MATHS

BOOKS - ICSE

CHAPTERWISE REVISION (STAGE 3)

Rational And Irrational Numbers

1. Rationalise the denominator of :

$$\frac{1}{\sqrt{6}} + \frac{1}{\sqrt{5}}$$

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2. Express $53\overline{629}$ as a fractions in the form $\frac{x}{y}$ where x, y , $\in 1$ and $y \neq 0$

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3. Express each of the following as a fractions in the form $\frac{x}{y}$ where x, y , $\in 1$ and $y \neq 0$,

2. $\overline{476}$

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4. If $x^2 = 11 + 2\sqrt{30},$ find :

x

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5. If $x^2 = 11 + 2\sqrt{30},$ find :

$\frac{1}{x}$

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6. If $x^2 = 11 + 2\sqrt{30},$ find :

$x + \frac{1}{x}$

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Compound Interest

1. If $x^2 = 11 + 2\sqrt{30},$ find :

$x - \frac{1}{x}$

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2. Prove that $2 + \sqrt{3}$ is an irrational number.

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3. If $x = \frac{\sqrt{5}-\sqrt{3}}{\sqrt{5}+\sqrt{3}}$ and $y = \frac{\sqrt{5}+\sqrt{3}}{\sqrt{5}-\sqrt{3}}$ find the value of $x^2 + y^2$

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4. The interest charged on a certain sum is 720 for one year and 1.497.60 for two years. Find, whether the interest is simple or compound Also, calculate the rate per cent and the sum.

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5. The population of a town increases 10% every 3 years. If the present population of the town is 72.600, calculate

its population 6 years ago.

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6. The population of a town increases 10% every 3 years. If the present population of the town is 72.600, calculate

its population 6 years ago.

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7. The cost of a machine depreciated by rupes 4,752 during the second year and by 4,181.76 during the third year. Calculate :

the rate of depreciation:

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8. The cost of a machine depreciated by rupees 4,752 during the second year and by 4,181.76 during the third year. Calculate :

the original cost of the machine,

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9. The cost of a machine depreciated by rupes 4,752 during the second year and by 4,181.76 during the third year. Calculate :

the cost of the machine at the end of the third year.

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10. Pramod borrowed 60,000 at 12% per annum compound interest. If he pays 50% of the sum borrowed at the end of the first year and 50% of the remaining loan at the end of the second year, find the amount of loan outstanding at the beginning of the third year.

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11. Roshan invests 2,40,000 for 2 years at 10% per annum compounded anually. If the income tax at 20% is deducted at the end of each year on the interest accrued, find the amount he will receive at the end of 2 years.

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12. Amol bought a plot of land for 70,000 and a car for 32,000 on the same day. The value of the plot appreciates uniformly at the rate of 10% every year

while the value of the car depreciates by 20% for the first year and by 10% for the second year. If Amol sells the plot of land as well as the car after 2 years, what will be the profit or loss on the whole ?

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13. On what sum of money will the difference between the compound interest and simple interest for 3 years be equal to Rs 930, if the rate of interest charged for both is 10% p.a ?

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14. A certain sum of money is invested at a certain fixed rate compounded yearly. If the interest accrued in two years be 44% of the sum borrowed, find the rate of compound interest.

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15. rupees 12,000 is invested for $1\frac{1}{2}$ years at C.I annually. If Rs 15,972 is received at the end of this period, find the rate of interest per annum.

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16. If $x - \frac{1}{x} = 4$, find the value of :

$x + \frac{1}{x}$

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17. If $x - \frac{1}{x} = 4$, find the value of :

$x^2 + \frac{1}{x^2}$

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18. If $x - \frac{1}{x} = 4$, find the value of :

$x^4 + \frac{1}{x^4}$

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19. If 3a + 4b =9 and ab= 2 find the value of : $27a^3 + 64b^3$

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20. If $x - \frac{1}{x} = y, x \neq 0$, find the value of $\left(x - \frac{1}{x} - 2y\right)^3$

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21. The sum of two numbers is 7 and the sum of their cubes is 133. Find the sum of their squares

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Factors

1. Express each of the following in factors form,

$$a^3(b-c)^3+b^3(c-a)^3+c^3(a-b)^3$$

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2. Express each of the following in factors form,

$$(5x-3y)^3+(3y-8z)^3+(8z-5x)^3$$

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3. Simplify :

$$\frac{x^4-16}{x^3+2x^2+4x+8}$$

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4. Factorise:

$$a^3+ab(1-2a)-2b^2$$

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5. Factorise:

$a^2 - b^2 - 4ac + 4c^2$

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6. Factorise:

$\sqrt{5}x^2 + 2x - 3\sqrt{5}$

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7. Factorise:

$4(2a-b+c)^2-9(a+b-c)^2$

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8. Factorise :

$(x-y)^3-8x^3$

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9. Factorise:

$(x-2)(x+2)+3$

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Simutaneous Equations

1. Solve for x and y :

mx- ny = $m^2 + n^2$

$$x - y = 2n$$

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2. The sides of an equilateral triangles are given by

x+ 3y , 3x+ 2y - 2 and $4x + \frac{1}{2}y + 1$

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3. 6 men and 8 boys can do a piece of work in 7 days, while 8 men and 12 boys do the same work in 5 days. How long would it take one boy to finish the same work?

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4. A and B have 460 coins altogether. If $\frac{3}{4}$ of A's number of coins is equal to $\frac{2}{5}$ of B's number of coins, find how many coins must B give to A so that they both have equal number of coins.

