CIRCLES

Find the value of $\angle ACD + \angle BED$. (Fig 5)

Q9. In fig 6, RS is diameter of the circle, NM is parallel to RS and $\angle MRS = 29°$, find $\angle RNM$.

Q10. Two congruent circles intersect each other at point A and B. Through A any line segment PAQ is drawn so that P, Q lie on the two circles. Prove that $BP = BQ$.

Q11. A circle has radius $\sqrt{2}$ cm. It is divided into two segments by a chord of length 2 cm. Prove that the angle subtended by the chord at a point in major segment is $45°$.

Q12. Two chords AB and CD of lengths 5 cm and 11 cm resp. of a circle are parallel to each other and are on opposite sides of its centre. If the distance between AB and CD is 6 cm, find the radius of the circle.

Q13. The lengths of two parallel chords of a circle are 6 cm and 8 cm. If the smaller chord is at a distance of 4cm from the centre, what is the distance of other chord from the centre?

Q14. AC and BD are chords of a circle that bisect each other. Prove that AC and BD are diameters and ABCD is a rectangle.

Q15. Bisectors of angles A, B, C of a $\triangle ABC$ intersects its circumcircle at D, E and F resp. Prove that angles of $\triangle DEF$ are $90° - \frac{A}{2}$, $90° - \frac{B}{2}$ and $90° - \frac{C}{2}$. (Fig 7)

Q16. AB and AC are two chords of a circle of radius r such that $AB = 2AC$. If p and q are the distances of AB and AC from the centre. Prove that $4q^2 = p^2 + 3r^2$. (Fig 8)

WORKSHEET CLASS IX CHAPTER - 10
CIRCLES

Q1. What is the minimum number of points required to determine a unique circle?

Q2. If a circle is divided into eight equal parts, find the angle subtended by each arc at the centre.

Q3. If AOB is a diameter of a circle and C is a point on the circle, then prove that $AC^2 + BC^2 = AB^2$.

Q4. In fig 1, if O is the centre of the circle, then find $\angle AOB$.

Q5. In fig 2, $\triangle ABC$ is equilateral. Find (i) $\angle ADC$ (ii) $\angle AEC$.

Q6. In fig 3, $\angle ABC = 45°$, prove that $OA \perp OC$.

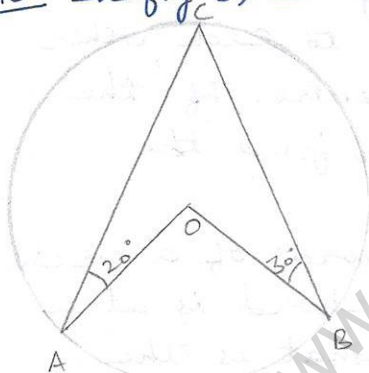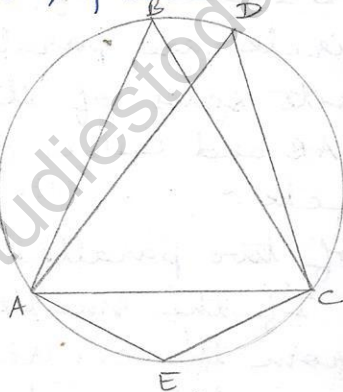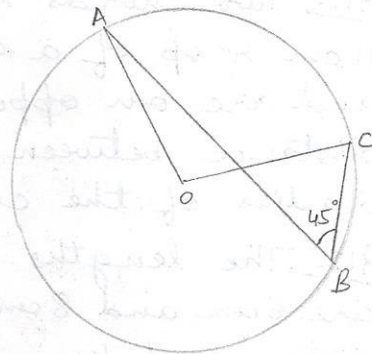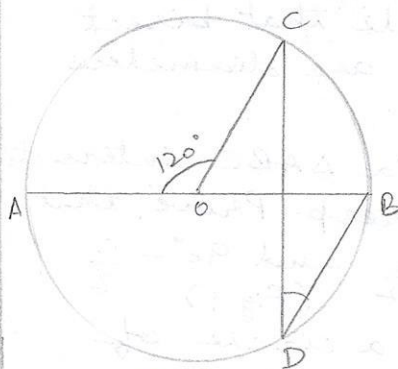Fig 1   Fig 2   Fig 3

