and D (– 4, –3) form a parallelogram, find the value of an and height of the parallelogram taking AB as base.
19. Find the center of a circle passing through (6, -6), (3, -7) and (3, 3).
20. The two opposite vertices of a square are (-1, 2) and (3, 2). Find the coordinates of the other two vertices.

OR

The vertices of ΔABC are A(4, 6), B(1, 5) and C(7, 2). A line is drawn to intersect sides AB and AC at D and E respectively, such that $\frac{AD}{AB} = \frac{AE}{AC} = \frac{1}{4}$. Calculate the area of ΔADE and compare it with the area of ΔABC.

CLASS – X (04 – 09 – 2019)

LINEAR EQUATIONS & POLYNOMIALS

MM : 35 **TIME : 1 Hr**

Section – A (Carry 2 mark each)

1. Vijay had some bananas, and he divided them into two lots A and B. He sold the first lot at the rate of Rs 2 for 3 bananas and the second lot at the rate of Re 1 per banana, and got a total of Rs 400. If he had sold the first lot at the rate of Re 1 per banana, and the second lot at the rate of Rs 4 for 5 bananas, his total collection would have been Rs 460. Find the total number of bananas he had. Only formulate the equations.

   Or

   If three times the larger of two number is divided by smaller one, we get 4 as a quotient and 3 as a remainder. Also, if seven times the smaller number is divided by the larger one, we get 5 as quotient and 1 as remainder. Find the number.

2. The sum of a two-digit number and the number obtained by reversing the order of its digit is 110. If 10 is subtracted from the first number, the new number is 4 more than 5 times the sum of the digits of two-digit number. Find the number. Only formulate the equations.

3. Students of a class are made to stand in rows. If one student is extra in a row, there would be 2 rows less. If one student is less in a row, there would be three rows more. Find the number of students in a class. Only formulate the equations.

4. 8 men and 12 boys can finish a piece of work in 10 days while 6 men and 8 boys can do the same work in 14 days. Find the time taken by one man and one boy alone to finish the work. Only formulate the equations.

Or

A and B each have certain number of oranges. A says to B," if you give me 10 of your oranges, I will have twice as many as left with you." B replies," if you give me 10, I will have same number of oranges as many as left with you." How many oranges does each have? Only formulate the equations.

5. Anaya travels 600 km to her home partly by train and partly by bus. She takes 8 hours if she travels 120 km by train and the remaining by bus. If she travels 200 km by train and the remaining by bus, she takes 20 minutes longer. Find the speed of the train and the bus separately. Only formulate the equations. Only formulate the equations.

6. A train covered a certain distance at a uniform speed. If the train would have been 6km/hr faster, it would have taken 4 hours less than the scheduled time. And, if train were slower by 6km/hr, it would have taken 6 hours more than the scheduled time. Find the length of journey. Only formulate the equations.

7. Determine the value of a and b for which system of equations have infinitely many solutions:

   $2x - (a - 4)y = 2b + 1$ and $4x - (a - 1)y = 5b - 1$

8. If α *and* β are zeros a quadratic polynomial $f(x) = 3x^2 - 6x + 4$, find $\boldsymbol{\frac{\alpha}{\beta} + \frac{\beta}{\alpha} + 2\left(\frac{1}{\alpha} + \frac{1}{\beta}\right) + 3\alpha\beta}$

9. If α *and* β are zeros of f(x) = $3x^2 - 4x + 1$, form a quadratic polynomial whose zeros are $\frac{\alpha^2}{\beta}, \frac{\beta^2}{\alpha}$

10. If the zeros of the polynomial f(x) = $x^3 - 3x^2 + x + 1$ are a – b, a, a + b, find a and b.

Section B (Carry 3 mark each)

11. Given that $\sqrt{5}$ is a zero of the cubic polynomial $x^3 - 3\sqrt{5}x^2 + 13x - 3\sqrt{5}$, find all the other zeros.

12. Find all the zeros of the polynomial f(x) = $x^4 - 6x^3 - 26x^2 + 138x - 35$, if two of its zeros are $2 + \sqrt{3}$ *and* $2 - \sqrt{3}$.

Or

Find the values of a and b so that $x^4 + x^3 + 8x^2 + ax + b$ is divisible by $x^2 + 1$.

13. If the polynomial $x^4-6x^3+16x^2-25x+10$ is divided by x^2-2x+k, the remainder comes out be x + b, find k and b.

14. Find k, if $x^2 + 2x + k$ is a factor of $2x^4 + x^3 - 14x^2 + 5x + 6$. Also find all the zeros of the two polynomials.

15. A boat goes 30 km upstream and 44 km downstream in 10 hours. In 13 hours, it can go 40 km upstream and 55 km down-stream. Determine the speed of the stream and that of the boat in still water. Only formulate the equations.

Rough Work

Class X Test (31-08-2019)
Constructions, Probability and Triangles

Section A (carry 2 marks)

1. 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, find the length of her shadow after 4 seconds.