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5. Rohit went to a bank to withdraw rupes 4,000. He asked the cashier to give 50 and 100 notes only. Rohit got 50 notes in all. Find how many notes of 50 and 100 he received

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6. Can the following equation hold simultaneusly? If yes, state the values of x and y

$$\frac{x}{2}+\frac{5y}{3}=12$$

$$0.7x-0.3y=1 \text{ and } 1.25x=4+\frac{y}{6}$$

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7. In a two digit number, the sum of the digits is 7. If the number with the order of digits reversed is 28 greater than twice the unit's digit of the original number, find the number.

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8. At a certain time, in a deer park, the number of heads and the number of legs of deer an human visitors were counted and it was found that there

were 41 heads and 136 legs. Find the number of deer and human visitors in the park.

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9. Ten percent of the black balls were added to twenty percent of the white balls and the balls were 24. Three times the number of black balls exceeds the number of white balls by 20. Find the number of black balls and also, the number of white balls.

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10. A two digit number is obtained by either multiplying the sum of the digits by 8 and subtracting 5 or by multiplying the difference of the digits by 16 and then adding 3. Find the number.

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11. A shopkeeper sells article A at 8% profit and article B at 10% loss, thereby getting a sum of 1,008. If he sells the article A at 10% profit and article B at 8% loss, he would have 1,028. Find the cost price of article A and B to the shopkeeper.

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Indices

1. Simplify :

$$\left(x^{\frac{1}{3}} - x^{-\frac{1}{3}}\right)\left(x^{\frac{2}{3}} + 1 + x^{-\frac{2}{3}}\right)$$

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2. Solve :

$$5^x = 25 \times 5^y \text{ and } 8 \times 2^y = 4^x$$

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3. Solve :

$8^{x+1} = 16^{y+2}$ and $\left(\frac{1}{2}\right)^{3+x} = \left(\frac{1}{4}\right)^{3y}$

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4. Prove that:

$$\left(\frac{x^a}{x^b}\right)^{a^2+ab+b^2} \times \left(\frac{x^b}{x^c}\right)^{b^2+bc+c^2} \times \left(\frac{x^c}{x^a}\right)^{c^2+ca+a^2} = 1$$

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5. If $2^{98} - 2^{97} - 2^{96} + 2^{95} = m \times 2^{95}$, find the value of m .

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6. Find the value of a, $(a \neq$ integer) if :

$$2^{a-5} \times 6^{2a-4} = \frac{1}{12^4 \times 2}$$

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Logarithm

1. Given $\frac{\log_{10}^{16}}{\log_{10}^{2}} = \log_{10}^{a}$ find the value of $(a + 100)$.

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2. Given

$3(\log 5 - \log 3) - (\log 5 - 3\log 6) = 2 - \log m,$

find m.

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3. If

$\log xy^3 = m$ and $\log x^3y^2 = p,$ find $\log\left(x^2 \div y\right)$

in terms of m and p.

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4. If $3\log\sqrt{m} + 2\log\sqrt[3]{n} = 1$. find the value of $m^9 n^4$.

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5. If a= $\log 20 \log 3$, $b = \log 3 - \log 5$ and $c = \log 2.5$ find the value of :

a + b+ c

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6. If a= $\log 20 \log 3, b = \log 3 - \log 5$ and $c = \log 2.5$ find the value of :

15^{a+b+c}

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7. Solve for x :

3^(log x)-2^(log x) =2^(log x+1)-3^(log x-1)

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8. Prove that :

$$\frac{1}{\log_a^{abc}} + \frac{1}{\log_b^{abc}} + \frac{1}{\log_c^{abc}} = 1$$

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9. Prove that :

$$\log_y^x . \log_z^y . \log_a^z = \log_a^x$$

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Triangles

1. ABCD is a square, X is the mid-point of AB and Y the mid-point of BC. Prove that

the triangles ADX and BAY are congruent.

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2. ABCD is a square, X is the mid-point of AB and Y the mid-point of BC. Prove that

$\angle DXA = \angle AYB$

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3. ABCD is a square, X is the mid-point of AB and Y the mid-point of BC. Prove that

DX is perpendicular to AY.

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4. The sides PQ, PR of triangle PQR are equal, and S, T are points on PR, PQ such that $\angle PSQ$ and $\angle PTR$ are right angles

Prove that the triangles PTR and PSQ are congruent.

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5. The sides PQ, PR of triangle PQR are equal, and S, T are points on PR, PQ such that $\angle PSQ$ and $\angle PTR$ are right angles

If OS and RT intersect at M, prove that the triangles PTM and PSM are congruent.

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6. ABCD is a square. P, Q and Rare the points on AB, BC and CD respectively, such that AP = BQ = CR. Prove that:

PB = QC

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7. ABCD is a square. P, Q and Rare the points on AB, BC and CD respectively, such that AP = BQ = CR. Prove that:

PQ = QR

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8. ABCD is a square. P, Q and Rare the points on AB, BC and CD respectively, such that AP = BQ = CR. Prove that:

If angle PQR is a rt. Angle find angle PRQ

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9. $ABC\ and\ DBC$ are two isosceles triangles on the same bas BC and vertices $A\ and\ D$ are on the same side of BC . If AD is extended to intersect BC at P, show that $ABD \cong ACD$ (ii) $ABP \cong ACP$

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10. Triangles ABC and DBC are two isosceles triangles on the same base BC and their vertices A and D are on the same side of BC. If AD is extended

to intersect BC at P, show that:

$\Delta ABP \cong \Delta ACP$

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11. Triangles ABC and DBC are two isosceles triangles on the same base BC and their vertices A and D are on the same side of BC. If AD is extended to intersect BC at P, show that:

AP bisects angle BAC and BDC.

