വിജയഭേരി

MALAPPURAM DISTRICT PANCHAYATH
EDUCATIONAL PROJECT

ഗണിതപത്രം

STATISTICS

1. Scores awarded to 9 students for one subjects are given below. Find the mean and median.
   15, 12, 25, 10, 3, 18, 17, 20, 6
2. Weights of 10 students school cricket club are given below. Find the mean and median.
   35,39,32,36,40,30,34,37,38,33
3. Daily wages of 9 workers in a factory are given below . Find the median. How many wages are greater than the median wage?
   2100, 3500, 2100, 2500, 2800, 4900, 2300,2200, 3300
4. Scores awarded to a student for seven subjects are given below. 33,23, 43, 34, x, 37, 40. If the median is 35, then what is the number 'x'?
5. Scores awarded to some students for one subjects are given below. Find the median.

   20,12,20,10,17,19,17,20,6,13
6. Write 7 numbers with their median 25.
7. First term of an arithmetic sequence is 10 and common difference 4.
   a) What is the 8^{th} term?
   b) What is the mean and median of first 15 terms of this sequence?
8. Sum of first 9 terms of an arithmetic sequence is 180.
   a) Find its 5^{th} term.
   b) Find the mean and median of first 9 terms of this sequence.
9. Find the mean and median of first 25 natuarl numbers.
10. Sum of first 10 terms of an arithmetic sequence is 200.
    a) What is the sum of 5^{th} and 6^{th} term of this sequence?
    b) Find the mean and median of first 10 terms of this sequence.
11. Monthly earnings of 25 households are given below.
    a) If the families are arranged according to the monthly incomes, which familie's earning is assumed as median?
    b) Find the median monthly earnings.

Monthly earning	4000	5000	6000	7000	8000
Number of families	3	7	8	6	1

12. The following table shows that classification of workers in a factory according to their daily wages

Daily wages	400	500	600	700	800
Number	2	4	5	7	3

    a) Howmany workers are there?
    b) Workers are arranged according to their wages, What is the wage of 11^{th} worker?
    c) What is the median wage?
13. The following table shows that classification of 26 families according to their monthly earnings.
    Find the median monthly earnings.

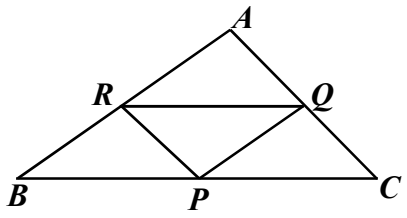
Monthly earnings	5000	6000	7000	8000	9000	10,000
No. of families :	6	7	4	4	3	2

POLYNOMIAL.

