OSDAV Public School, Kaithal
Half yearly Exams (2024-25)
Class : IX
Subject : MATHEMATICS

SET-A

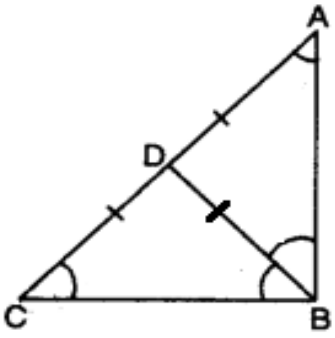
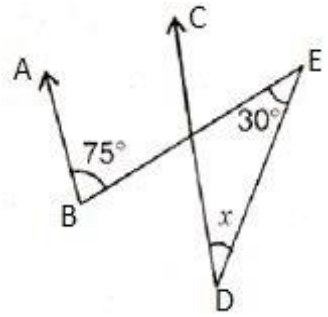
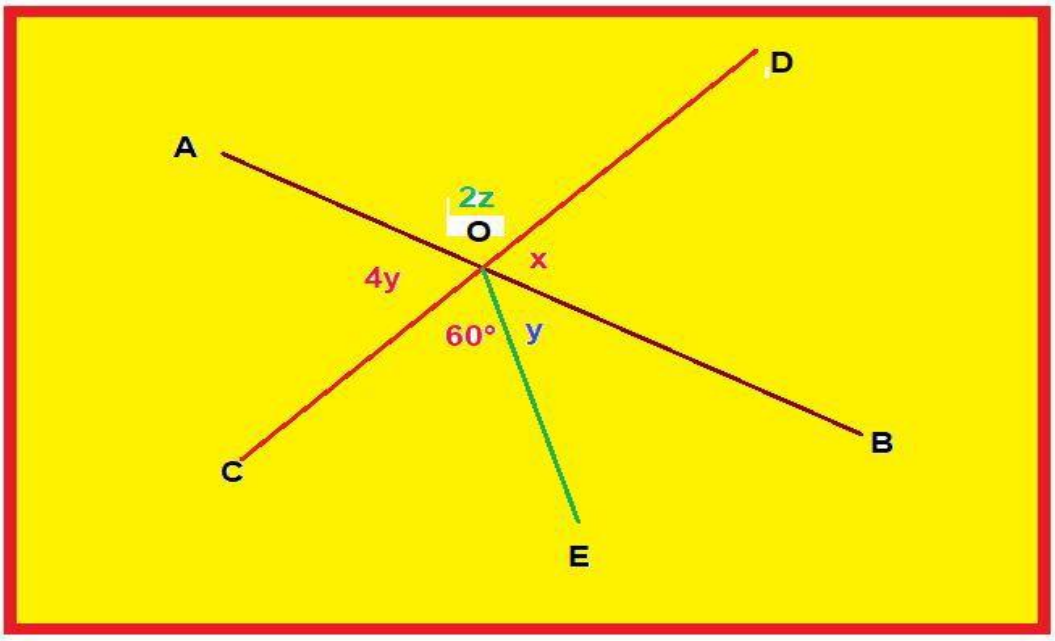
Time: 3 Hrs . **M.M. : 80**

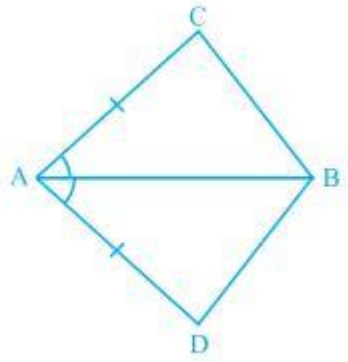
General Instructions:-

I. **All questions are compulsory.**
II. This Question Paper has 5 Sections A-E.
III. Section **A** has 20 MCQs carrying 1 mark each
IV. Section **B** has 5 questions carrying 02 marks each.
V. Section **C** has 6 questions carrying 03 marks each.
VI. Section **D** has 4 questions carrying 05 marks each.
Section **E** has 3 case based integrated units of assessment (04 marks each) with sub-parts of the values of 1, 1 and 2 marks each respectively