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12. $ABC\ and\ DBC$ are two isosceles triangles on the same bas BC and vertices $A\ and\ D$ are on the same side of BC . If AD is extended to intersect BC at P, show that AP bisects $\angle A$ as well as $\angle D$ and AP is the perpendicular bisector of BC

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13. In a right triangle ABC, right angled at C, P is the mid-point of hypotenuse AB. C is joined to P and produced to a point D, such that DP = CP. Point D is joined to point B. Show that:

$\Delta APC \cong \Delta BPD$

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14. In a right triangle ABC, right angled at C, P is the mid-point of hypotenuse AB. C is joined to P and produced to a point D, such that DP = CP. Point D is joined to point B. Show that:

Angle DBC is a right angle.

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15. In a right triangle ABC, right angled at C, P is the mid-point of hypotenuse AB. C is joined to P and produced to a point D, such that DP = CP. Point D is

joined to point B. Show that:

$\Delta DBC \cong \Delta ACB$

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16. In a right triangle ABC, right angled at C, P is the mid-point of hypotenuse AB. C is joined to P and produced to a point D, such that DP = CP. Point D is joined to point B. Show that:

$CP = \frac{1}{2}AB$

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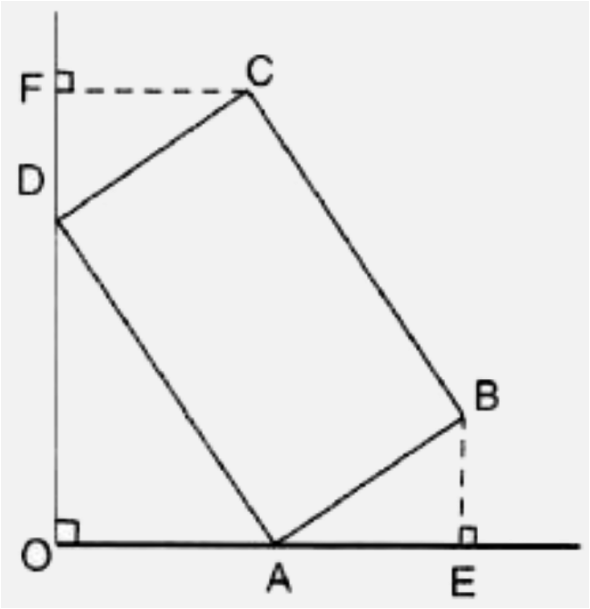
17. In the given figures , ABCD is a rectangle

Prove that : $\Delta ABE \cong \Delta CDF$.



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18. In quadrilateral PQRS , PS = QR and $\angle SPQ = \angle RQP$. Prove that :

$PR = QS$

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19. In quadrilateral PQRS , PS = QR and $\angle SPQ = \angle RQP$. Prove that :

$\angle QPR = \angle PQS$

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Isosceles Triangles

1. In $\Delta ABC, AB = AC$ and D is a point an side AC such that AD = BD = BC . Show that : $\angle ADB = 108^\circ$

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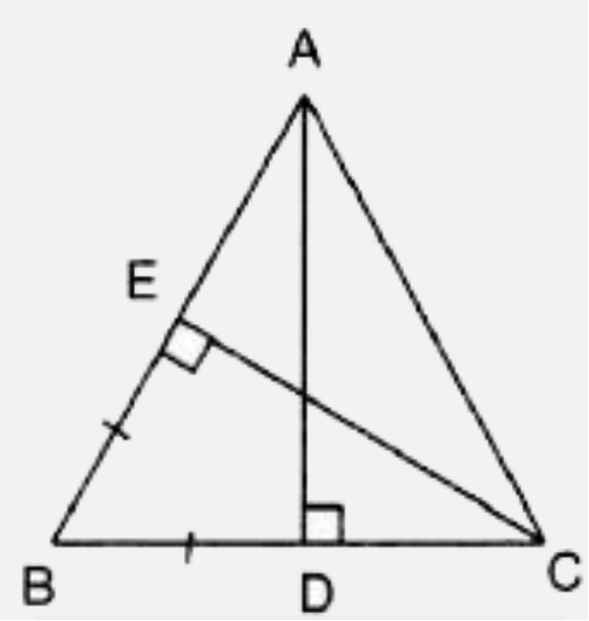
2. In the following figure , AB = BC , AD $\perp BC$ and $CE \perp AB$. prove that AD = CE



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Inequalities

1. In triangle ABC , the internal bisector of $\angle A \angle B$ and $\angle C$ meet at point I . Prove that :

$\frac{1}{2}(AB + BC + CA) < AI + BI + CI$

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2. In triangle ABC, $AB > AC$ and D is a point in side BC. Show that : $AB > AD$.

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3. The P lies on side AB of an equilateral triangle ABC. Arrange AC, AP and CP in descending order.

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4. In triangle ABC, side AC is greater than side AB. If the internal bisector of angle A meets the opposite side at point D, prove that : $\angle ADC$ is greater than $\angle ADB$.

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5. In a triangle ABC, side AC is greater than side AB and point D lies on side BC such that AD bisects angle BAC. Show that:

$\angle ADB$ is acute.

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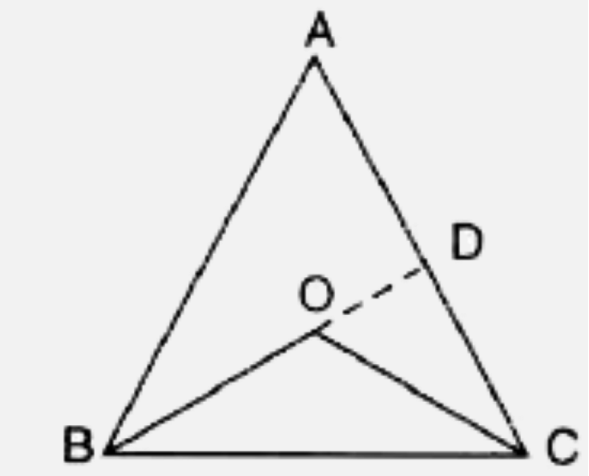
6. O is any point in the interior of a triangle ABC.

