GOVERNMENT URDU HIGH SCHOOL YELLAGONDAPALYA

SUBJECT: MATHEMATICS 2019 – 20

SUMMATIVE ASSESMENT - 1

Class : 9th ***Marks:40***

I. Answer the following [mcq] *1 x 4 = 4*

1. A number 's' is called irrational, if it cannot be written in the form of ---------- where p and q are integers and $q \neq 0$

A] $\frac{p}{q}$ B] $\frac{q}{p}$ C] p = q D] p – q

2. The degree of a non – zero polynomial is -----

A] 0 B] 1 C] ±1 D] 2

3. If in a quadrilateral, each pair of opposite angles is equal, then it is a ----------

A] parallelogram B] Trapezium C] Square D] Rhombus

4. Two triangles are congruent if any two pairs of angles and one pair of corresponding sides Are equal.we may call it as –

A] AAS Congruence Rule B] ASA Congruence Rule C] SAS Congruence Rule D] SSS Rule

5. Show that 3.142678 is a rational number. In other words, express 3.142678 in the form $\frac{p}{q}$, where p and q are integers and q = 0 *1 x 11 = 11*

6. Find the value of k, if x – 1 is a factor of $4x^2 - 3x + k$

7. What is the name of horizontal and the vertical lines drawn to determine the position of any point in the Cartesian plane.

8. Name any three types of angles

9. Define a quadrilateral .

10. Write the following in decimal form and say what kind of decimal expansion

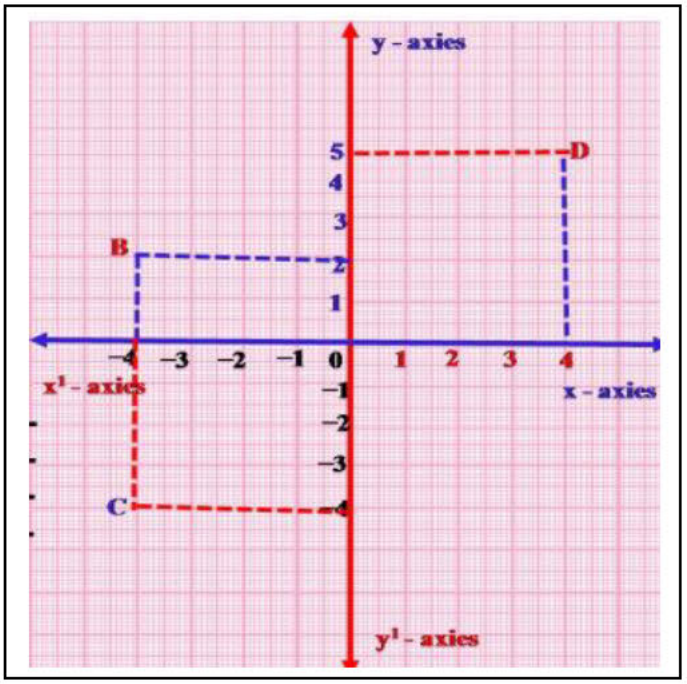
[1] $\frac{36}{100}$ [2] $\frac{1}{11}$

11. Simplify : $(\sqrt{11} - \sqrt{7})(\sqrt{11} + \sqrt{7})$

12. Find the degree of the polynomial: $2 - y^2 - y^3 + 2y^8$

13. Write three numbers whose decimal expansion are non-terminating non – recurring.

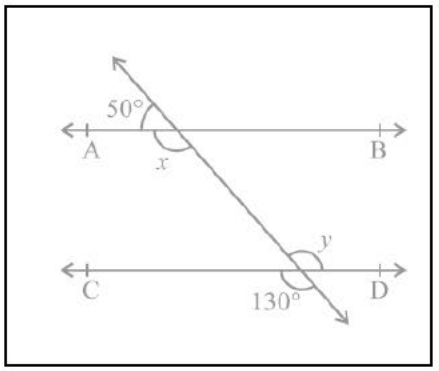
14. See the figure and write :the co-ordinates of B