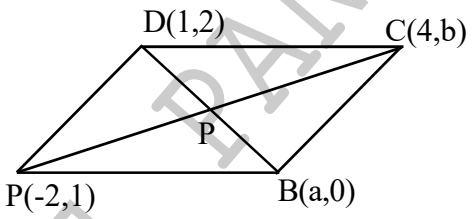
1 If $P(x)=2x^2-3x+1$ then
   a) Find P(0), P(1) and P(2).
   b) Write a first degree factor of P(x).
2. Check whether x-3 is a factor of the polinomial x^2-3x+4 , if not which number is added to P(x) for which x-3 is a factor?
3. In the polinomial P(x), P(1)=0, P(-2)=0 then write two first degree factor of P(x).
4. a)If $P(x) = x^2 +2x +5$ then, find P(1).
   b) If x-1 is a factor of $P(x) =x^2+2x+k$ then, what is the number 'k'?
5. Write the following polynomial as the product of two first degree polynomials.
   a) $x^2 - 1$ (b) $x^2 - 9$ (c) $x^2 - 4$ (d) $x^2 - 100$
   e) $x^2 + 6x + 8$ (f) $x^2 + 7x + 10$ (g) $x^2 - 7x + 10$ (h) $x^2 - 2x - 15$
6. a) $(x + 2)(x+3) = x^2 + 5x + 6$. What are the two first degree factors of $x^2 + 5x + 6$
   (b) If $(x+a)(x + b) = x^2 + 8x + 15$ find a and b.
   c) Write the polynomial $x^2 + 8x + 15$ as the product of two first degree polynomials.
7 If $P(x) = x^2 - 5x + 7$ then,
   a) Find P (3) , b) Find P (x) - P (3)
   c) Write P (x) - P (3) as the product of two first degree polynomials.
8. If P (x) - P (2) = $x^2 - 7x + 10$
   a) If x = 2 then, find P (x) - P (2).
   b)Write P (x) - P (2) as the product of two first degree polynomials.
9. a) If $P(x) = x^2 - 7x + 13$ then, find P (3)
   b)Find P (x) - P (3) .
   c) Write P (x) - P (3) as the product of two first degree polynomials.
   d) What are the solutions of the equation P (x) - P (3) = 0 ?
10. $P(x) = 3x^2 - 5x + 7$, a) Find P (2)
    b) Find P (x) - P (2).
    c) Write P (x) - P (2) as the product of two first degree polynomials.
11. $P(x) = 2x^2 + x - 6$, a) Find P (-2)
    b) Find P (x) - P (-2)
    c) Write P (x) - P (-2) as the product of two first degree polynomials.
12. $P(x) = 4x^2 + 5x - 9$,
    a)Find P (2) .
    b) Which number should be added to P (x) for which x-2 as a factor?
    c) Write a polynomial for which x - 2 as a factor
13. a) $P(x) = x^2 - 7x + 11$, find P (3)
    b) Which number should be added to P (x) for which x-3 as a product ?
    c) Write the polynomial $x^2 - 7x + 12$ as the product of two first degree polynomial.
14. $P(x) = x^2 - 4x + 4$, If P (1) = 1 then,
    a)Re write P (x) for which x-1 is a factor P(x)
    b) Write P (x) = $x^2 - 4x + 3$ as the product of two first

GEOMETRY AND ALGEBRA

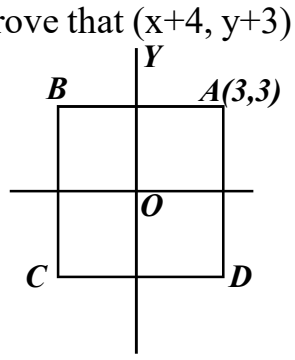
1. Find the coordinates of the mid point of the line joining the points (4,5), (10, 7).
2. A circle is drawn with the line joining the points (2, 3), (6,5) as diameter.
   a) What is the coordinates of centre of the circle?
   b) What is the radius of the circle?
3. A(1, 0), (B(6, 7), C(2, 5) are the vertices of a triangle.Find the coordinates of midpoints of the sides.
4. A(1, 1), B(7, 1), C(8, 6), D(2, 6) are the vertices of the quadrilateral ABCD.
   a) Find the coordinates of midpoints the diagonals
   b) Prove that ABCD is a parallelogram.
5. A(1, 2), B(7, 2), C(1,10) are the vertices of triangle ABC.
   a) Find the length of sides of triangle ABC.
   b) Find the coordinates circum centre.
   c) Find the perimeter of the triangle formed by joining the midpoints of the sides of triangle .
6. A circle is drawn with AB as diameter and centre (3,2). If A(5,2) then,
   a) Find the radius of the circle.
   b) What is the coordinates of the point B?
7. In the figure, P,Q,R are the midpoints of the sides triangle ABC. If P(3, -3), Q(8, -1), R(4, 1) and A(9, 3) then, find the coordinates of B and C.