Prove that :

$OB + OC < AB + AC.$



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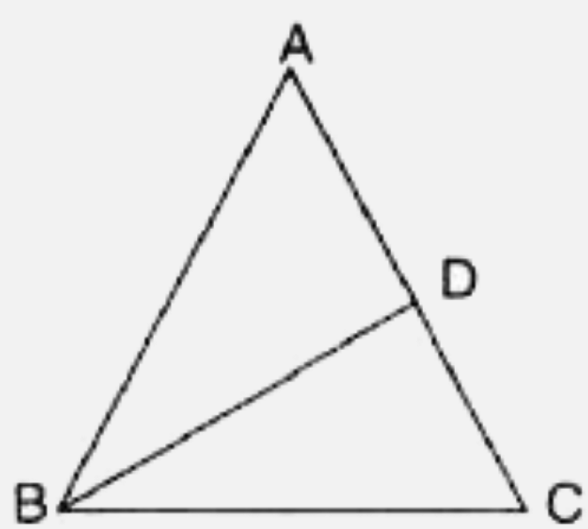
7. The given figure shows an equilateral triangles ABC and D is point in AC.

Prove that :

(i) $AD < BD$

(ii) $BC > BD$



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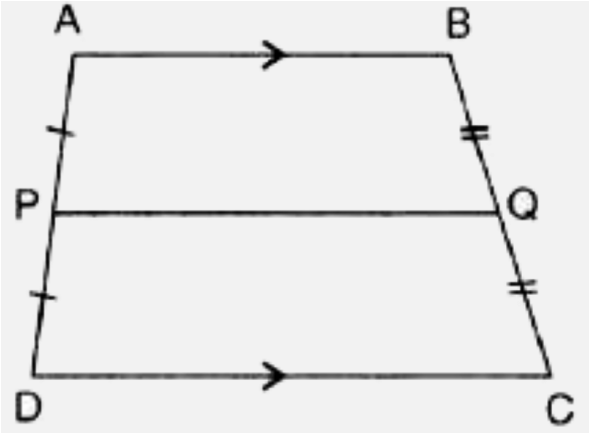
Mid Point Theorem

1. In the figure , given below. ABCD is a trapezium in which AB /DC , P is mid- point of AD and Q is mid-point of Bc.

Write a relations connecting AB , PQ and DC.

(ii) Find DC. If AB = 16 cm and PQ = 23 cm



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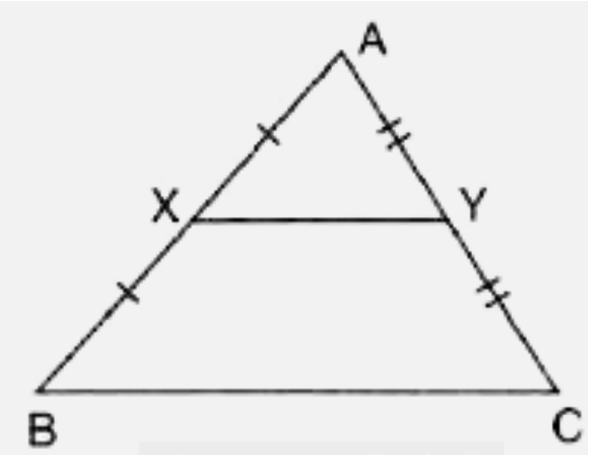
2. In the figure, given below X and Y are the mid-points of AB and AC respectively. Given that BC = 6 cm, AB = 5-4 cm and AC = 5-0 cm, calculate the perimeter of trapezium YXBC.



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3. In triangle ABC, D is a point in side AB such that AB = 4AD and E is a point in AC such that AC = 4AE. Show that BC : DE = 4:1

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4. In triangle ABC, D and E are mid-points of sides AB and BC respectively. Also, F is a point in side AC so that DF is parallel to BC

(i) Prove that DBEF is a parallelogram.

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5. In triangle ABC, D and E are mid-points of sides AB and BC respectively. Also, F is a point in side AC so that DF is parallel to BC

Find the perimeter of parallelogram DBEF, if AB = 10 cm, BC = 8.4 cm and AC = 12 cm.

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6. M and N divide the side AB of a triangle ABC into three equal parts . Through M and N, lines are drawn parallel to BC and intersecting AC at points P and Q respectively. Prove that P and Q divide AC into three equal parts.

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7. In parallelogram ABCD, E is mid-point of CD and through D, a line is drawr parallel to EB to meet CB produced at point G and to cut AB at point F. Prove that:

$2 \times AD = GC$

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8. In parallelogram ABCD, E is mid-point of CD and through D, a line is drawn parallel to EB to meet CB produced at point G and to cut AB at point F. Prove

that :

DG = 2EB

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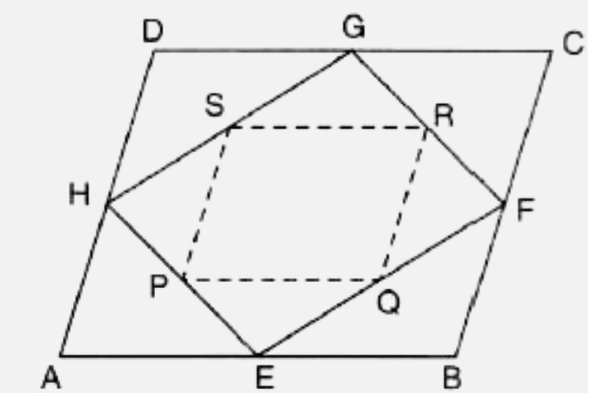
9. The given figure shows a quadrilateral ABCD in which E, F, G and H are the midpoints of consecutive sides of ABCD. Again P, Q, R and S are the mid-points of the consecutive sides of quadrilateral EFGH. If EFGH is a rectangle, show that : PQRS is a rhombus.