2. D is a point on the side BC of a triangle ABC such that $\angle ADC = \angle BAC$. Show that $CA^2 = CB.CD$.

3. In fig 1, ABC and DBC are two triangle on the same base BC. If AD intersects BC at O, show that $\frac{ar\ (ABC)}{ar\ (DBC)} = \frac{AO}{DO}$

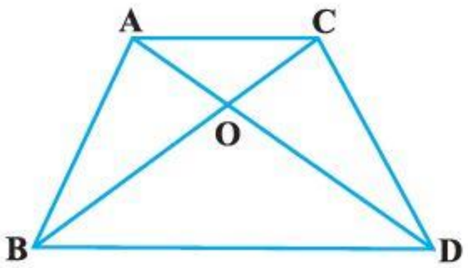


Fig 1

Or

Prove that the area of an equilateral triangle described on the side of a square is equal to half the area of the equilateral triangle described on one of its diagonals.

4. D and E are points on the sides CA and CB respectively of a triangle ABC right angled at C. Prove that $AE^2 + BD^2 = AB^2 + DE^2$.

5. In fig 2. ABC is a triangle in which $\angle ABC < 90^0$ and $AD \perp BC$. Prove that $AC^2 = AB^2 + BC^2 - 2BC.BD$.

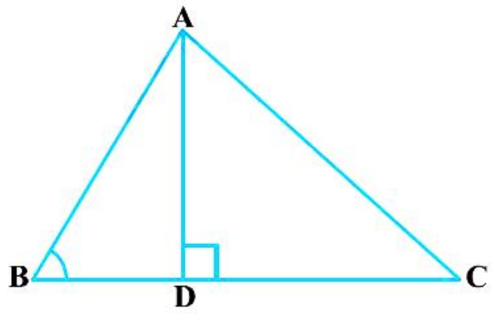


Fig 2

6. A box contains 90 discs which are numbered from 1 to 90. If one disc is drawn at random from the box, find the probability that it bears:
   (i) a two-digit number
   (ii) a perfect square number
   (iii) a number divisible by 5

Section B (carry 3 marks)

1. State and prove Pythagoras theorem

2. In an equilateral triangle ABC, D is a point on side BC such that $BD = \frac{1}{3} BC$. Prove that $9AD^2 = 7AB^2$.

3. In fig 1. The line Segment XY is parallel to side AC of $\Delta\, ABC$ and it divides the triangle into two parts of equal areas. Find the ratio $\frac{AX}{AB}$

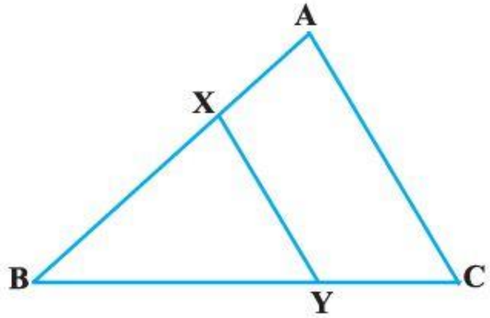


Fig 1

Or

O is any point inside a rectangle $ABCD$ as shown in fig 2. Prove that $OB^2 + OD^2 = OA^2 + OC^2$.

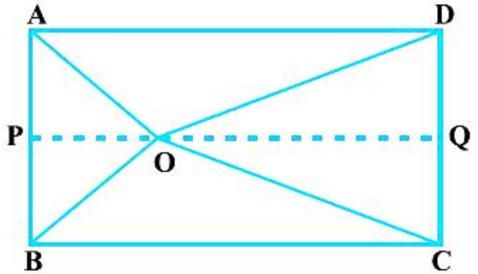


Fig 2

4. Draw a triangle ABC with side $BC = 6cm, AB = 5\ cm$ and $\angle ABC = 60^0$. Then constant a triangle whose side are $\frac{3}{4}$ of the corresponding sides of the triangle ABC.

Or

In fig 3. $\angle ACB = 90^0$ and $CD \perp AB$. Prove that $\frac{BC^2}{AC^2} = \frac{BD}{AD}$.

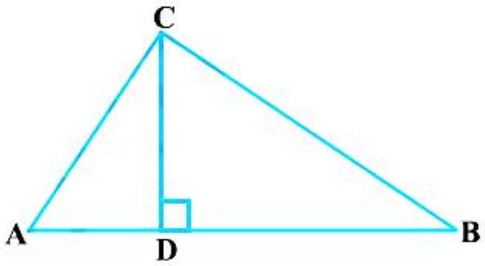


Fig 3

5. A box contains 12 balls out of which x are black. If one ball is drawn at random from the box, what is the probability that it will be a black ball? If 6 more black balls are put in the box, the probability of drawing a black ball is now double of what it was before. Find x.

6. Draw a pair of tangents to a circle of radius 5 cm which are inclined to each other at an angle of 60^0