

O. P. JINDAL SCHOOL, SAVITRI NAGAR
Half Yearly Examination (2019 – 2020)

Class: IX

MM: 80

Subject: Mathematics

Time: 3 Hrs.

Name: _____

Class / Section: _____

Roll No.: _____

(Fifteen Minutes Extra will be given for reading the Question Paper.)

General Instructions:

- (i) All questions are compulsory.
- (ii) The question paper consists of 40 questions divided into four sections A, B, C and D.
- (iii) Section A contains 20 questions of 1 mark each. Section B contains 6 questions of 2 marks each. Section C contains 8 questions of 3 marks each. Section D contains 6 questions of 4 marks each.
- (iv) There is no overall choice. However an internal choice has been provided. You have to attempt only one of the alternatives in all such questions.
- (v) Use of calculators is not permitted.

Section A

Question numbers 1 to 20 carries 1 mark each.

Choose the correct option:

- Q1. $\sqrt{7}$ is a polynomial of degree
 a) $\frac{1}{2}$ b) 0 c) 2 d) 1
- Q2. An angle is one fourth of its complement. The measure of the angle is
 a) 78° b) 75° c) 18° d) 72°
- Q3. Longest side in ΔABC , if $\angle A=40^\circ, \angle B=60^\circ$
 a) AC b) AB c) BC d) cannot be determined

OR

It is given that $\Delta ABC \cong \Delta FDE$ in which $AB = 5\text{cm}$, $\angle B = 40^\circ$, $\angle A=80^\circ$ and $FD = 5\text{cm}$. Then which of the following is true?

- a) $\angle D=60^\circ$ b) $\angle E=60^\circ$ c) $\angle F=60^\circ$ d) $\angle D=80^\circ$
- Q4. The perpendicular distance of the point $(-6,5)$ from the x-axis is
 a) 6 units b) 5 units c) 11 units d) 1 units
- Q5. If diagonals of a quadrilateral bisect each other at right angles, then the quadrilateral is
 a) trapezium b) parallelogram c) rhombus d) rectangle

OR

If ABCD is a parallelogram with two adjacent angles $\angle A=\angle B$, then the parallelogram is a

- a) rhombus b) trapezium c) rectangle d) none of these

- Q6. The linear equation $3x-2y=10$ has
 a) a unique solution b) two solutions c) no solution d) infinitely many solutions
- Q7. Coefficient of 'x' in: $4x^2-\sqrt{3}x-5=0$
 a) 0 b) $-3\sqrt{3}$ c) $-\sqrt{3}$ d) $3\sqrt{3}$
- Q8. The value of: $\frac{1}{\sqrt{2}}$ if $\sqrt{2}=1.414$
 a) 0.077 b) 0.77 c) 0.707 d) 7.07

Answer the following questions

- Q9. Find the value of: $(1296)^{\frac{1}{4}}$

OR

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

- Q10. Write two rational numbers between $\frac{3}{5}$ & $\frac{4}{5}$.
- Q11. Find zero of the polynomial: $p(x) = -8x+128$

OR

Write coefficient of x^2 in the polynomial $2 - x^2 + x^3$, also find its degree.

- Q12. Write the name of each part of the plane formed by horizontal & vertical lines.
- Q13. Find the value of k, if $x = -1, y = -3$ is a solution of the equation: $-3x+2y+k=0$

OR

Write the expression $x = -2$, in the form of $ax + by + c = 0$

- Q14. If $(2x)^\circ$ & $(3x+5)^\circ$ are supplementary angles, find x.

OR

Two complementary angles are in the ratio 11 : 7, find the angles.

- Q15. If angles of a right angle triangle are in ratio 2:3, find all angles of triangle.
- Q16. Write two differences between parallelogram and rectangle.
- Q17. What is the difference between axioms and postulates?
- Q19. Write one axiom of Euclid.
- Q20. If $AB=PQ$ and $PQ=XY$, then prove that $AB=XY$



Q25. Factorise: $4y^2-4y+1$

Q26. Rationalise the denominator: $\frac{2}{\sqrt{7}-\sqrt{5}}$

Section C

Question numbers 27 to 34 carries 3 marks each.