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Pythagoras Theorem

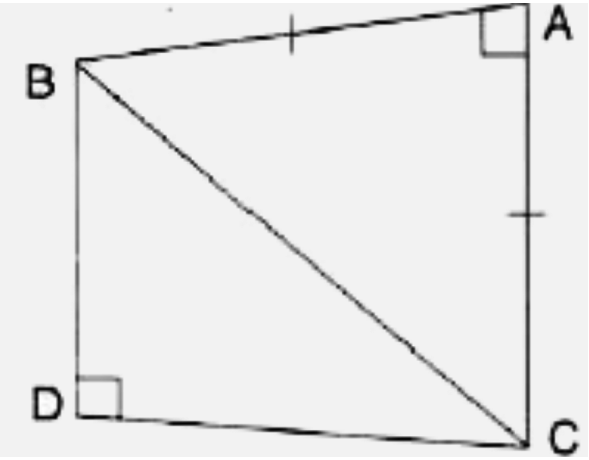
1. In the given figure,

$AB = AC, \angle A = \angle D = 90^\circ$

BD = 18 cm and DC =24 cm .

Calculate the length of AB correct to two places of decimal. Also . Find the perimeter of quadrilateral

ABDC.



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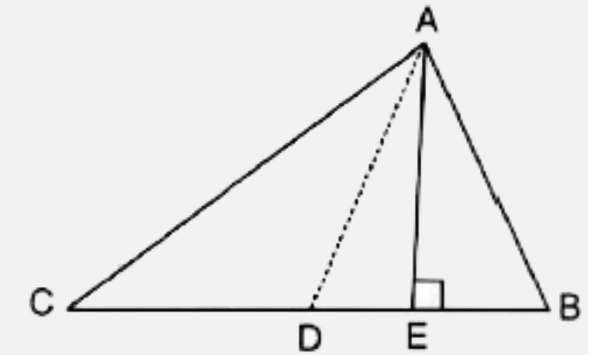
2. The following figures shows a triangle ABC in which AD is median and $AE \perp BC$.

Prove that : $2AB^2 + 2AC^2 = 4AD^2 + BC^2$



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3. In triangles ABC , AD is perpendicular to BC and $AD^2 = BD \times DC$. Prove that angle $BAC = 90^\circ$

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4. In triangle ABC, $\angle ABC - 90^\circ$, $AB = 2a + 1$ and $BC = 2a^2 + 2a$. Find AC in terms of 'a' if a= 8 , find the lengths of the sides of the triangles.

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5. In a right angled triangle, five times the square on the hypotenuse is equal to four times the sum of the squares on the medians drawn from the acute angles. Prove it.

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Rectilinear Figures

1. In parallelogram ABCD , AB = (3x- 4) cm, BC = (y- 1) cm , CD = (y+ 5) cm and AD = (2x+ 5) cm. find the ratio AB : BC.

Find the values of x and y.

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2. Alternate sides of a hexagon are produced to meet so as to form a star-shaped figure. Show that the sum of a angles at vertices of the star is equal to 4-right angles.

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3. Find the numbers of sides of a polygon whose number of diagonals is

5

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4. Find the numbers of sides of a polygon whose number of diagonals is

14

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5. Find the numbers of sides of a polygon whose number of diagonals is

27

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6. Each interior angle of a regular plygon is 144° . Find the interior angle of a regular polygon which has double the number of sides as the first polygon.

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Constructions Of Polygons

1. In a octagon, four of the angles are equal and each of the others is 20° more than each of the first four. Find the angles of the octagon.

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2. Construct a quadrilateral ABCD in which AB = 4.5 cm , BC = 3.8 cm $\angle BCD = 90^\circ \angle BAD = 60^\circ$ and $\angle ABC = 120^\circ$

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3. Contruct a rhombus ABCD in which AB = 4.7 cm and AC = 6.2 cm.

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4. Construct a parallelogram ABCD in which AC = 6.5 cm , BD = 7 cm , diagonals AC and BD intersects each other at angle 45°

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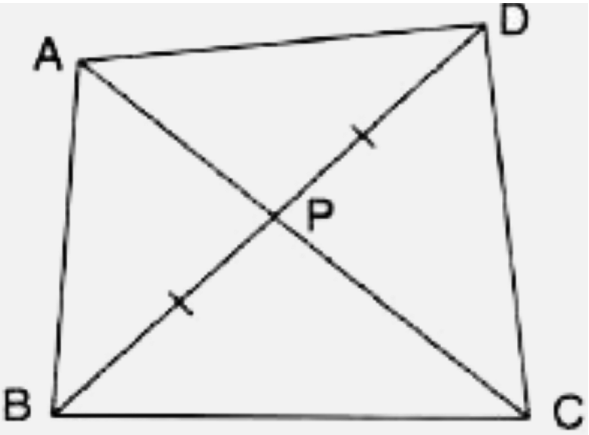
Area

1. In quadrilateral ABCD, diagonal BD is bisected by the diagonal AC. Prove that : ΔABC and ΔADC are equal in area.



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2. In ΔABC, E is mid-point of side AB and EBCD is a parallelogram. If the area of ΔABC is 80 cm, find the area of parallelogram EBCD.