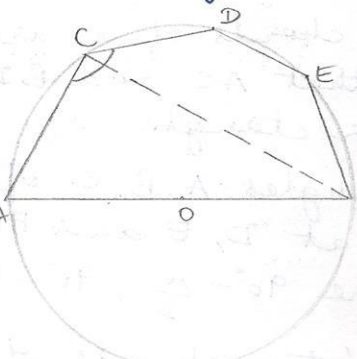Fig 4   Fig 5   Fig 6
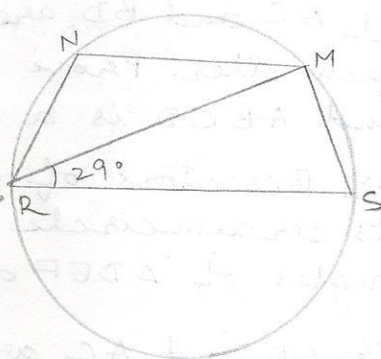
Q7. In fig 4, $\angle AOC = 120°$. Find $\angle BDC$.

Q8. AOB is the diameter of the circle and C, D, E are any three points on the semi-circle. (Fig 5)

WORKSHEET CLASS - IX CHAPTER - 10
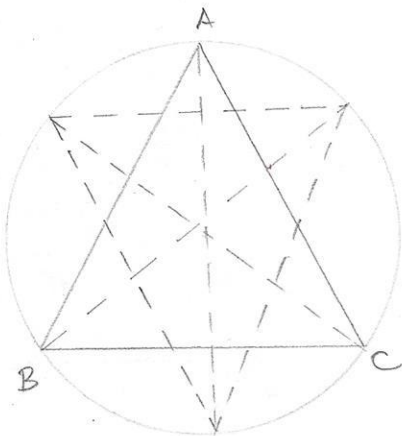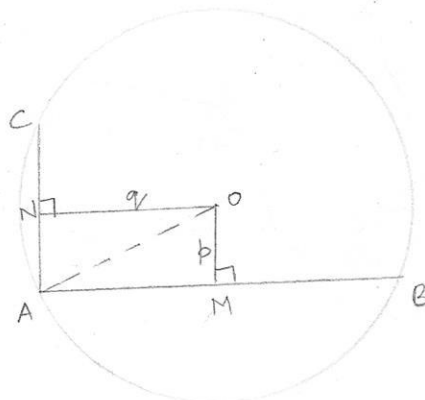
CIRCLES

Fig 7

Fig 8

Q17. Write True or False and justify your answer:

1. Two chords AB and CD of a circle are each at distances 4cm from the centre. Then AB = CD.

2. Two chords AB and AC of a circle with centre O are on the opposite sides of OA. Then $\angle OAB = \angle OAC$.

3. Two congruent circles with centres O and O' intersect at two points A and B. Then $\angle AOB = \angle AO'B$.

4. Through three collinear points a circle can be drawn.

5. A circle of radius 3cm can be drawn through two points A, B such that AB = 6 cm.

Q18. AOC is a diameter of the circle and arc AXB = $\frac{1}{2}$ arc BYC. Find $\angle BOC$. (Fig 9)

Q19. ABCD is a quadrilateral such that A is the centre of the circle passing through B, C and D. Prove that $\angle CBD + \angle CDB = \frac{1}{2} \angle BAD$.

Q20. $\angle ADC = 130°$ and chord BC = chord BE. Find $\angle CBE$. (Fig 10)

Q21. O is the centre of the circle, $\angle BCO = 30°$. Find x and y. (Fig 11)