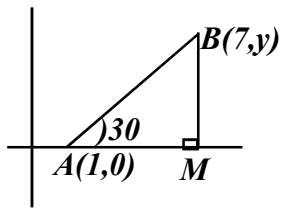
8. Write the coordinates endpoints of any diameter of the circle with centre as origin and radius 13units.
9. Diagonals of the parallelogram ABCD is meet at the point P. If A(2, 4), B(8, 6), P(6, 8) then, find the coordinates of the vertices C and D.
10. If A(-2, 3) and B(6, 9)
    a) What is the coordinates of centre of the circle with AB as diameter?
    b) Does the points C(-3, 5), D(5, -1) form a diameter of this circle?
11. In the figure, ABCD is a parallelogram and A(-2, 1), B(a, 0), C(4, b), D(1, 2).
    a) Find the coordinates of the point P.
    b) Find the numbers a and b.



12. a) What is the slope of the line joining the points (2, 4), (5, 8)?
    b) Write the coordinates of other two points on this line.
13. A(1, 4), B(3, 7), C(9, 16) are three points.
    a) Find the slope of the line AB.
    b) Check whether A,B,C are points on a line.
14. a) Find the slope of the line joining (1, 5), (5, 8).
    b) Can you draw a triangle by joining the points (1, 5), (5, 8), (13, 14).
15. (5, 6) is a point on the line with slope 3/4.
    a) Find the coordinates other two points on this line.
    b) What is the slope a line parallel to this line?
16. a) What is the slope of the line joining the points (-1, 3) and (3, 6).
    b) Write the coordinates any other point on this line.
    c) If (x, y) is a point on this line then, prove that (x+4, y+3) also point on this line.
17. In the figure, O is the origin and ABCD is a square.
    a) Find the coordinates of the vertex C.
    b) Find the slope of the line AC.



18. In the figure, A(1, 0), B(7, y) .
    a) Find the length of BM.
    b) What is the slope of the line AB?
    c) What is the number 'y'?



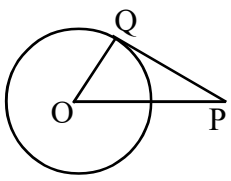
SOLIDS

1. A cone is made by bending a sector of radius 12cm and central angle 60^0.
   a) What is the sland height of the cone?
   b) What is the radius of the cone?
2. A sector of central angle 216^0 is cut out from a circle of radius 15cm and bend to form a cone.
   a) Find the slant height of the cone.
   b) What is the height of the cone?
3. What is the radius and central angle of a sector needed to make a cone of radius 18cm and height 24cm?
4. a) What is the relation between the radius and slant height of cone made by bending a semicircle?
   b) What is the radius and slant height of cone made by bending a semicircle of radius 10cm?
5. Base radius of a cone is 12cm and its height 16cm.
   a) What is the slant height?
   b) What is the curved surface area of the cone?
   c) What is the total surface area of the cone?
   d) Find the volume of the cone.
6. A cone of radius 3cm is made by bending a sector. Slant height of this cone is 15cm.
   a) What is the central angle of the sector?
   b) What is the area of sector?
   c) What is the area of the sector?
7. Two cones are made by bending sectors with central angles 60^0, 120^0. Radius of the small cone is 5cm.
   a) Find the slant height and curved surface area of the smaller cone?
   b) What is the base area of the larger cone?
8. Base area of a cone is $64\pi cm^2$ and slant height is 20cm.
   a) What is the height of the cone?
   b) What is the total surface area of the cone?
   c) What is the volume of the cone?
9. Base area of a cone is $576\pi cm^2$ and volume is $1920\pi cm^3$.
   a) What is the height of the cone?
   b) What is the curved surface area of the cone?
10. Volume of a solid cone is $360\pi cm^3$ and diameter 12cm. A cone of maximum size is carved out from this cylinder.
    a) What is the volume of the cone?
    b) What is the height of the cone?
11. Base diameter of a cone is $40\pi cm$ and slant height is 25cm.
    a) What is the curved surface area of this cone?
    b) What is the volume of the cone?
12. A cone is made by bending a semicircle of radius 10cm.
    a) Find the slant height and radius of this cone?
    b) What is the curved surface area?
    c) What is the total surface area of this cone?
13. Curved surface area of a cone made by bending a semi-circle is $26\pi cm^2$.
    a) What is the base area of this cone?
    b) What is the total surface area of this cone?
14. Ratio of radii of two cones is 2:3 and ratio of their heights is 5:4.
    a) What is the ratio of their perimeters?
    b) What is the ratio of their volumes?
    c) If the volume of the second cone is $500cm^3$ then, what is the volume of the second cone?
15. Ratio of volume of two cones is 3:2 and ratio of radii of two cones is 1:2
    a) If the volume of the second cone is $100cm^3$ then, what is the volume of the second cone?
    b) What is the ratio of their heights?

