First Term Exam – 2017-2018

Class – IX

Subject – MATHEMATICS

Time : 3 Hours Mehul Malhotra IX - E **Max. Marks : 80**

General Instructions:

(i) All questions are compulsory.

(ii) This question paper consists of 4 Sections and 30 questions.

Section A consists of 6 questions of 1 mark each

Section B consists of 6 questions of 2 marks each

Section C consists of 10 questions of 3 marks each

Section D consists of 8 questions of 4 marks each

SECTION-A (1x6=6)

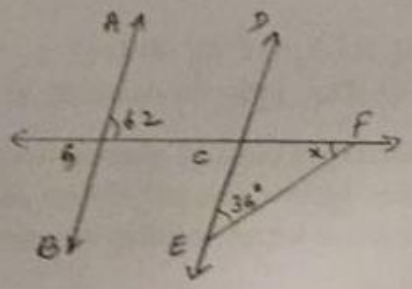
Q.1 Simplify $12\sqrt{18} - 6\sqrt{20} - 3\sqrt{50} + 8\sqrt{45}$

Q.2 Find the value of k if x^3+6x^2-4x-k is exactly divisible by $x-2$

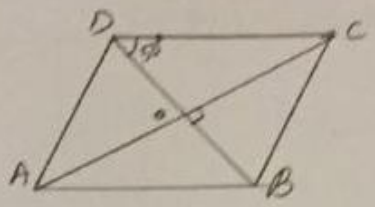
Q.3 If the coordinates of two points are P (-2, 3) and Q (-3, 5) then find (abscissa of P) – (abscissa of Q)

Q.4 A rabbit covers y metres distance by walking 10 m in slow motion and the remaining by x jumps, each jump contains 2 metres. Express this information in linear equation.

Q.5 In the figure AB || ED, find x.



Q.6 Diagonals AC and BD of a Parallelogram ABCD intersect at O. If $\angle BOC = 90°$, $\angle BDC = 50°$ find $\angle OAB$.



SECTION-B **(6x2=12)**

Q.7 Express $1.4\overline{19}$ in the form of $\frac{p}{q}$.

Q.8 Without actually calculating the cubes, find the value of $27^3+(-14)^3+(-13)^3$

Q.9 State and prove angle sum property of a triangle.

Q.10 ABC is an isosceles triangle in which altitudes BE and CF are drawn to equal sides AC and AB respectively. Show that these altitudes are equal.

Q.11 State the fifth postulate of Euclid.

Q.12 ABCD is a parallelogram in which P and Q are mid points of opposite sides AB and CD. Show that APCQ is a parallelogram.

SECTION-C **(3x10=30)**

Q.13 Represent $\sqrt{8.1}$ on a number line

Q.14 The polynomials ax^3+3x^2-13 and $2x^3-5x+a$ are divided by $x+2$. If the remainder in each case is the same, find the value of a.

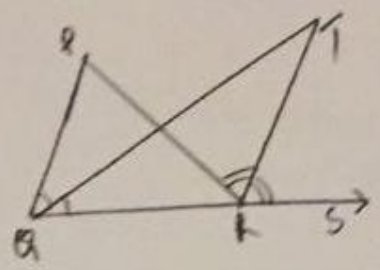
Q.15 Factorise : $2x^3-5x^2+x+2$

Q.16 Plot the points A (0, 4), B (-3, 0) C (0, -4) D (3, 0). Name the figure obtained by joining the points ABCD. Also, name the quadrants in which sides AB and AD lie.

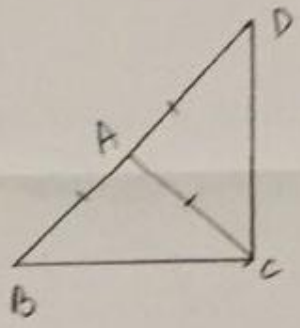
Q.17 Ravi and Ajay, two students of class IX planted trees in and around their school. What value are they showing by doing so? If Ravi planted twice as many trees as Ajay. Write a linear equation which satisfies this data and draw the graph of the same.

Q18. D is a point on side BC of ΔABC such that AD = AC. Show that AB>AD.

Q.19 In figure, the side QR of ΔPQR is produced to a point S. If the bisectors of $\angle PQR$ and $\angle PRS$ meet at point T, then prove that $\angle QTR = \frac{1}{2} \angle QPR$.

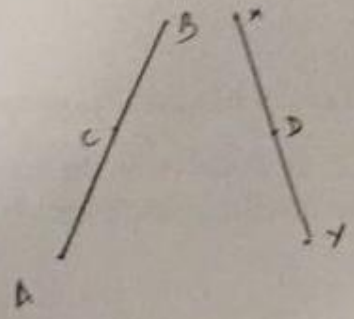


Q.20 Δ ABC is an isosceles triangle in which AB=AC, side BA is produced to D such that AD = AB. Show that $\angle BCD$ is a right angle.



Q.21 Two parallel lines *l* and *m* are intersected by a transversal *p*. Show that the quadrilateral formed by the bisectors of interior angles is a rectangle.

Q.22 In the given figure, AC = XD, C is a mid point of AB and D is a mid point of XY. Using Euclid's axiom, show that AB = XY



SECTION-D (4x8=32)

Q.23 If both a and b are rational numbers, find the value of 'a' and 'b'

$$\frac{7+\sqrt{5}}{7-\sqrt{5}} - \frac{7-\sqrt{5}}{7+\sqrt{5}} = a + \frac{7}{11}\sqrt{5}\,b$$

Q.24 (i) Simplify $\left\{5\left(16^{1/4} + 27^{1/3}\right)\right\}^{1/4}$

(ii) Represent $\sqrt{3}$ on a number line

Q.25 (i) Simplify $(5a + 3b)^3 - (5a-3b)^3$

(ii) Factorise $2x^2 + 7x - 15$

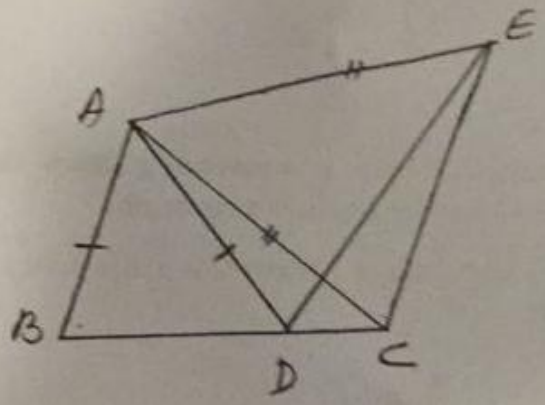
Q.26 Solve the equation $2x+1 = 2\left(\frac{1}{2}x + 3\right)$ and represent the solutions(s) on

(i) a number line

(ii) Cartesian plane.

Q.27 In ΔABC, the bisectors of $\angle B$ and $\angle C$ meet at O. Prove that $\angle BOC = 90 + \frac{\angle A}{2}$

Q.28 In figure AC = AE, AB = AD and $\angle BAD = \angle EAC$ show that BC = DE



Q.29 Show that the bisectors of angles of a parallelogram form a rectangle.

Q.30 ABCD is a rectangle and P, Q, R and S are the midpoints of the sides AB, BC, CD and DA respectively. Show that the quadrilateral PQRS is a rhombus.