and Both C and D

15. Write the Euclid's postulates numbers:

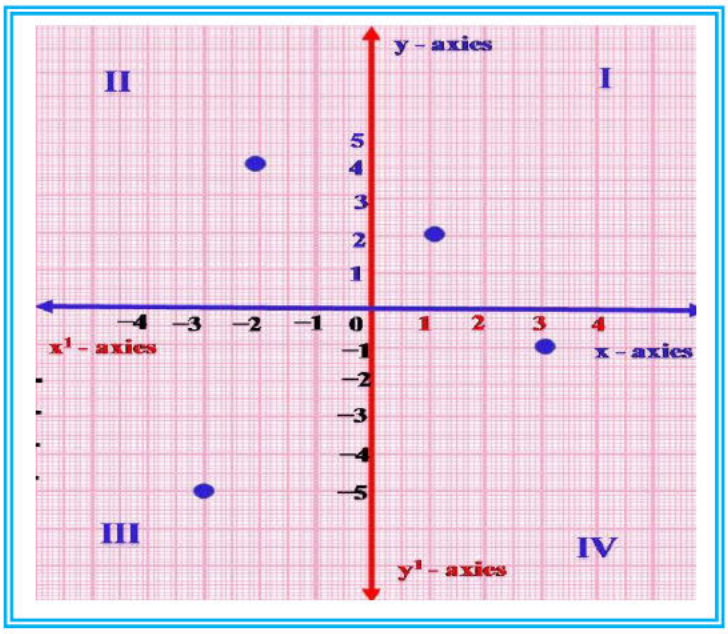
16. In the fig find the values of x and y then show that ***2 x 7 = 14***



AB ∥ CD

17. You know that $\frac{1}{7} = 0.\overrightarrow{142857}$ ***can you predict what the decimal expansion of*** $\frac{2}{7}, \frac{3}{7}, \frac{4}{7}, \frac{5}{7}, \frac{6}{7},$

18. Rationalise the denominator $\frac{1}{\sqrt{7}-\sqrt{6}}$



19. In which quadrant or on which axis do each of the points

(- 2 , 4), (3, - 1) (- 1 , 0) (1, 2)lie?

Verify your answer by locating, Them on the Cartesian plane.

20. ABC is an isosceles triangle with AB = AC .

Draw AP ⊥ BC to show that $\angle B = \angle C$

21. Divide the polynomial $P(x) = x^3 + 4x^2 - 5x + 6$ ***is divided by*** $g(x) = x + 1$

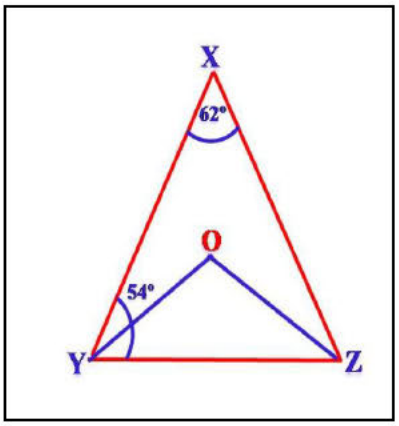
22 . Expand : $(2a - 3b - 5c)^2$ **. OR using identity** $(999)^3$

23. In an isoceles triangle ABC with AB = AC, D and E are points on BC such that BE = CD. **3 x *1 = 3***

Show that AD = AE **OR** **23[a]** ***24.*****Factorize :** $x^3 - 23x^2 + 142x - 120$.

24. Verify that $x^3 + y^3 + z^3 - 3xyz = \frac{1}{2}(x + y + z)[(x - y)^2 + (y - z)^2 + (z - x)^2]$ **4 x *2 = 8***

OR



24[a] In the fig =∠ *X = 62°, =∠XYZ = 54°. If YO and ZO are the bisectors of ∠XYZ and =∠XZY Respectively of ΔXYZ, find ∠OZY and ∠YOZ.*

25. Prove that,Angles opposite to equal sides of an isosceles triangle are equal.

OR

25[a] Show that the diagonals of a rhombus are perpendicular to each other.