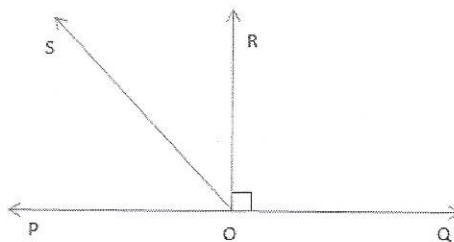
Q27. Express $0.2\overline{35}$ in the form of $\frac{p}{q}$.

Q28. Evaluate by using identity : 95×96

OR

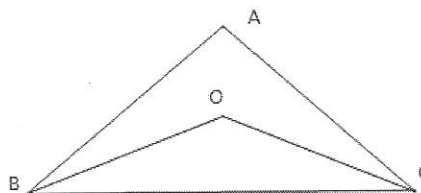
Factorise: $27p^3 - \frac{1}{216} - \frac{9}{2}p^2 + \frac{1}{4}p$

Q29. In the given figure POQ is a line. Ray OR is perpendicular to line PQ. OS is another ray lying between rays OP and OR. Prove that: $\angle ROS = \frac{1}{2}(\angle QOS - \angle POS)$



OR

In the given figure, prove that : $90^\circ + \frac{1}{2} \angle BAC$

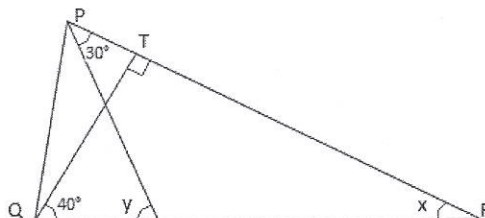


Q30. Show that if the diagonals of a quadrilateral bisect each other at right angles, then it is a rhombus.

OR

Show that the bisectors of the angles of a parallelogram form a rectangle.

Q31. Find x and y , if $\angle TQR=45^\circ$, $\angle SPR=30^\circ$ and $QT \perp PR$



OR

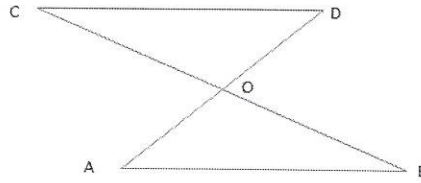
Section B

Question numbers 21 to 26 carries 2 marks each.

Q21. Line segment AB is parallel to another line segment CD. O is the mid-point of AD. Show that

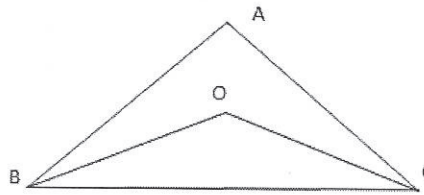
(i) $\triangle AOB \cong \triangle DOC$

(ii) O is midpoint of BC.

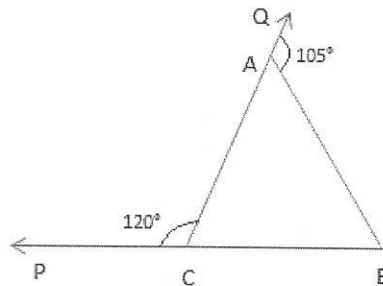


OR

In the given figure, $AB=AC$ and $OB=OC$, Prove that $\angle ABO = \angle ACO$

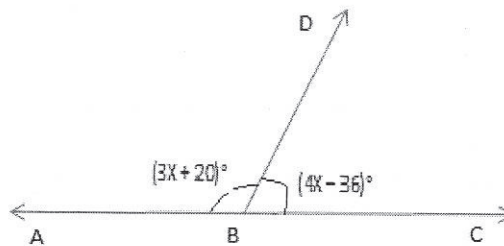


Q22. Find $\angle ABC$ in given figure



OR

Find the value of $\angle AOC$ & $\angle BOC$

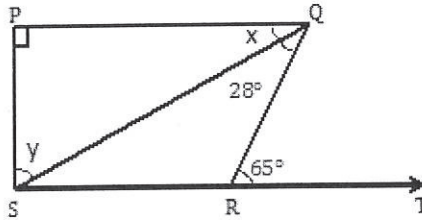


Q23. If the point (3,4) lies on the graph of the equation $3y = ax + 7$, find the value of a.