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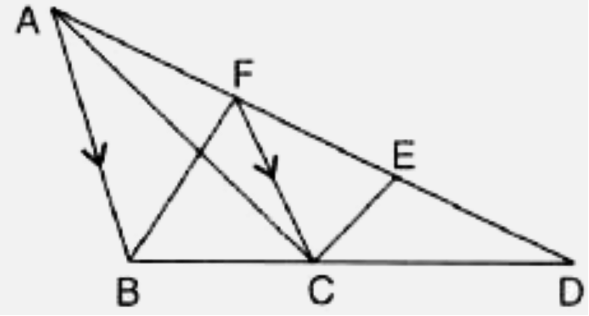
3. In the following figure, F and E are points on the side AD of the triangle ABD. Through F a line is drawn parallel to AB to meet BD at point C .

Prove that : ar (ΔACE) = ar (quad . BCEF)



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4. Any point D is taken on the side BC of a ΔABC and AD is produced to E such that AD = DE , prove that area of $\Delta BCE =$ area of ΔABC,

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5. ABC is an equilateral triangle. Taking BC as the base, construct a right angled triangle equal in area to equilateral triangle ABC.

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Circle

1. If arcs AXB and CYD of a circle are congruent, find the ratio of AB and CD.

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2. In a circle of radius 5 cm, PQ and RS are two parallel chords of lengths 8 cm and 6 cm respectively. Calculate the distance between the chords if they are on:

the same side of the centre.

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3. In a circle of radius 5 cm, PQ and RS are two parallel chords of lengths 8 cm and 6 cm respectively. Calculate the distance between the chords if they are on:

opposite sides of the centre.

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4. AB and CD are two chords such that AB = 10 cm , CD = 24 cm and AB // CD The distance between the chords is 17 cm . Find the radius of the circle.

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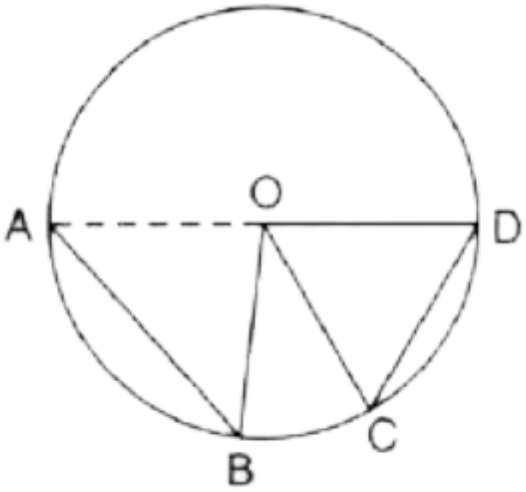
5. In circle given below . O is its centre and lengths of chords AB and CD are in the ratio 5 :3

If angle AOB = 100°, find :

(i)$\angle COD$



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6. A chord CD of a circle, with centre o, is bisected by the diameter AB at point P. If OA = OB = 30 cm and OP = 18 cm, calcualte : `

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7. If two equal chords of a circle intersect within the circle, prove that the segments of one chord are equal to corresponding segments of the other chord.

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Statistics

1. Construct a cumulative frequency distribution table from the following frequency table :

C.I	Frequency
$11-20$	15
$21-30$	21
$31-40$	26
$41-50$	18
$51-60$	13
$61-70$	15

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2. Construct a frequency distributions table from the following cumulatvive frequency table.

Class interval	Cumulative Frequency
$0-9$	15
$10-19$	23
$20-29$	38
$30-39$	56
$40-49$	68
$50-59$	90

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3. Determine whether the given values of x are zeroes of the given polynomial or not: $x^2+6x+5; x=-1, x=-5$

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4. If $x\tan 45^\circ \sin 30^\circ = \cos 30^\circ \tan 30^\circ$, then x is equal to

A. $\sqrt{3}$

B. $\frac{\sqrt{3}}{2}$

C. 0

D. 1

Answer:

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5. sin 2B = 2 sin B is true when B is equal to

A. 90°

B. 60°

C. 45°

D. 0°

Answer:

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Mean And Median

1. Find the mean of the following numbers.

16 14 12 8 23 26

18 20 23 9 11 22

27 18 and 20

State the value of the mean when each of these numbers is :

(i) increased by 4.

(ii) decreased by 6.

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2. Find the median of :

14 20 8 17 25 27

20 16 25 0 5 19

17 30 and 6

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3. The mean weigth of 30 students of a class is 60.2kg . Two students of weights of 50 kg and 67 kg left the class . Find the mean weight of the remaining students

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4. Find the mean and median of first 10 multiple of 3 between 0 and 60.

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Area And Perimeter Of Plane Figures

1. The sides of right-angled triangle containing the right angle are 5x cm and (3x- 1) cm. Calculate the lengths of the hypotenuse of the triangle. If its area is 60 cm^2

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2. The perimeter of an isosceles triangle is 40 cm. The base is two-third of the sum of equal sides. Find the length of each equal side.

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3. The following figures shows a right - angled triangle ABC with $\angle B = 90^\circ$, $AB = 15$ cm and AC = 25 cm. D is a point in side BC and CD = 7 cm. if De $\perp AC$, find the length of DE.

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4. The parallel sides of an isosceles trapezium are in the ratio 2 : 3. If its height is 8 cm and area is 240 cm^2 find its perimeter.

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5. Find the area (correct to three significant digits) of quadrilateral ABCD with angle BCA = 90°, AB = 26 cm and ACD as an equilateral triangle of side 24 cm.

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6. The lengths of the diagonals of a rhombus are 60 cm and 80 cm. Find the perpendicular distance between the opposite sides of rhombus.