SUMMATIVE ASSESMENT - 1 MATHEMATICS 2019-20 ***Time: 90m***

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where p and q are integers and q = 0

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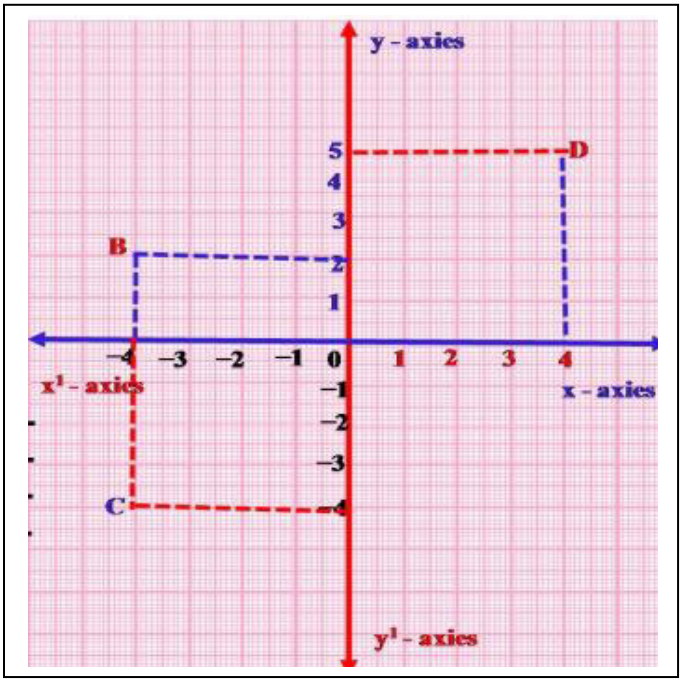

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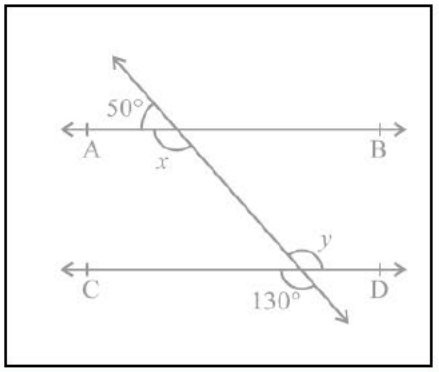

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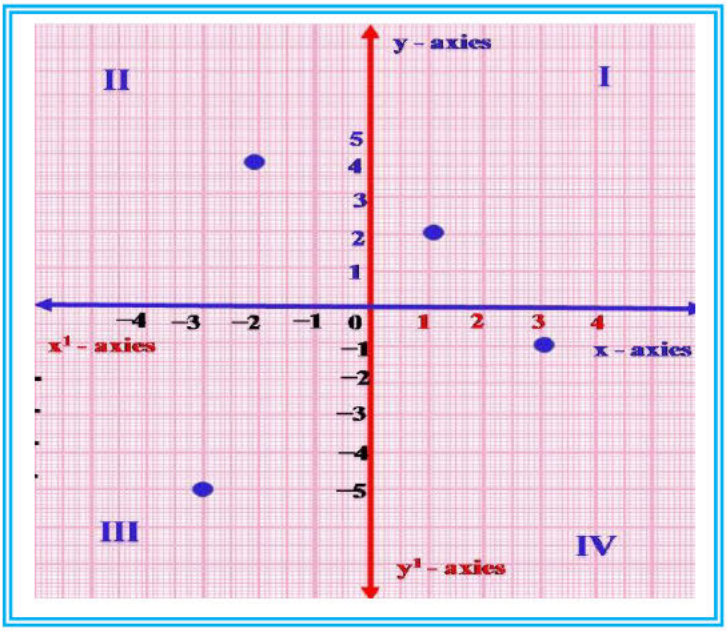

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on BC such that BE = CD. Show that AD = AE

OR 23[a] ***24.*****Factorize :** $x^3 - 23x^2 + 142x - 120$.