Q.N.	Questions	Marks
	SECTION A	
1	The rational number between 7 and 8 is (a) 1/2 (b) 11/2 (c) 15/2 (d) None of these	**1**
2	The perimeter of an equilateral triangle is 90m. The area of triangle is (a) $10\sqrt{3}$ m² (b) $15\sqrt{3}$ m² (c) $225\sqrt{3}$ m² (d) $100\sqrt{3}$ m²	**1**
3	x = 5, y = 2 is a solution of the linear equation: (a) 2x + y = 14 (b) 3x – 2y = 25 (c) x + 2y = 9 (d) x + y = 14	**1**
4	Are -3 and 3 are zeroes of the polynomial x+3 ? (a) Only -3 is zero (b) Only 3 is zero (c) no, none is zero (d) Yes both are zeroes	**1**
5	A point both of whose co-ordinates are negative lies in (a) quadrant II and IV (b) quadrant I and III (c) quadrant III only (d) quadrant I only	**1**
6	If the *x* - coordinate of a point is zero, then this point lies: (a) In II quadrant (b) In I quadrant (c) On x-axis (d) On y-axis	**1**
7	The number 8.23232323……..... is (a) a natural number (b) a whole number (c) a rational number (d) an irrational number	**1**
8	In two triangles ABC and DEF, AC = DF , ∠C = ∠F and BC = EF so Δ ABC ≅ ΔDEF by which congruence rule. (a) SSS Congruence rule (b) SAS Congruence rule (c) RHS Congruence rule (d) None of these	**1**
9	Which of the following is a criterion for congruence of triangles? (a) SSA (b) ASA (c) ASS (d) AAA	**1**
10	In ΔPQR if ∠QPR =80 and PQ = PR, then ∠Q and ∠R are (a) 80 , 70 (b) 80, 80 (c) 70, 80 (d) 50,50	**1**
11	To solve the equation a -20 = 15 which Axiom is used. (a) first (b) second (c) third (d) fourth	**1**
12	Write the complement of 70° (a) 30° (b) 20° (c) 110° (d) None of these	**1**
13	The number of Euclid Axioms is (a) 5 (b) 7 (c) 6 (d) 4	**1**

14	In triangle ABC, ∠A = 100° and AB =AC Which type of triangle is this (a) Acute Angle Triangle (b) Obtuse Angle Triangle (c) Right Angle Triangle (d) None of these	**1**
15	Write the Coefficient of x^2 in the given polynomial $x^3 - 3x^2 - 5x + 8$ (a) 5 (b) 3 (c) - 3 (d)**1**	**1**
16	Find b, if x = 5, y = 0 is a solution of the equation 2x + 7y = b (a)8 (b) 10 (c)15 (d) none of these	**1**
17	The polynomial $2x^3 - x^2 + 5x + 8$ is (a) an equation (b) a quadrinomial (c) biquadratic (d) a monomial	**1**
18	Let x and y be rational and irrational number respectively. Then x y is necessarily (a) whole number (b) a rational number (c) an irrational number (d) a natural number	**1**
19	**Assertion:** The value of 95 x 105 = 9975 **Reason:** $(a+b)(a-b) = a^2 - b^2$ (a.) Both Assertion and Reason are correct and Reason is the correct explanation for Assertion (b.) Both Assertion and Reason are correct and Reason is not the correct explanation for Assertion. (c.) Assertion is true but the Reason is false. (d.) Assertion is false but the Reason is true.	**1**
20	**Assertion**: 15 is a composite number. **Reason** : 15 is an odd number. (a.) Both Assertion and Reason are correct and Reason is the correct explanation for Assertion (b.) Both Assertion and Reason are correct and Reason is not the correct explanation for Assertion. (c.) Assertion is true but the Reason is false. (d.) Assertion is false but the Reason is true.	**1**
	SECTION B	
21	Write 4x = - 8y + 4 in the form of ax + by + c = 0. Also write value of a, b and c.	**2**
22	Express 2.235235235…… in form p/q where p and q are integers and $q \neq 0$	**2**
23	Expand $(995)^3$ by suitable identity.	**2**
24	If Q is midpoint of line segment AB and P is midpoint of AQ then , show that PQ = 1/4AB	**2**
25	The sum of two angles of a triangle is 80° and their difference is 20°. Find all the angles of a triangle	**2**
	SECTION C	
26	Find three solutions of equation 3x - 2y = 24	**3**
27	The perimeter of triangular field is 540 m and its sides are in the ratio 12 : 17: 25. Find the area of the triangle.	**3**
28	Factorise $x^3 - 6x^2 + 3x + 10$	**3**
29	If $\frac{4+\sqrt{5}}{4-\sqrt{5}} = a + b\sqrt{5}$. Find value of **a** and **b** .	**3**
30	Plots the points A(6,2) ,B(3,-5), C(0,-4), D(-2,2), E(-3,-2) and F(5,0) on the graph paper.	**3**
31	In a triangle ABC, D is midpoint of side AC such that BD = ½AC then show that ∠ ABC is a right angle.	**3**