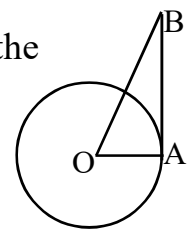
16. Radius of a metalic cylinder is 12cm and height is 18cm.
a) A cone is made by melting this cylinder with radius 9cm. What is the height of this cone?
b) How many cone is made by melting this cylinder with radius 4cm and 9cm.

TANGENTS

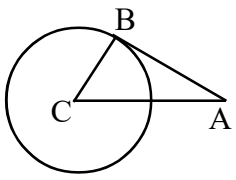
1. In the figure, O is the centre and PQ is a tangent. OP=13cm, OQ=5cm.
a) What is the measure of ∠PQO?



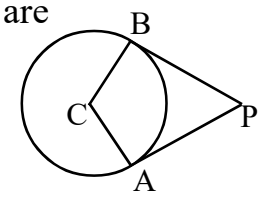
2. In the figure, O is the centre and AB is a tangent. ∠B=30⁰ and radius of the circle is 6cm.
a) What is ∠OAB?
b) Find the length of OB and AB.



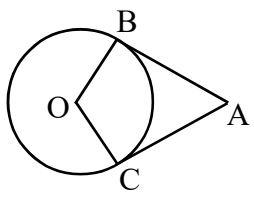
3. In the figure, C is the centre and length of the radius and tangent are equal.
a) What ∠A and ∠B?
b) If the radius of the circle is 5cm then, find the length of AB and AC?



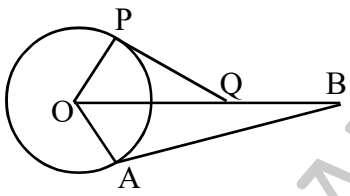
4. In the figure, C is the centre and PA , PB are tangents. Radius of the circle is 6cm.
a) What is the length of PB?
b) What is the length of PC?



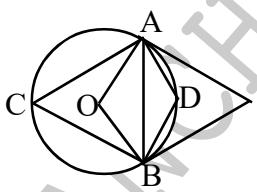
5. In the figure, O is the centre and AB, AC are tangents. ∠BOC=120⁰ and radius is 12cm.
a) What is ∠BAC?
b) What is ∠OAB?
c) Find the length of AB and AC.



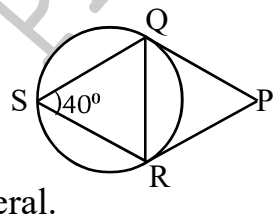
6. In the figure, O is the centre and PQ, PR are tangents.
PQ=5cm, OQ=13cm and OB=15cm.
a) What is the radius of the circle?
b) What is the length of AB?



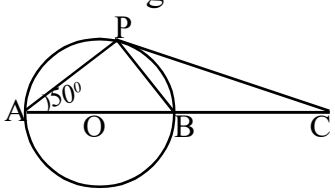
7. In the figure, O is the centre and PA, PB are tangents. ∠D=100⁰.
a) Find ∠AOB and ∠ACB.
b) Find ∠APB.



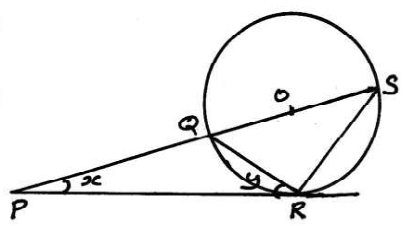
8. In the figure, PQ, PR are tangents and ∠QSR=40⁰.
a) Find all angles of ΔPQR.
b) If ΔQRS is equilateral then, prove that ΔPQR is also equilateral.



