MATHS

BOOKS - CENGAGE MATHS (HINGLISH)

PROPERTIES OF TRIANGLE, HEIGHT AND DISTANCE

Question Bank

1. The area of a right triangle is 6864 square units. If the ratio of its legs is $143:24$, then

find the radius of the circle inscribed in the triangle.

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2. In ΔABC, the incircle touches the sides BC, CA and AB respectively at D, E and F. If the radius of the incircle is 4 units and BD, CE and AF are consecutive integers, then find the perimeter of the A B C`.

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3. The altitudes from the angular points A, B and C on the opposite sides BC, CA and AB of ΔABC 'are 210,195 and 182 respectively. If the length of the side BC can be expressed as rational $\frac{m}{n}$ (in the lowest form), then find $(m+n)$.

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4. Sum of all the radii of the circles touching the coordinate axes and the line $3x+4y=12$, is

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5. In triangle ABC if $\sin A \sin B \sin C$ is equal to 10^{-3} and $(AB)(BC)(CA)$ is equal to 10^3 then the area of triangle ABC, is

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6. In ΔABC, if angle C=3 angle A, B C=27` and A B=48 , then find the length of the side A C .

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7. The sides a, b and c of triangle ABC satisfy $(a+1)bc = \quad 12, \quad (b+1)ca = 4 \quad$ and $(c+1)ab = 4$If area of triangle equals $\frac{\sqrt{4n^2-1}}{4}n$ where $n \in N$, then find the value of n.

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8. The area of a triangle ABC is equal to $\left(a^2+b^2-c^2\right)$, where a, b and c are the sides of the triangle. The value of $\tan C$ equals

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9. Triangle ABC has $AC = 13$, $AB = 15$ and $BC = 14$. Let Obe the circumcentre of the A B C. $Ifthe \leq n > hofperpendicaromthep\oint'$ O'onB Ccanbe exp $ressedasarationalm/n \in thelowestf$ or $mthenf \in d$(m+n)`.

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10. Consider a point $P\left(4, \sqrt{2}\right)$ points Q, R which respectively lie on the lines $y = x$ $y = 0$. If ΔPQR is formed and its minimum perimeter is a, then a is equal to

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11. With usual notation, in triangle ABC, $a = 4, b = 5, c = 7$. Let internal angle bisector through A intersect side BC at D, then the value of $\frac{AI}{ID}$ is

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12. If circumradius and inradius of A B C $be10$ and $3respectively, thenf \in dthevalueof$ a cot A+b cot B+ccot C`

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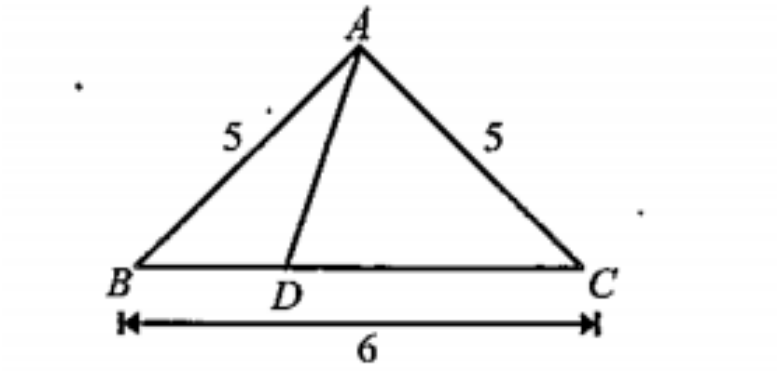
13. Figure shows triangle ABC such that $AB = AC = 5, BC = 6. P \oint$Dison B C$sucht\hat{}$ (B D)/(D C)=1/2, $then \square of \leq n > hofside$A D`

is



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14. In acute ΔABC, ratio of distance of orthocentre from vertex A and distance of circumcentre from side BC is equal to

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15. If a, b, c are in A.P. then the numerical value of $3\frac{\tan A}{2}\frac{\tan C}{2}$ is