		
	SECTION D	
32	(i) Prove that if two lines intersect at a point then the vertically opposite angles are equal. (ii) In the given figure AB || CD, find value of x. 	**5**
33	(i) √Represent √3 on the number line. (ii) Simplify : $8\sqrt{242} - 5\sqrt{50} + 3\sqrt{98}$	**5**
34	Find the value of a and b so that polynomial $f(x) = x^3 + 10x^2 + ax + b$ is exactly divisible by (x -1) and (x -2) .	**5**
35	Find the area of a triangle whose perimeter is 360cm and its two sides are 160cm and 36cm. Calculate the altitude of triangle corresponding to its shortest side.	**5**
	SECTION E	
36	Maths teacher draws a straight line AB shown on the blackboard as per the following figure. 	**4**

	Now he told Raju to draw another line CD as in the figure The teacher told Ajay to mark ∠AOD as 2z Suraj was told to mark ∠AOC as 4y Clive Made an angle ∠COE = 60° Peter marked ∠BOE and ∠BOD as y and x respectively. Now answer the following questions on the basis of above information (i) What is the value of ∠BOE ? (ii) What is the value of ∠AOD ? (iii) What is the measure of x + y ?	
37	Mrs Sukanya, a Maths teacher was explaining the topic of congruency of triangle by paper folding method. she took a quadrilateral shaped original sheet ACBD and folded it in a such a way from point A and B that AB bisects ∠A and AC = AD  Now answer the following questions on the basis of above information (i) why is ∠CAB= ∠DAB ? (ii) ΔABC and ΔABD are congruent by which congruence criteria. (iii) Show that $\Delta \boldsymbol{ABC} \cong \Delta$ ABD	**4**
38	On 15th birthday Aryan gave party to his friends. He purchased 4 pizzas and 2 burgers from school canteen and paid Rs 800 Based on above information answer the following questions (i) Form the linear equation in two variables. (ii) How many solutions are possible for this equation. (iii) Find the two solution of equation formed in part (i)	**4**

OSDAV Public School, Kaithal
Half yearly Exams (2024-25)
Class: IX
Subject: MATHEMATICS