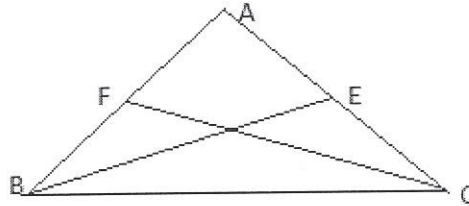
Q24. If $AC=BD$, then prove that $AB=CD$



In figure $PQ \perp PS$, $PQ \parallel SR$, $\angle SQR = 28^\circ$ and $\angle QRT = 65^\circ$, then find the values of x and y ?



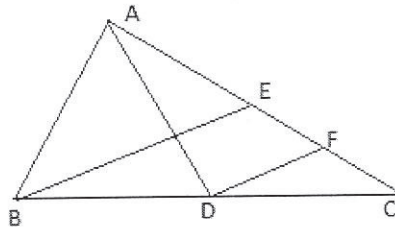
- Q32. In isosceles triangle ABC , if E & F are mid points of equal sides AB & AC , then show that $BE = CF$



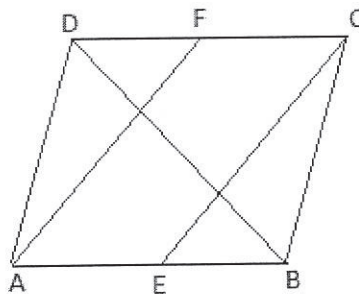
- Q33. Show that sum of three altitudes of a triangle is less than the sum of three sides of triangle.

OR

In the given fig. AD & BE are the medians of $\triangle ABC$ and $DF \parallel BE$, show that $CF = \frac{1}{4} AC$.



- Q34. In a parallelogram $ABCD$, E and F are the mid points of sides AB and CD respectively. Show that the line segments AF and EC trisect the diagonal BD .



Section D

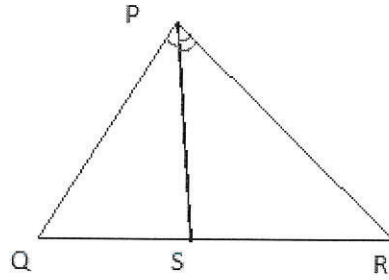
Question numbers 35 to 40 carries 4 marks each.

- Q35. Find the values of a & b so that the polynomial $x^4 + ax^3 - 7x^2 - 8x + b$ is exactly divisible by $(x+2)$ as well as $(x+3)$.
- Q36. The taxi fare in a city is as follows, for the first kilometer, the fare is ₹8 and for the subsequent distance it is ₹5 per kilometer. Taking the distance covered as x km and total fare is ₹ y . Write a linear equation and draw the graph.

OR

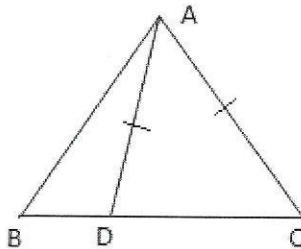
Draw the graph of the linear equation $3x + 2y = 12$. At what point does the graph cut the x-axis and y-axis.

Q37. In figure $PR > PQ$, and PS bisects $\angle QPR$. Prove that $\angle PSR > \angle PSQ$.

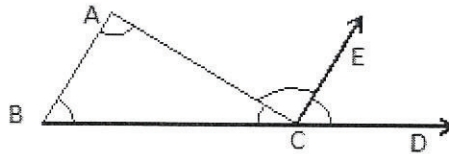


OR

D is a point on side BC of ΔABC such that $AD = AC$. Show that $AB > AD$

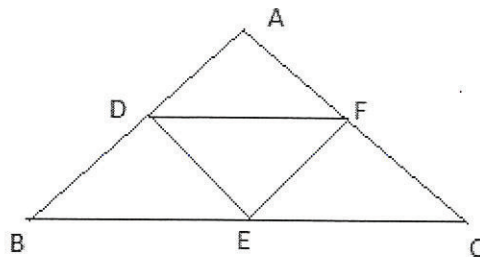


Q38. In the given figure ABC is a triangle in which $\angle A : \angle B : \angle C = 3 : 2 : 1$ and $AC \perp CD$, find $\angle ECD$



Q39. State and prove Mid-point theorem.

Q40. In ΔABC , D, E and F are respectively the mid points of sides AB, BC and CA. Show that ΔABC is divided into four congruent triangles by joining D, E and F.



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