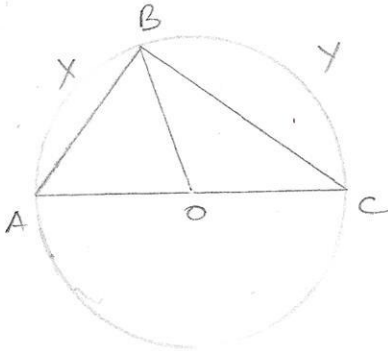WORKSHEET   CLASS - IX   CHAPTER - 10

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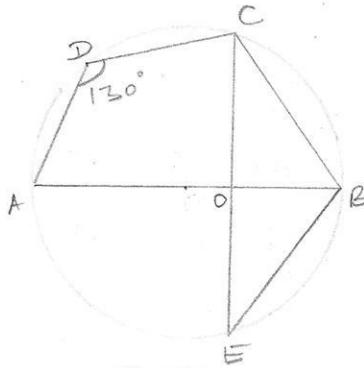

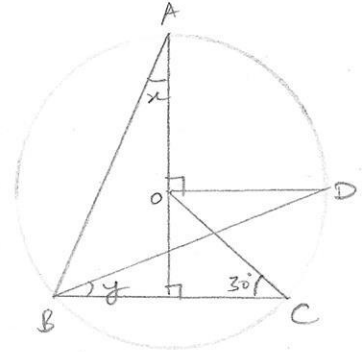Fig 9

Fig 10

Fig 11.

WORKSHEET CLASS-IX CHAPTER-11
CONSTRUCTIONS

Q1. Construct an equilateral triangle if its altitude is 6cm.

Q2. Answer the following questions:
(a) Can we construct an angle of 37.5°? Justify.
(b) An angle of 62.5° can be constructed? Justify.
(c) An angle of 22.5° can be constructed. Justify.
(d) The construction of a $\triangle ABC$ in which $AB = 5cm$, $\angle A = 60°$ is possible when difference of BC and AC is given. Why?

Q3. State True or False and justify:
(a) a $\triangle ABC$ canbe constructed in which $AB = 6.5cm$, $\angle A = 75°$ and $BC - AC = 6cm$.
(b) a $\triangle PQR$ cannot be constructed in which $PQ = 3cm$, $\angle Q = 90°$ and $QR - RP = 2.8cm$.
(c) a triangle canbe constructed in which $\angle B = 75°$, $\angle C = 60°$ and $AB + BC + CA = 15cm$.
(d) a triangle canbe constructed in which $\angle A = 60°$, $\angle B = 35°$ and $AB + BC + CA = 9cm$.

Q4. Draw an angle of 80° with the help of a protractor. Then construct angles of (i) 40°
(ii) 160° (iii) 120°.

Q5. Draw a line AB of 5cm in length. Draw a line perpendicular to AB through A and B resp. Are these lines parallel?

Q6. Construct each of the following and give justification:
(a) A triangle ABC given that $AC = 8cm$, $\angle A = 60°$ and $AB + BC = 15cm$.
(b) A triangle PQR in which $PQ = 6.2cm$, $\angle Q = 60°$ and $RQ - $

WORKSHEET CLASS IX CHAPTER-11
CONSTRUCTIONS

(c) A triangle XYZ in which YZ = 5cm, $\angle Y = 75°$ and XZ - XY = 2.5 cm.

(d) A triangle PQR given that $\angle Q = 60°$, $\angle R = 30°$ and PQ + QR + RP = 12.5 cm.

(e) A triangle ABC in which $\angle A = 45°$, $\angle B = 90°$ and AB + BC + CA = 14 cm.

(f) an equilateral triangle if its altitude is 4.3cm.

(g) a triangle in which $\angle B = 45°$ and $\angle C = 120°$ and AB + BC + CA = 10.5 cm.

WORKSHEET CLASS-IX MATHS-14

STATISTICS

Q1. Find the class mark of the class $100 - 120$.

Q2. A child says that the median of $3, 14, 18, 20, 5$ is 18. What doesn't the child understand about finding the median?

Q3. The class marks of a continuous distribution are: $1.04, 1.14, 1.24, 1.34, 1.44, 1.54$ and 1.64. Is it correct to say that the last interval will be $1.55 - 1.73$? Justify your answer.

Q4. The mean of the data : $2, 8, 6, 5, 4, 5, 6, 3, 6, 4, 9, 15, 6, 5$ is given to be 5. Based on this information, is it correct to say that the mean of the data : $10, 12, 30, 18, 8, 12, 6, 12, 10, 8, 10, 12, 16, 4$ is 10? Give reason.