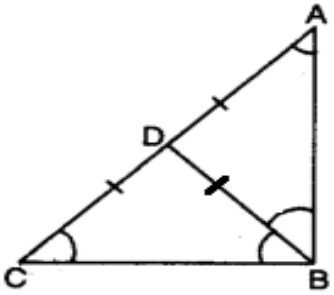
SET-B

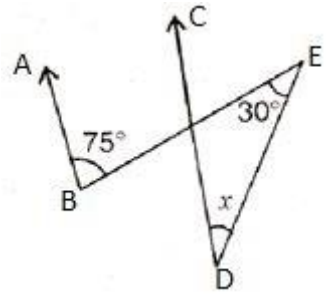
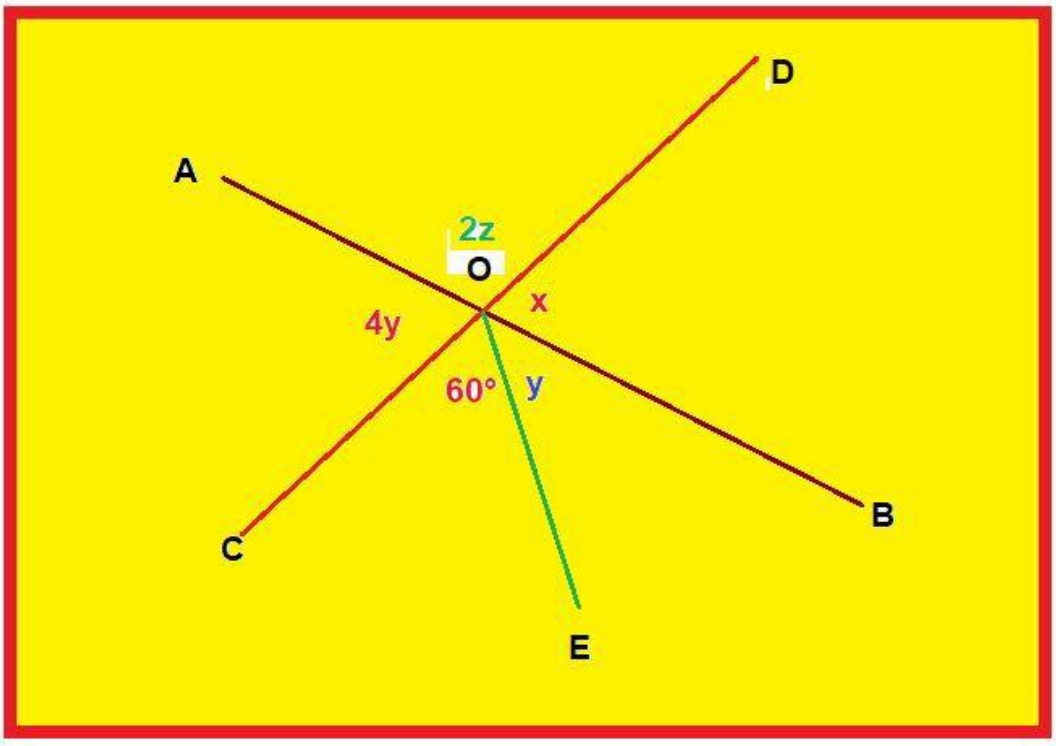
Time: 3 Hrs. **M.M.: 80**

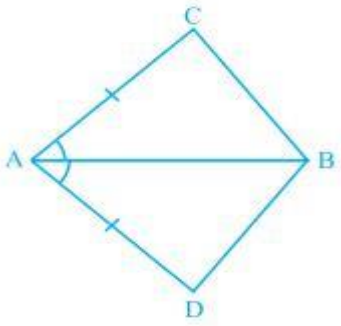
General Instructions:-

I. **All questions are compulsory.**
II. This Question Paper has 5 Sections A-E.
III. Section **A** has 20 MCQs carrying 1 mark each
IV. Section **B** has 5 questions carrying 02 marks each.
V. Section **C** has 6 questions carrying 03 marks each.
VI. Section **D** has 4 questions carrying 05 marks each.
Section **E** has 3 case based integrated units of assessment (04 marks each) with sub-parts of the values of 1, 1 and 2 marks each respectively