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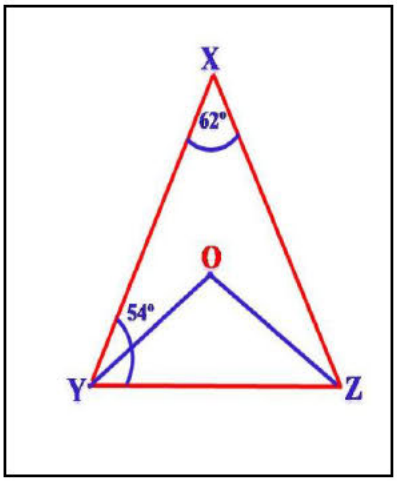

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KEY PAPER

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II. Answer the following: *1* x *11 = 11*

5. Show that 3.142678 is a rational number. In other words, express 3.142678 in the form $\frac{p}{q}$,

where p and q are integers and q = 0

Ans: we have 3.142678 = $\frac{3.142678}{1000000}$, and hence is a rational number.

6. Find the value of k, if x – 1 is a factor of $4x^2 - 3x + k$

Ans: As x – 1 is a factor of p(x) = $4x^2 - 3x + k$, p(1) = 0

$$P(1) = 4(1)^2 - 3(1) + k$$

$$4 - 3 + k = 0$$

$$\text{i.e.,} \quad K = -1$$

7. What is the name of horizontal and the vertical lines drawn to determine the position of any point in the Cartesian plane.

Solution: x – axis and y – axis

8. Name any three types of angles

Solution: Acute angle , right angle obtuse angle , straight angle and reflex angle.

9. Define a quadrilateral .

Solution: A quadrilateral has four sides, four angles and four vertices.

10. Write the following in decimal form and say what kind of decimal expansion

[1] $\frac{36}{100}$ **[2]** $\frac{1}{11}$

Solution: [1] 0.36 , terminating [2] 0.09 , recurring non – terminating.

11. Simplify : $(\sqrt{11} - \sqrt{7})(\sqrt{11} + \sqrt{7})$

Solution : $(\sqrt{11} - \sqrt{7})(\sqrt{11} + \sqrt{7}) = (\sqrt{11})2 - (\sqrt{7})2 = 11 - 7 = 4$

12. Find the degree of the polynomial: $2 - y^2 - y^3 + 2y^8$

Solution : The highest power of the variable is 8 . So, the degree of the polynomial is 8.

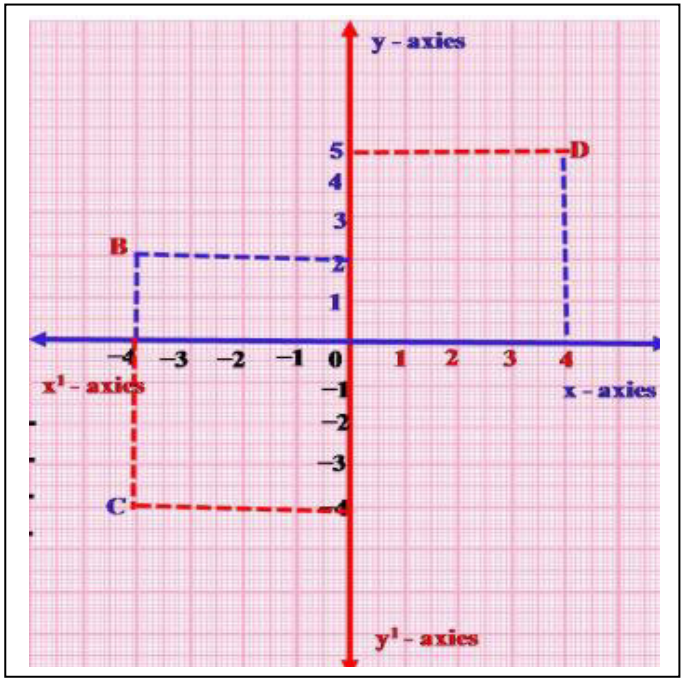
13. Write three numbers whose decimal expansion are non-terminating non – recurring .