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7. The base and the altitude of triangular metal disc are 66 cm and 28 cm respectively. By drilling a circular hole through this metal disc, its area is reduced to one-third. Find the diameter of the hole. (Take only one side of the disc into consideration)

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8. Three concentric circles have radii x cm, 10 cm and 5 cm such that $x > 10 > 5$. If the area enclosed by circles with radii x cm and 10 cm is the same as the area enclosed by the circles with radii 10 cm and 5 cm, find the area of the largest circle.

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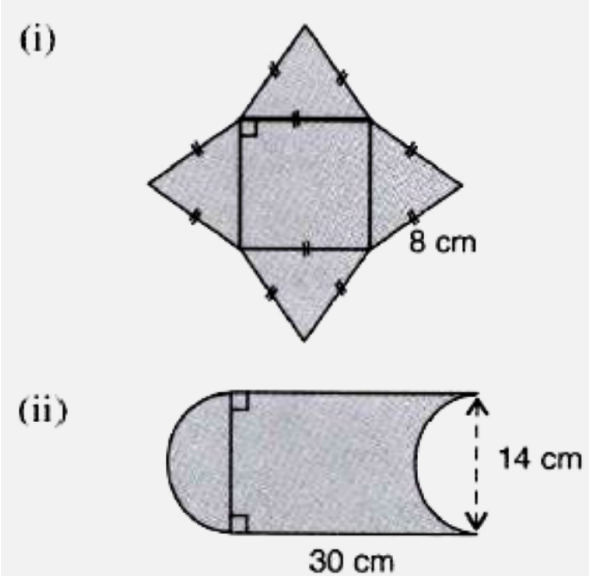
9. Find the area and the perimeter of the shaded part of following figure.



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Solids

1. The sum of the length, breadth and height of a cuboid is 38 cm and the length of its diagonal is 22 cm. Find the surface area of the cuboid.

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2. A wall 24 m long, 5 m high and 0-25 m thick is to be constructed using bricks each measuring $25cm \times 12.5cm \times 7.5cm$. Find the number of bricks required, if 5% of the wall is occupied by cement and sand mixture.

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3. The internal dimensions of a box are 1.2 m. 80 cm and 50 cm. How many cubes each of edge 7 cm can

be packed in the box with faces parallel to the sides of the box. Also, find the space left empty in the box.

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4. The internal dimensions of a box are 1.2 m 80 cm and 50 cm. How many cubes each of edge 7 cm can be packed in the box with faces parallel to the sides of the box.

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5. A small indoor greenhouse (herbarium) is made entirely of glass panes (including base) held together with tape. It is 30 cm long, 25 cm wide and 25 cm high. (i) What is the area of the glass? (ii) How much of tape is needed for all the 12 edges?

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6. A river 3 m deep and 40 m wide is flowing at the rate of 2 km per hour. How much water will fall into the sea in a minute?

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Trigonometry

1. In $\Delta ABC, \angle C = 90^\circ, AB = 20$ and $BC = 12$. D is a point in side AC such that CD = 9 Taking angle BDC = x, find

$\sin\angle ABC$

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2. In $\Delta ABC, \angle C = 90^\circ, AB = 20$ and $BC = 12$. D is a point in side AC such that CD = 9 Taking angle BDC

= x, find

$\tan x - \cos x + 3 \sin x.$

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3. If $\cos \theta = \frac{2\sqrt{mn}}{m+n}$, find the value of $\sin \theta$ (given m > n)

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4. In triangle ABC , $\angle B = 90^\circ, AB = 40, AC + BC = 80,$ Find :

sin A

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5. In triangle ABC , $\angle B = 90^\circ, AB = 40, AC + BC = 80,$ Find :

cos A

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6. In triangle ABC , $\angle B = 90^\circ, AB = 40, AC + BC = 80,$ Find :

tan C .

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7. If $A = 30^\circ$ then show that

$$\sin(60^\circ + A) - \sin(60^\circ - A) = \sin A$$

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8. If $A = 30^\circ$ then show that

$$\sin(A + 30^\circ) + \cos(A + 60^\circ) = \cos A$$

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9. If x= 20° Evaluate :

$$12 \sin \frac{3x}{2} \cos 3x + 5 \tan(2x + 5^\circ) - 3 \cot^2 3x.$$

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10. If $\cot 3x = \sin 45^\circ \cos 45^\circ + \cos 60^\circ$, find the value of x between 0° and 90°

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11. If $2\cos^2\theta + \sin\theta - 2 = 0$ and $0^\circ \leq \theta \leq 90^\circ$ find the value of θ.

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12. In ΔABC, $\angle B = 90^\circ$ find the values of :

$\sin A \cos C + \cos A \sin C$

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13. In ΔABC, $\angle B = 90^\circ$ find the values of :

$\cos A \cos C - \sin A \sin C$

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14. In an isosceles triangle ABC.

AB = BC = 10 cm and BC = 18 cm .

Find the value of :

$\sin^2 B + \cos^2 C$

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15. In an isosceles triangle ABC.

AB = BC = 10 cm and BC = 18 cm .

Find the value of :

$\tan^2 C - \sec^2 B + 2$

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16. In Triangle ABC, AD is perpendicular to BC, $\tan B = \frac{3}{4} \tan C = \frac{5}{12}$ and BC = 56 cm . Calculate the lengths of AD.

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17. A balloon is connected to a meteorological station by a cable of length 200 m inclined to the horizontal at an angle of 60°. Determine the height of the balloon from the ground. Assume that there is no slack in a cable. [Take $\sqrt{3} = 1.73$).

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18. ABCD is an isosceles trapezium with AB parallel to DC, AD = BC = 12 cm, $\angle A = 60^\circ$ and $DC = 16cm$. Taking $\sqrt{3} = 1.732$, find

length of side AB.

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19. ABCD is an isosceles trapezium with AB parallel to DC, AD = BC = 12 cm, $\angle A = 60^\circ$ and $DC = 16cm$. Taking $\sqrt{3} = 1.732$, find

area of trapezium ABCD.