Q.N.	Questions	Marks
	SECTION A	
1	The rational number between 5 and 6 is (a) 1/2 . (b) 11/2 (c) 5/2 (d) None of these	**1**
2	The perimeter of an equilateral triangle is 60m. the area of triangle is (a) $10\sqrt{3}$ m² (b) $15\sqrt{3}$ m² (c) $20\sqrt{3}$ m² (d) $100\sqrt{3}$ m²	**1**
3	x = 9, y = 1 is a solution of the linear equation: (a) 2x + y = 14 (b) 3x – 2y = 25 (c) x + 2y = 14 (d) x + y = 14	**1**
4	Are -4 and 4 are zeroes of the polynomial x+4 ? (a) Only -4 is zero (b) Only 4 is zero (c) no, none is zero (d) Yes both are zeroes	**1**
5	Which of the following is not a criterion for congruence of triangles? (a) SAS (b) ASA (c) SSA (d) SSS	**1**
6	If the *y*-coordinate of a point is zero, then this point lies: (a) In II quadrant (b) In I quadrant (c) On x-axis (d) On y-axis	**1**
7	The number 4.43434343……..... is (a) a natural number (b) a whole number (c) a rational number (d) an irrational number	**1**
8	In two triangles ABC and DEF, AC = DF, AB = DE, and BC = EF so ΔABC ≅ Δ DEF by which congruence rule. (a). SSS Congruence rule (b) SAS Congruence rule (c) . RHS Congruence rule (d) None of these	**1**
9	A point both of whose co-ordinates are Positive lies in (a) quadrant II and IV (b) quadrant I and III (c) quadrant III only (d) quadrant I only	**1**
10	In ΔPQR ∠R = ∠P and QR = 4 cm and PR = 5cm then length of PQ is (a) 4cm (b) 2cm (c) 5cm (d) 2.5 cm	**1**
11	Euclid's stated that all right angles are equal to each other in the form of (a) an axiom (b) a definition (c) a postulate (d) a proof	**1**
12	Write the supplement of 100° (a) 60° (b) 80° (c) 180° (d) None of these	**1**
13	The number of Euclid postulate is (a) 5 (b) 3 (c) 6 (d) 4	**1**
14	The length of each side of an equilateral triangle having an area of $9\sqrt{3}$cm² is (a) 8cm (b) 36cm (c) 4cm (d) 6cm	**1**

15	Write the degree of the given polynomial $x^3 - 3x^2 - 5x + 8$ (a) 5 (b) 2 (c) 3 (d) None of the above	**1**
16	Find b, if x = 5, y = 0 is a solution of the equation $3x + 5y = b$ (a)8 (b) 10 (c)15 (d) none of these	**1**
17	The polynomial $2x - x^2 + 5$ is (a) an equation (b) a trinomial (c)a binomial (d) a monomial	**1**
18	Let x and y be rational and irrational number respectively. Then x+ y is necessarily (a) whole number (b) a rational number (c) an irrational number (d) a natural number	**1**
19	**Assertion:** The value of $98 \times 102 = 9996$ **Reason:** $(a+b)(a-b) = a^2 - b^2$ (a.) Both Assertion and Reason are correct and Reason is the correct explanation for Assertion (b.) Both Assertion and Reason are correct and Reason is not the correct explanation for Assertion. (c.) assertion is true but the reason is false. (d.) assertion is false but reason is true	**1**
20	**Assertion**: 33 is a composite number. **Reason** : 33 is an odd number. (a.) Both Assertion and Reason are correct and Reason is the correct explanation for Assertion (b.) Both Assertion and Reason are correct and Reason is not the correct explanation for Assertion. (c.) assertion is true but the reason is false. (d.) assertion is false but reason is true	**1**
	SECTION B	
21	Write $2x = -5y - 4$ in the form of $ax + by + c = 0$. Also write value of a, b and c.	**2**
22	Express 1.135135135…… in form p/q where p and q are integers and $q \neq 0$	**2**
23	Expand $(998)^3$ by suitable identity.	**2**
24	If a point C lies between two points A and B such that AC = BC , then prove that AC = ½AB. Explain by drawing the figure.	**2**
25	In right Δ ABC right angled at A, side AB = side AC. Find ∠B and ∠C	**2**
	SECTION C	
26	Find three solutions of equation $2x - 3y = 18$	**3**
27	The perimeter of triangular field is 450 m and its sides are in the ratio 13 : 12 : 5. Find the area of the triangle.	**3**
28	Factorize $x^3 + 2x^2 - x - 2$	**3**
29	If $\frac{3+\sqrt{5}}{3-\sqrt{5}} = a + b\sqrt{5}$. Find value of a and b .	**3**
30	Plots the points A(4,1) ,B(0,-3), C(2,-6), D(-5,5), E(-1,-2) and F(6,0) on the graph paper.	**3**
31	In a triangle ABC, D is midpoint of side AC such that BD = ½AC then show that ∠ ABC is a right angle.  	**3**