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16. In A B C, if $AB = 10, BC = 8, CA = 12$ and a point D is taken on AB such that A D: D B is 3:2 , then the square of length of CD is

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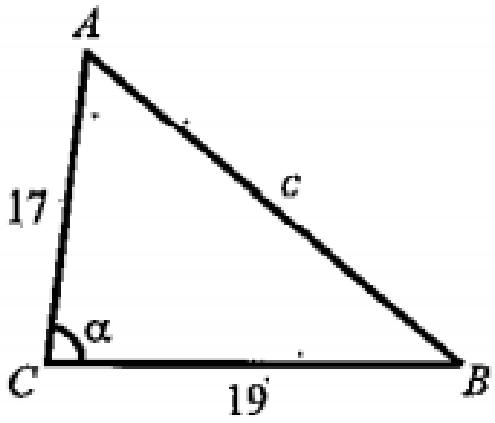
17. Consider the triangle pictured as shown. If $0 < \alpha < \frac{\pi}{2}$ then the number of integral values of c is



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18. In A B C, if $a = 2, r = \frac{1}{\sqrt{3}}$ and $\angle A = 60^\circ$ and the length of median from vértex B is k, value of k^2 is [Note: All the symbols used have usual meaning in A B C .]`

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19. Given a O A B$has sides$O A=7, A B=11 and O B=14. T$is'the mid p \oint of$O A and $ap \oint$S $is taken on$B T $\div id \in git \in the ratio$2: 1 $then \square of area of SOT$ is

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20. The angle of elevation of the top of a tower by standing on a horizontal'plane at a point A is 15°. After walking $40m$ from A towards tower this angle becomes 30°. The height of the tower (in metres) is

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21. An aeroplane flying at a height 300 metre above the ground passes vertically above

another plane at an instant when the angles of elcvation of the two planes from the same point on the ground are 60° and 45° respectively. Then the height of the lower plane from the ground (in metres) is

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22. The angles of elevation of the top of a tower at the top and the foot of a pole of height $10m$ are 30° and 60° respectively. The height of the towcr (in metres) is

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23. A flagstaff on the top of the tower 80 meter high, subtends an angle $\tan^{-1}\left(\frac{1}{9}right\right)$ at a.point on the ground 100 -meters away from the foot of the tower. Find the height of the flag-staff (in metres)

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24. A 6 -ft tall man finds that the angle of elevation of the top of a 24 -ft-high pillar and

the angle of depression of its hase are complementary angles. The distance of the man (in metres) from the pillar is

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25. A flagstaff $5\sim m$ high is placed on a building $25m$ high. If the flag and building both subtend equal angles on the observer at a height $30m$, the distance between the observer and the top of the flag (in metres) is

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26. A man standing on a level plane oberves the elevation of the top of a pole to be θ. He then walks a distance equal to double the height of the pole and then finds that the elevation is now 2θ. Then $\cot\theta$ is equal to

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27. Two parallel towers A and B of different heights are at some distance on same level ground. If angle of elevation of a point P at

$20m$ height on tower B from a point Q at $10m$ height on tower A is θ and is equal to half the-angle of elevation of point R at $50m$ height on A from point P on B, then sine of θ is

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28. A man from the top of a 100 metres high tower sees a car moving towards the tower at an angle of depression of 30°. After some time, the angle of depression becomes 60°.

The distance (in metres) travelled by the car during this time is

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29. From the top of a light house, $60m$ high with its base at sea level, the angle of depression'of a boat is 15°.The distance of the boat (in metres) from the light house is

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30. At a point A, the angle of elevation of a tower is such that its tangerit is $\frac{5}{12}$, on walking $120m$ nearer the tower the tangent of the angle of elevation is $\frac{3}{4}$. The height of the tower (in metres) is

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31. A man of height 6 ft. observe the top of a tower and the foot of the tower at angle of $.45^\circ$ and 30° of elevation and depression

respectively. The height of the tower (in metres) is

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32. For a man, the angle of elevation of the highest point of the temple situated east of him is 60°. On walking 240 metres to north, the angle of elevation' is reduced to 30°, then the height of the temple is

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