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20. If A,B,C are angles of a triangle, prove that

$$\tan\ \frac{B+C}{2} = \cot\frac{A}{2}.$$

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21. If $A + B = 90^\circ$, show that :

$$\cos A = \sqrt{\frac{\cos A}{\sin B} - \sin A \cos B}$$

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22. Prove that :

$\tan(55^\circ + x) = \cot(35^\circ - x)$

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23. Prove that :

$\sec(70^\circ - 0) = \cos ec(20^\circ + 0)$

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24. Prove that :

$\sin(28^\circ + A) = \cos(62^\circ - A)$

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25. Prove that :

$$\frac{\sin\theta\cos\left(90^0-\theta\right)\cos\theta}{\sin\left(90^0-\theta\right)}+\frac{\cos\theta\sin\left(90^0-\theta\right)\sin\theta}{\cos\left(90^0-\theta\right)}=1$$

`

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26. If $\tan 2\theta=\cot(\theta+6^\circ)$, where 2θ and $\theta+6^\circ$ are acute angles, find the value of θ .

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27. If in ΔABC, $\angle C = 90^\circ$, prove that :

$$\sqrt{\frac{1-\sin A}{1+\cos B}} = \sec A - \cot B$$

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28. Solve for $\theta (0^\circ < \theta < 90^\circ)$

$$2\sin^2\theta = \frac{1}{2}$$

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29. Solve for $\theta (0^\circ < \theta < 90^\circ)$

$$2\cos 3\theta = 1$$

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30. If $\operatorname{cosec}\theta = \sqrt{2}$, find the value of :

$$\frac{1}{\tan A} + \frac{\sin A}{1 + \cos A}$$

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31. If $2\cos\theta = \sqrt{3}$. prove that :

$$3\sin\theta - 4\sin^3\theta = 1$$

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32. Given A is an acute angle and

13 sin A = 5 , evaluate :

$$\frac{5\sin A - 2\cos A}{\tan A}$$

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33. Prove that $\cos 30^\circ = \frac{\sqrt{3}}{2}$

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34. If $\sin\theta = \cos\theta$ find the value of :

$3\tan^2\theta + 2\sin^2\theta - 1$

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35. IF cos $B = \frac{3}{\sqrt{13}}$ and A + B = 90° find the value of sin A .

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36. Two opposite angles of a rhombus are 60° each. If the length of each side of the rhombus is 8 cm, find the lengths of the diagonals of the rhombus.

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Co Ordinate Geometry

1. Three vertices of a parallelogram ABCD are A = (-2, 2), B = (6, 2) and C = (4.-3). Plot these points on a graph paper and hence use it to find the co ordinates of the fourth vertex D. Also, find the co-ordinates of the mid point of the side CD.

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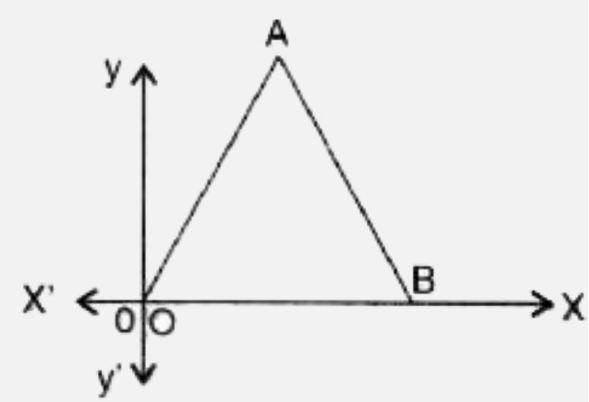
2. The given figure shows an equilateral triangle OAB.

If AB =2a units , find the co-ordinates of the vetices.



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3. Show that the lines y=-x bisects the angle X'OY

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4. Draw the line $\frac{x}{3}+\frac{y}{4}=1$

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5. Find the slope and the y- intercept of the line:

$$\frac{x}{3} - \frac{y}{5} = 1$$

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6. Find the slope and the y- intercept of the line:

$$\frac{2x}{5} + \frac{3y}{4} = 1$$

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Graphical Solution

1. Solve graphically:

$3y + 5x = 0$ and $5y + 2x = 0$

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2. Solve graphically:

$2x + 2y - 3 = 0$ and $x + 2y + 1 = 0$

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3. Draw the graph of 2x - 3y + 6 = 0. Hence, find the co-ordinates of points where the graph drawn

meets the co-ordinate axes.

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Distance Formula

1. Find distance between the points A (a,b) and B(- b,a)

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2. Find the distance between the origin and $(3\sqrt{5}, -2)$

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3. Show that the quadrilateral ABCD with A(3,1) ,B(0,-2),C(1,1) and D(4,4) parallelogram.

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4. Find the distance between the points (-2,-2) and (1, 0) correct to 3 significant figures.

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5. The circle with centre (x, y) passes through the points (3, 11), (14, 0) and (12, 8). Find the values of x and y.

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6. AB is a diameter of a circle with centre C = (-2, 5). If A = (3, -7). Find

the length of radius AC

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7. AB is a diameter of a circle with centre C = (-2, 5). If A = (3, -7). Find

the coordinates of B.

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8. Find all possible values of a for which the distance between the points A(a, -1) and B(5, 3) is 5 unit.

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9. Find the point on x-axis which is equidistant from the points $(-2, 5)$ and $(2, -3)$.

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10. Show that the points $(1, -1), (5, 2)$ and $99, 5)$ are collinear.

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11. Show that the points A(2, 1), B(5, 2). C(6, 4) and D(3, 3) are vertices of a parallelogram. Is this figure

a rectangle?

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