Solution : 7.314114111411114

0 . 101002000300004

π **= 3.1416.....**

14. See the figure and write :the co-ordinates of B and C,D



Solution: B = (− 4 , 2) C= (− 4 , − 4) D = (5,4 ,)

15. Write the Euclid's postulates numbers:

[a] A circle can be drawn with any centre and any radius Postulate No ----------

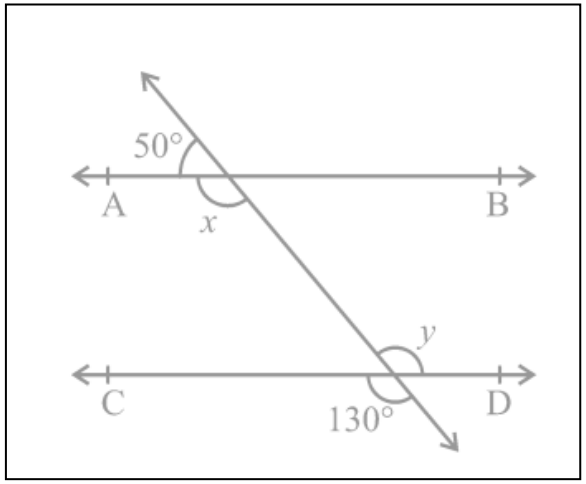
[b] All right angles are equal to one another Postulate No ----------

Solution:

[a] A circle can be drawn with any centre and any radius Postulate No 3

[b] All right angles are equal to one another Postulate No 4

16. In the fig find the values of x and y then show that $2 \times 7 = 14$



AB ∥ CD

Solution: In the given figure, a transversal intersects two lines AB and CD

Such that $x + 50° = 180°$ ***[linear pair axiom]***

$\Rightarrow x = 180° - 50°$

$x = 130°$ $y = 130°$ ***[vertically opposite angles***

therefore $\angle x = \angle y = 130°$ ***[Alternate angles]***

∴ AB ∥ CD [converse of alternate angles axiom] Proved.

17 .You know that $\frac{1}{7} = 0.\overrightarrow{142857}$ ***can you predict what the decimal expansion of*** $\frac{2}{7}, \frac{3}{7}, \frac{4}{7}, \frac{5}{7}, \frac{6}{7},$

Solution: $\frac{2}{7} = 2 \times \frac{1}{7} = 0.\overrightarrow{285714}$, $\frac{3}{7} = 3 \times \frac{1}{7} = 0.\overrightarrow{428571}$, $\frac{4}{7} = 4 \times \frac{1}{7} = 0.\overrightarrow{571428}$, , $\frac{5}{7} = 5 \times \frac{1}{7} = 0.\overrightarrow{714285}$

18. Rationalise the denominator $\frac{1}{\sqrt{7}-\sqrt{6}}$

Solution: $\frac{1}{\sqrt{7}-\sqrt{6}} \times \frac{\sqrt{7}+\sqrt{6}}{\sqrt{7}+\sqrt{6}} = \frac{\sqrt{7}+\sqrt{6}}{7-6} = \sqrt{7}-\sqrt{6}$

19. In which quadrant or on which axis do each of the points

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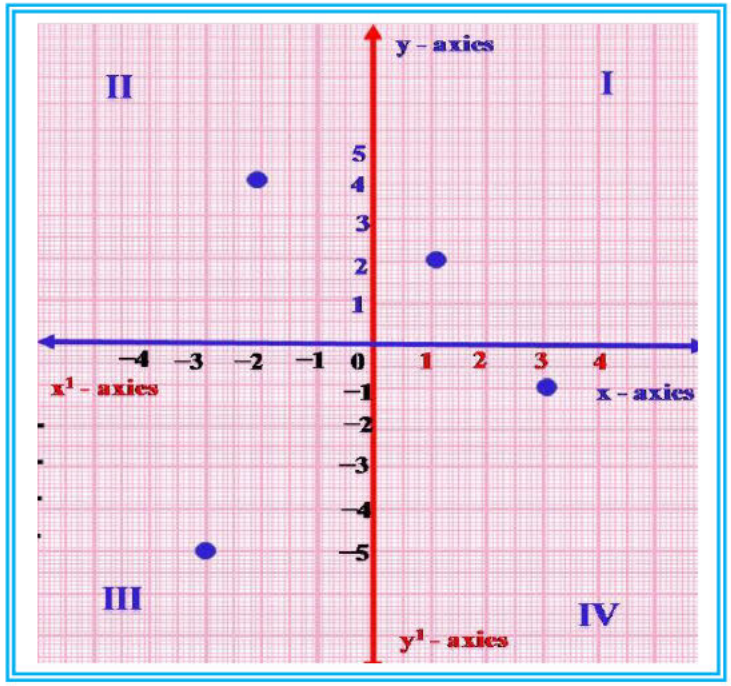
Verify your answer by locating, Them on the Cartesian plane.