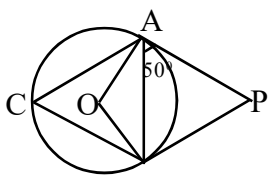
9. In the figure, O is the centre and PC is a tangent.
If ∠PAB=50⁰ then,
a) What is ∠BPC?
b) What is ∠APC?
c) What is ∠PCB?
c) If ∠A=x⁰ then, prove that ∠C=90-2x



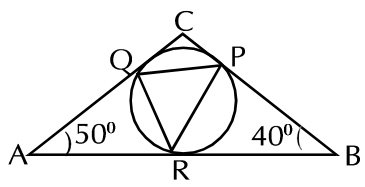
10. In the figure, O is the centre and PR is a tangent
a) If ∠PRQ=30⁰ then, find ∠QOR and∠QSR.
b) What is ∠PRS ?
c) What is ∠QPR?
d) ∠P=x⁰ and ∠PRQ=y⁰, then show that x+2y=90⁰



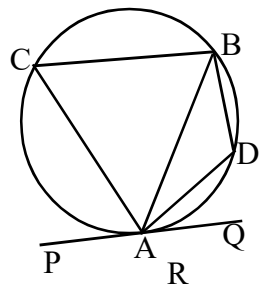
11. In the figure, O is the centre and PA, PB are tangents.
If ∠PAB=50⁰ then,
a)What is ∠C?
b) What is ∠PBA?
c) Find ∠P.



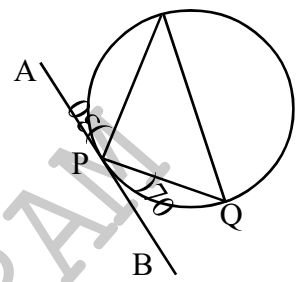
12. In the figure, sides of triangle ΔABC are touches the circle at the points P,Q and R. If ∠B=40⁰ and ∠A=50⁰ then,
a) Find ΔAQR.
b) Find all angles of ΔPQR.
c) Find all angles of ΔPQC.



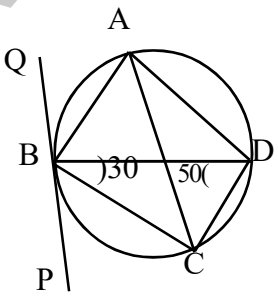
13. In the figure, PQ is a tangent and ΔABC is an equilateral.
a) What is ∠PAC?
b) What is ∠BDA?



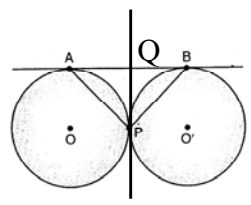
14. In the figure, PQ is a tangent ∠BPQ=70⁰ and ∠ARP=30⁰.
a) FInd the ∠R and ∠Q.
b) Find ∠RPQ.



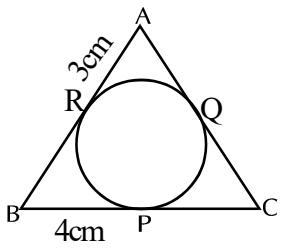
15. In the figure, PQ is a tangent, ∠BDC=50⁰ and ∠CBD=30⁰
a) What is ∠CAD?
b) What is ∠PBC?
c) What is ∠QBA?
d) What is ∠ADC?



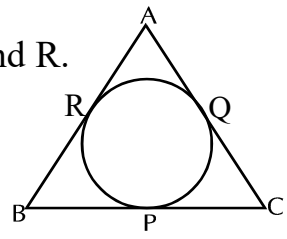
16. In the figure, AB and PQ are tangents.
a) What is the line of length equal to the line AQ?
b) Prove that ∠QBC=∠QPB.
c) Find ∠APC.