	SECTION D	
32	(i) Prove that if two lines intersect at a point then the vertically opposite angles are equal. (ii) In the given figure AB || CD, find value of x.  	**5**
33	(i) √Represent √2 on the number line. (ii) Simplify : $3\sqrt{45} - \sqrt{125} + \sqrt{200} - \sqrt{50}$	**5**
34	Find a and b so that polynomial $f(x) = x^3 - ax^2 - 13x + b$ has (x -1) and (x -2) as factors.	**5**
35	Find the area of a triangle whose perimeter is 180 cm and its two sides are 80 cm and 18 cm. Calculate the altitude of triangle corresponding to its shortest side.	**5**
	SECTION E	
36	Maths teacher draws a straight line AB shown on the blackboard as per the following figure.  Now he told Raju to draw another line CD as in the figure The teacher told Ajay to mark ∠AOD as 2z Suraj was told to mark ∠AOC as 4y Clive Made an angle ∠COE = 60° Peter marked ∠BOE and ∠BOD as y and x respectively. Now answer the following questions on the basis of above information (i) What is the value of ∠BOD? (ii) Find the value of ∠BOA (iii) What is the measure of ∠AOE ?	**4**

37	Mrs Sukanya, a Maths teacher was explaining the topic of congruency of triangle by paper folding method. she took a quadrilateral shaped original sheet ACBD and folded it in a such a way from point A and B that AB bisects angle A and AC = AD  Now answer the following questions on the basis of above information (i). why is ∠CAB= ∠DAB? (ii) ΔABC and ΔABD are congruent by which congruence criteria. (iii) Show that $\Delta ABC \cong \Delta$ ABD	**4**
38	On 15th birthday Rahul gave party to his friends. He purchased 2 pizzas and 4 burgers from school canteen and paid Rs 1000. Based on above information answer the following questions. (i) Form the linear equation in two variables. (ii) How many solutions are possible for this equation. (iii) Find the two solution of equation formed in part (i)	**4**

OSDAV Public School, Kaithal
Half yearly Exams (2024-25)
Class : IX
Subject : MATHEMATICS (Answer key)