Q5. 30 children were asked about the number of hours they watched TV programmes. The result

Number of hours	0 – 5	5 – 10	10 – 15	15 – 20
Frequency	8	16	4	2

Can we say that the number of children who watched TV for 10 or more hours a week is 22? Justify your answer.

Q6. In a histogram, the areas of the rectangles are proportional to the frequencies. Can we say that the lengths of the rectangles are also proportional to the frequencies?

Q7. If the mode of the data $5, 8, 4, 5, 5, 8, 4, 7, 8, x$ is 5, then find the value of x.

Q8. Ten observations $6, 14, 15, 17, x+1, 2x-13, 30, 32, 34, 43$ are written in an ascending order. The median of the data is 24. Find the value of x. Ans: 20.

WORKSHEET CLASS-IX CHAPTER - 14

STATISTICS

Q9. The points scored by a basketball team in a series of matches are as follows:

17, 2, 7, 27, 25, 5, 14, 18, 10, 24, 48, 10, 8, 7, 10, 28.

Find the median and mode. Ans: 12, 10

Q10. A study was conducted to find out the concentration of sulphur dioxide in the air in parts per million (ppm) of a certain city. The data obtained for 30 days is as follows:

0.03	0.08	0.16	0.11	0.11	0.08	0.15	0.08	0.01	0.07	0.08	0.02	0.12	0.10	0.05
0.09	0.06	0.13	0.06	0.07	0.04	0.18	0.22	0.09	0.01	0.17	0.20	0.07	0.18	0.04

(i) Make a grouped frequency distribution table with class interval 0.00 – 0.04.

(ii) For how many days, was the concentration of sulphur dioxide more than 0.11 ppm?

Q11. Convert the given frequency distribution into a continuous grouped frequency distribution:

Class interval	Frequency
150 – 153	7
154 – 157	7
158 – 161	15
162 – 165	10
166 – 169	5
170 – 173	6

In which intervals would 153.5 and 157.5 be included?

Q12. If the mean of the following data is 20.2, find the value of p:

x	10	15	20	25	30
y	6	8	p	10	6

WORKSHEET CLASS _____ CHAPTER-14

STATISTICS

Q13. The marks obtained (out of 100) by a class of 80 students are given below:

Marks	10-20	20-30	30-50	50-70	70-100
Number of students	6	17	15	16	26

Construct a histogram to represent the data.

Q14. Draw a frequency polygon for :

Marks obtained	0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80
No. of students	7	10	6	8	12	3	2	2

Q15. What are the measures of central tendency?

Q16. Find the range of the data: 22, 25, 20, 32, 36, 28, 40, 45, 35, 38.

Q17. If the mean of the observation x, $2x+1$, $2x+5$, $2x+9$ is 30, what is the mean of last two observations?

Q18. In a frequency distribution, the mid value of a class is 10 and width of the class is 6. Then what will be the lower limit of the class?

Q19. Let m be the mid point and l be the upper limit of a class in a continuous frequency distribution. What will be the lower class limit?

Q20. Expenditure on Education of a country during a five year period, in crores of rupees, is given:

Elementary Education	240
Secondary Education	120
University Education	190
Teacher's Training	20
Social Education	10
Other Educational Prog.	115
Cultural Programmes	25
Technical Education	125

Represent the information by a bar graph.

WORKSHEET CLASS IX CHAPTER-14
STATISTICS

Q.21. Following table shows a frequency distribution for the speed of cars passing through at a particular spot on a highway:

Class interval	Frequency
30-40	3
40-50	6
50-60	25
60-70	65
70-80	50
80-90	28
90-100	14

Draw a histogram and frequency polygon representing the data above.

Q.22. Following table gives the distribution of students of sections A and B of a class according to the marks obtained by them.

Section A		Section B	
Marks	Frequency	Marks	Frequency
0-15	5	0-15	3
15-30	12	15-30	16
30-45	28	30-45	25
45-60	30	45-60	27
60-75	35	60-75	40
75-90	13	75-90	10

Represent the marks of the students of both the sections on the same graph by two frequency polygons. What do you observe?