Octahedral classes, kharadi

2nd floor, yashwant plaza, near bank of India,

CLASS 09 - MATHEMATICS

Polynomials and Area theorem

Time Allowed: 1 hour and 30 minutes **Maximum Marks: 50**

Section A

1. Answer the following **[10]**

   a) Write the coefficient of x^2 in (x - 1)(3x - 4).

   b) Write the coefficient of x^2 in (2x - 5)($2x^2$ - 3x + 1).

   c) Classify as linear, quadratic and cubic polynomials:
   $y + y^2 + 4$

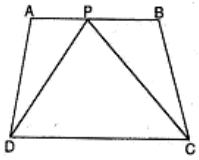
   d) Find the value of f(x) = $2x^2$ + 7x + 3 at x = -2.

   e) Expand $\left[\frac{2}{3}x + 1\right]^3$

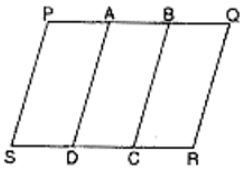
   f) Factories $x^2 + y - xy - x$

   g) Write the coefficient of x^2 in the expansion of $(x - 2)^3$.

   h) Is the given figure lie on the same base and between a same parallels. In such a case, write the common base and the two parallels.



   i) Is the given figure lie on the same base and between the same parallels. In such a case, write common base and the two parallels:



   j) The diagonal of a square is 10 cm. Find its area.

2. Answer the following **[10]**

   a) Factorize the polynomial $x^3 + 8y^3 + 64z^3 - 24xyz$

   b) Factorise :27 - $125a^3$ - 135a + $225a^2$

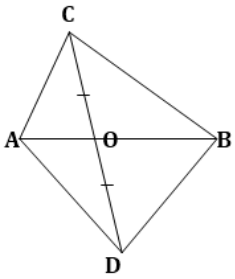
   c) Factorise: $a^3 - 2\sqrt{2b^3}$

   d) Expand: $(-x + 2y - 3z)^2$

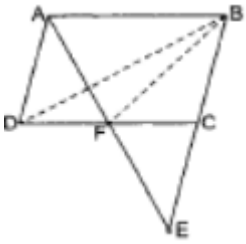
   e) Verify : $x^3 - y^3 = (x - y)(x^2 + xy + y^2)$

3. Answer the following **[15]**

   a) In figure, ABC and ABD are two triangles on the same base AB. If line-segment CD is bisected by AB at O, show that ar (ABC) = ar (ABD).

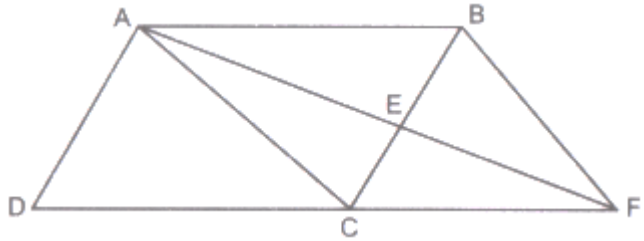


b) In given figure, ABCD is a parallelogram in which BC is produced to E such that CE = BC. AE intersects CD at F. If area of △BDF = 3 cm^2, find the area of parallelogram ABCD.

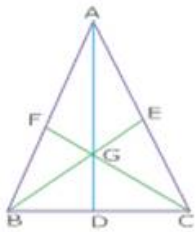


c) XY is a line parallel to side BC of a triangle ABC. BE || AC and CF || AB meet XY at E and F respectively. Prove that: ar(△ABE) = ar(△ACF)

d) A point E is taken on the side BC of a parallelogram ABCD. AE and DC are produced to meet at F. Prove that ar (Δ ADF) = ar (ABFC)



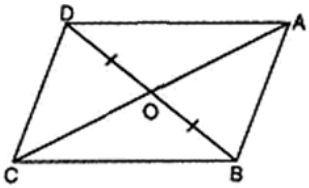
e) Show that ar $(\triangle ABG) = \frac{1}{3} ar\,(\triangle ABC)$,if median of △intersect at G.



4. Answer the following **[15]**

a) Find the values of m and n so that the polynomial $x^3 - mx^2 - 13x + n$ has x-1 and x+3 as factors.

b) In figure, diagonals AC and BD of quadrilateral ABCD intersect at O such that OB = OD.



If AB = CD, then show that :

i. ar(DOC) = ar(AOB)

ii. ar(DCB) = ar(ACB)

iii. DA || CB or ABCD is a parallelogram.

c) In figure, diagonals AC and BD of quadrilateral ABCD intersect at O such that OB = OD. If AB = CD, then show that:

i. ar (DOC) = ar (AOB)

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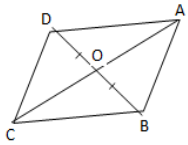
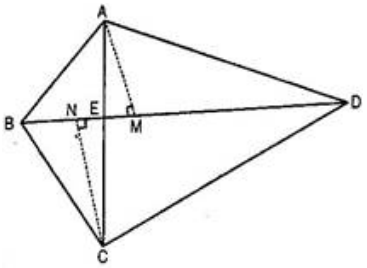
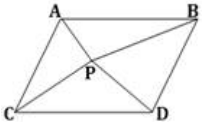


d) Diagonals AC and BD of a quadrilateral ABCD intersect each other at P. Show that:

$ar(APB) \times ar(CPD) = ar\,(APD) \times ar(BPC)$



e) In figure, P is a point in the interior of a parallelogram ABCD. Show that:



i. ar (APB) + ar (PCD) = $\frac{1}{2}$ar (ABCD)

ii. ar (APD) + ar (PBC) = ar (APB) + ar (PCD)