SET-A

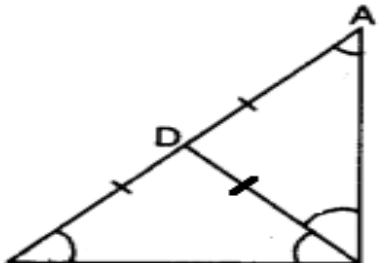
Time: 3 Hrs . M.M. : 80

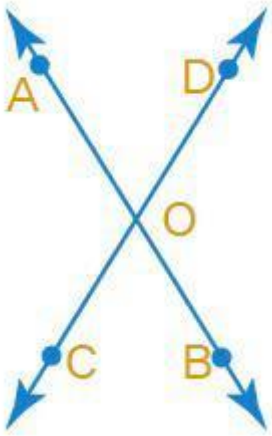
General Instructions:-

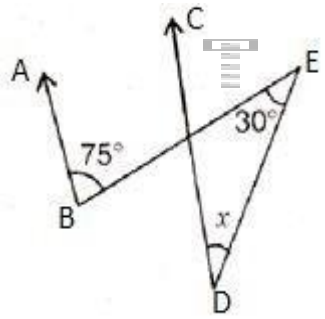
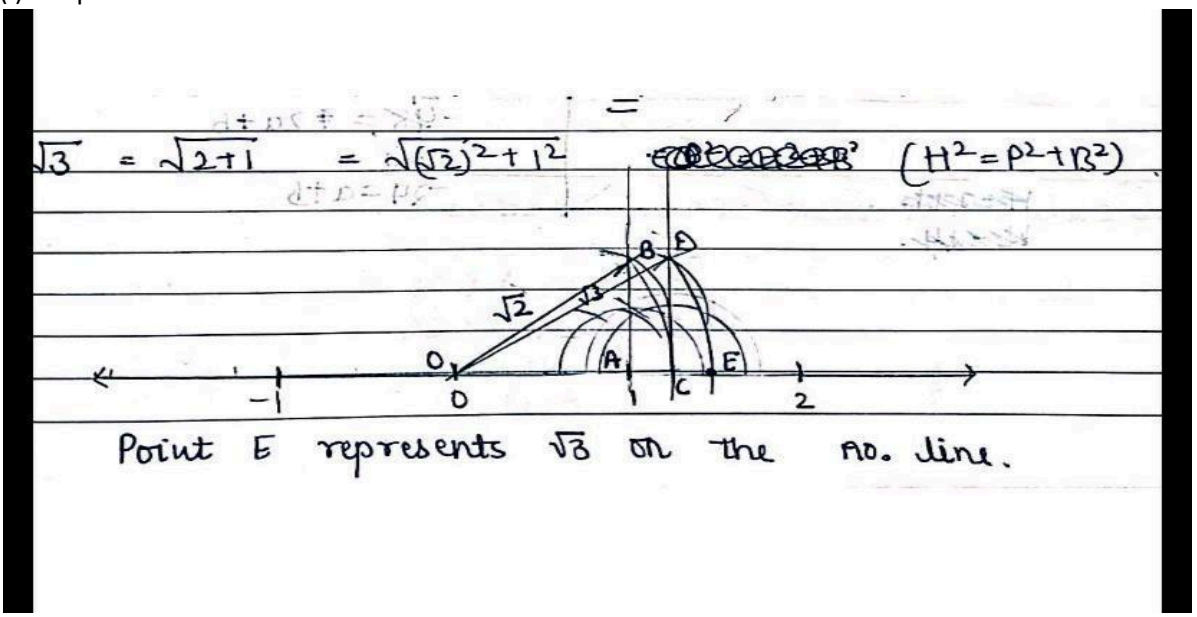
I. All questions are compulsory.
I. This Question Paper has 5 Sections A-E.
II. Section A has 20 MCQs carrying 1 mark each
III. Section B has 5 questions carrying 02 marks each.
IV. Section C has 6 questions carrying 03 marks each.
V. Section D has 4 questions carrying 05 marks each.
Section E has 3 case based integrated units of assessment (04 marks each) with sub-parts of the values of 1, 1 and 2 marks each respectively