Solution:

(- 2 , 4) : 2^{nd} quadrant

(3 , - 1) : 4^{th} quadrant

(1, 2) : 1^{st} quadrant

(− 3 , −5) : 4^{th} quadrant

20. ABC is an isosceles triangle with AB = AC . Draw AP ⊥ BC to show that $\angle B = \angle C$

Solution : Draw AP ⊥ BC

In ΔABP and ΔACP, we have AB = AC [Given]

$\angle APB = \angle APC$ [each 90°] **$\Rightarrow$** ***AB = AP [common]*** **$\Rightarrow \therefore$ ΔABP $\cong$ ΔACP [by RHS congruence rule]**

Also ***$\angle B = \angle C$ Proved [CPCT] = Corresponding part of congruent triangles.***

21. Divide the polynomial $P(x) = x^3 + 4x^2 - 5x + 6$ is divided by $g(x) = x + 1$

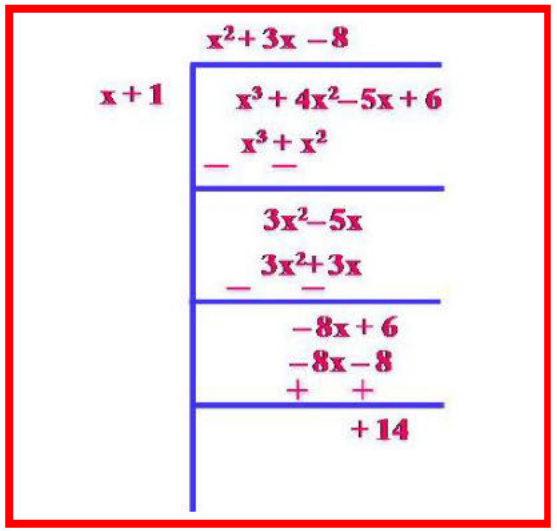
Solution: Here, the remainder is 14 now the zero of x + 1 is −1 so

Putting x = −1

$P(-1) = (-1)^3 + 4(-1)^2 - 5(-1) + 6$

$= -1 + 4 + 5 + 6$

$= 14$ is the remainder.



22] . Expand : $(2a - 3b - 5c)^2$. OR using identity $(999)^3$

Solution:

$(a - b - c)^2 = a^2 - b^2 - c^2 - 2ab - 2bc - 2ca$

$(2a - 3b - 5c)^2 = (2a)^2 - (3b)^2 - (5c)^2 - 2(2a)(3b) - 2(5c)(3b) - 2(5c)(2a)$

$= 4a^2 - 9b^2 - 25c^2 - 12ab - 30bc - 20ca$

OR using identity $(999)^3$

$(999)^3 = (1000 - 1)^3$

$= (1000)^3 - (1)^3 + 3(1000)(1)(1000 - 1)$

$= 1000000 + 64 + 124800$

$= 1124864$

23] In an isoceles triangle ABC with AB = AC, D and E are points on BC such that BE = CD. Show that AD = AE

Solution : In an Δ ABD and Δ ACE,

AB = AC [Given] ---------- 1

∠B = ∠C [Angles opposite to equal sides] ----------2

Also , BE = CD

So BE – DE = CD – DE

That is BD = CE ----------3

So Δ ABD ≅ Δ ACE,

(Using (1) (2) (3) and SAS rule) this gives

AD = AE [CPCT]

***24.*Factorize : $x^3 - 23x^2 + 142x - 120$.**

Solution: Let $p(x) = x^3 - 23x^2 + 142x - 120$.