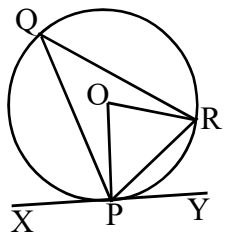
17. In the figure, sides of ABC touches the circle at the points P, Q and R.
BP=4cm, AR=3cm and BC=9cm.
a) What is the length of PC?
b) What is the length of AC?
c) What is the perimeter of ΔABC?



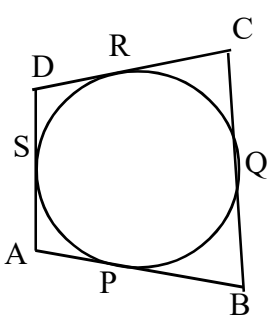
18. In the figure, sides of ΔABC touches the circle at the points P,Q and R.
AB=8cm, BC=7cm and BC=12cm. Find the lengths of BP, PC and AR.



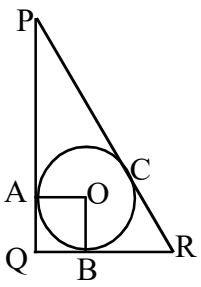
19. In the figure, O is the centre and XY is a tangent. ∠RPY=60⁰, PR=6cm
a) Find ∠POR
b) What is the radius of the circle?



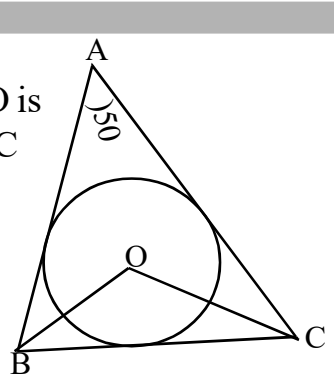
20. In the figure, sides of the quadrilateral ABCD touches the circles P,Q,R and S.
a) Prove that AB+CD=BC+AD.
b) If AP=2cm, BQ=5cm, CR=3cm and DS=4cm then, Find the perimeter of the quadrilateral ABCD.
c) If AB+CD=20cm then What is AD+BC? What is the perimeter ABCD?



21. In the figure, the circle with centre O toches the sides PQ, QR of the triangle PQR at A and B. ∠Q=90⁰, QB=3cm BR=5cm and PQ=6cm.
a) What is the length of QA?
b) Find ∠A and ∠B.
c) What is the length of the radius?
d) Find the length of PR.

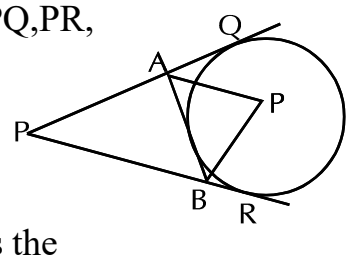


22. In the figure, the circle with centre O is touches the sides of the triangle ABC and $\angle A=50^0$



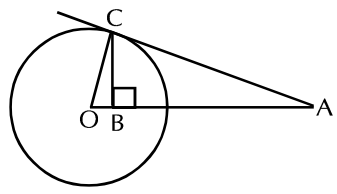
a) What is $\angle B+\angle C$
b) What is $\angle OBC+\angle OCB$?
c) What is $\angle BOC$?

23. In the figure, O is the centre and PQ,PR, AB are tangents. $\angle A=50^0$, $\angle P=30^0$



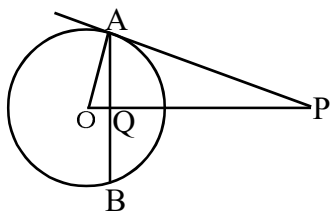
a) What is $\angle BAQ$?
b) What is $\angle PBA$?
c) What are the angles of ΔAOB?

24. In the figure, AC is a tangent , O is the centre of the circle and the line CB is perpendicular to AB.



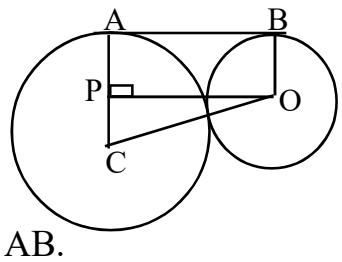
a) Find the $\angle ACO$ and $\angle CBO$.
b) Prove that OA x OB=r^2.
c) If AB=6cm and OB=2cm then find the radius. What is the length CB?