We shall look for all the factors of −120 some of these are ±1, ±2, ±3, ±4, ±5, ±6, ±8, ±10, ±12, ±15, ±20, ±24, ±20, ±30, ±60, By trial we find that p(1) =0
So x – 1 is a factor of p(x) Now we see that

$x^3 - 23x^2 + 142x - 120 = x^3 - x^2 - 22x^2 + 22x + 120x - 120$
$= x^2(x - 1) - 22x(x - 1) + 120(x - 1)$ (why?)
$= (x - 1)(x^2 - 22x + 120)$ [Taking (x – 1) common]
We could have also got this by dividing p(x) by x – 1.
Now $x^2 - 22x + 120$ can be factorised either by splitting the middle term or by using the factor theorem. By splitting the middle term we have:

$x^2 - 22x + 120 = x^2 - 12x - 10x + 120$
$= x(x - 12) - 10(x - 12)$
$= (x - 12)(x - 10)$
$x^3 - 23x^2 + 142x - 120 = (x - 1)(x - 10)(x - 12)$

25. Prove that, Angles opposite to equal sides of an isosceles triangle are equal.

OR page 94

25[a] Show that the diagonals of a rhombus are perpendicular to each other.

Page 124.

Theorem 5.2 : *Angles opposite to equal sides of an isosceles triangle are equal.*

This result can be proved in many ways. One of the proofs is given here.

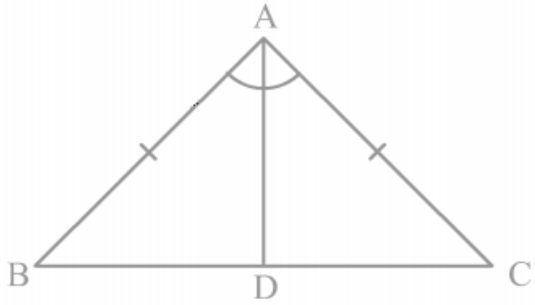


Fig. 5.25

Proof : We are given an isosceles triangle ABC in which AB = AC. We need to prove that $\angle B = \angle C$.

Let us draw the bisector of $\angle A$ and let D be the point of intersection of this bisector of $\angle A$ and BC (see Fig. 5.25).

In ΔBAD and ΔCAD,

$AB = AC$ (Given)

$\angle BAD = \angle CAD$ (By construction)

$AD = AD$ (Common)

So, $\Delta BAD \cong \Delta CAD$ (By SAS rule)

So, $\angle ABD = \angle ACD$, since they are corresponding angles of congruent triangles.

So, $\angle B = \angle C$

Example 2 : Show that the diagonals of a rhombus are perpendicular to each other.

Solution : Consider the rhombus ABCD (see Fig. 7.13).

You know that AB = BC = CD = DA (Why?)

Now, in Δ AOD and Δ COD,

OA = OC (Diagonals of a parallelogram bisect each other)

OD = OD (Common)

AD = CD

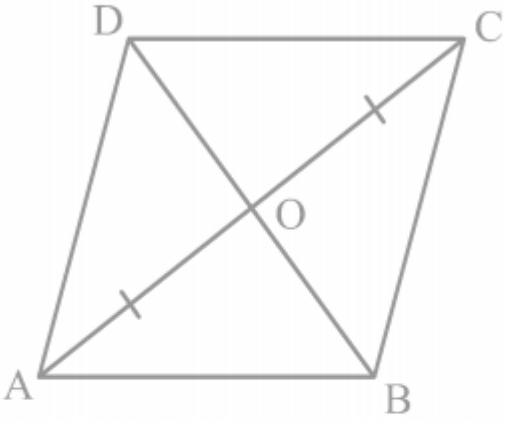


Fig. 7.13

Therefore, Δ AOD ≅ Δ COD (SSS congruence rule)

This gives, ∠ AOD = ∠ COD (CPCT)

But, ∠ AOD + ∠ COD = 180° (Linear pair)

So, 2∠ AOD = 180°

or, ∠ AOD = 90°

So, the diagonals of a rhombus are perpendicular to each other.