25. In the figure, O is the centre, PA is a tangent, Q is the mid-point of AB and r is the radius of the circle.



a) Find $\angle OAP$
b) Write one pair of equal angles.
c) Prove that OP x OQ=r^2.

26. In the figure, C, O are centres of circles, AB is a common tangent and radii of the circles are 8cm, 3cm.



a) Fid $\angle A$ and $\angle B$.
b) Find the length of PC.
c) Find the length of OC.
d) Find the length of the tangent AB.

CONSTRUCTION

1. Draw a circle of radius 3cm. Mark a point P on the circle. Draw a tangent through the point P.
2. Draw a circle of radius 3.5 cm. Mark a point A, 7cm apart from the centre. Draw tangents from A to the circle. Measure its length.
3. Draw a circle of radius 2.5cm. Draw a triangle with two angles 50^0, 60^0 and sides touches the circle.
4. In the figure, O is the centre, $\angle POQ=110^0$ and $\angle B=50^0$

a) Find $\angle A$
b) Find the measures of $\angle POR$ and $\angle QOR$
c) Draw a circle with the radius is 2cm

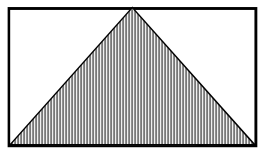
5. Draw a triangle with two angles 50^0, 70^0 and circum radius 3.5cm.
6. Draw a triangle with two angles 45^0, 60^0 and circum radius 3.5cm. Measure the sides.
7. AB is the diameter of the semicircle.

a) If AC=4cm and CB=2cm then, find the length of CD.
b) Draw a line of length of 12cm

8. Draw a rectangle of sides 5cm and 4cm then draw a square of equal area.
9. Draw a square of a rectangle with sides 5cm and 3cm. draw a square of equal area of the rectangle. What is the area of the square?

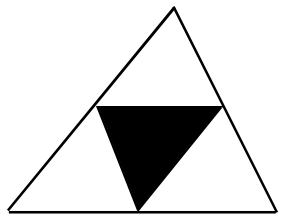
MATHEMATICS OF CHANCE

1. In the figure, area of the rectangle is 14 sq.centimeter



a) What is the area of the shaded triangle?
b) A point is marked without looking, What is the probability of that point is inside the triangle?

2. In the figure the shaded triangle is drawn by joining the mid point of the sides of large triangle calculate the probability of a dot put on larger triangle to be within the shaded traingle.



3. A box containing paper slips numbered the numbers less than 9,
a) Howmany paper slips are in the box?
b) A paper slip is drawn from this box, What is the probability of that number is a prime?
4. (a) How many two digit natural numbers are there in all?
b)What is the probability that the number is a prime number?
5. (a) How many two digit natural numbers are there in all?
(b) If we choose one number from the two digit numbers, what is the probability that the sum of digits of that number will be 10?
c) What is the probability that the number is a square number?
6. A box containing 18 pearls including red and green. Probability of a red pearl is selected from the box is 2/3.
a) A pearl is selected from the box,What is the probability of that is green?
b) How many red pearls are in this box?
c) What is number of green pearls in this box?
7. A box contain 9 blue balls and 11 red balls. Another box contains 6 blue and 7 red balls. One ball is drawn without looking .
a) If we want a blue ball,which box better to select?
b) What is the probability that to be a red ball from first box?
c) All balls are put together in to a box and take a ball from it.What is the probability that is a red ball?
8. What is the probabilty of 5 sundays in the month December?
9. 366 days in a leap year.
a) What is the probability of getting 5 sunday in February of a leap year?
b) What is the probability of getting 53 sundays in a leap year?
c) What is the probability of getting 53 sundays other than a leap year?