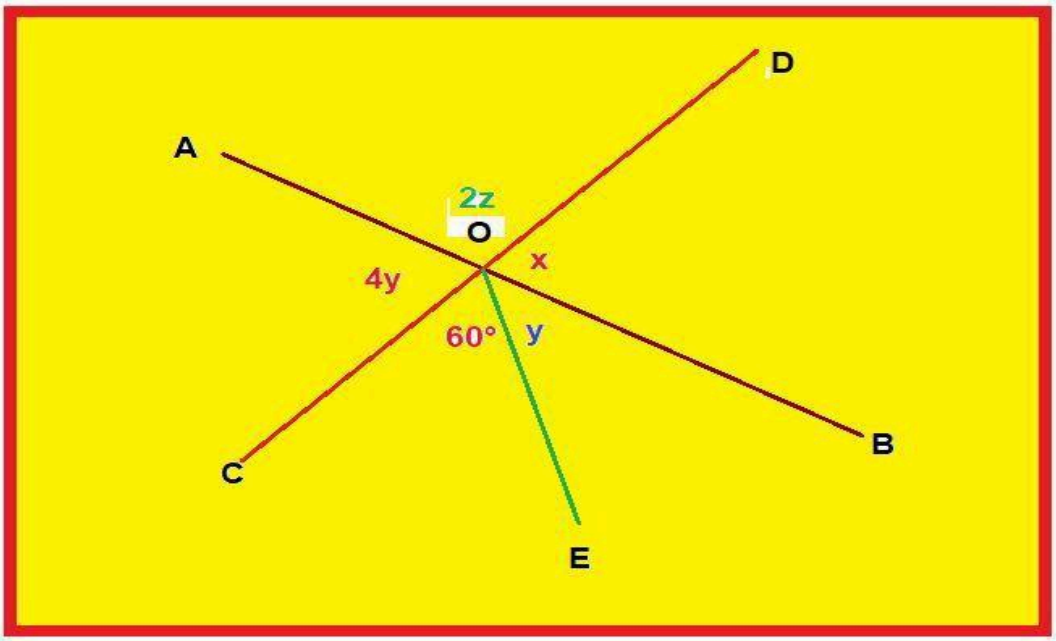
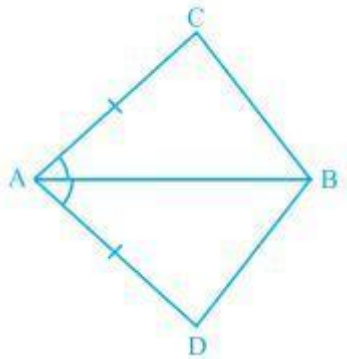
Q.N.	Questions	Marks
	SECTION A	
1	(c) 15/2	1
2	(c) $225\sqrt{3}$ m²	1
3	(c) x + 2y = 9	1
4	(a) Only -3 is zero	1
5	(c) quadrant III only	1
6	(d) On y-axis	1
7	(c) a rational number	1
8	(b) SAS Congruence rule	1
9	(b) ASA	1
10	(d) 50,50	1
11	(b) second	1
12	(b) 20°	1
13	(b) 7	1
14	(b) Obtuse Angle Triangle	1
15	(c) - 3	1
16	(b) 10	1
17	(b) a quadrinomial	1
18	(c) an irrational number/ (b) rational number	1
19	(a.) Both Assertion and Reason are correct and Reason is the correct explanation for Assertion.	1
20	(b.) Both Assertion and Reason are correct and Reason is not the correct explanation for Assertion.	1
	SECTION B	
21	Write 4x = - 8y + 4 in the form of ax+by+c=0 4x + 8y - 4 = 0. a = 4, b = 8 and c = -4	 ½ ½ x3
22	Express 2.235235235…… in form p/q where p and q are integers and q ≠ 0 Let x = 2.235235235..... eq.1 1000x = 2235.235235..... eq2 Subtracting eq.1 from eq. 2, we get x = 2233/999	 1 1
23	Expand $(995)^3$ by suitable identity. $(1000 - 5)^3$ $= (1000)^3 - 5^3 - 3.1000.5(1000 - 5)$	 ½ 1

	= 985074875	½
24	If Q is midpoint of line segment AB and P is midpoint of AQ then , show that PQ = 1/4AB AQ = 1/2AB (because Q is mid point of AB) AP = 1/2AQ (because P is mid point of AQ) As QB=AQ Adding AQ on both sides QB+AQ=AQ+AQ (Equals are added to equals then wholes are equal) AB = 2AQ AB=2(2PQ) AB= 4PQ 1/4AB=PQ	½ ½ 1
25	The sum of two angles of a triangle is 80° and their difference is 20°. Find all the angles of a triangle Let angles of triangle are A, B , C A + B = 80° .....eq.1 A – B = 20° .....eq.2 A + B + C = 180° (by angle sum property of triangle) Solving eq. 1 and eq. 2 A = 50° , B = 30° and C = 100°	½ ½ x3
	SECTION C	
26	Find three solutions of equation 3x - 2y = 24 1 mark for each right solution.	1x3
27	The perimeter of triangular field is 540 m and its sides are in the ratio 12 : 17: 25. Find the area of the triangle. 12x + 17x + 25x = 540 54x = 540 x = 10 sides are 120, 170 ,250 semiperimeter=540÷2 = 270 Area = $\sqrt{s\,(s-a)(s-b)(s-c)}$ $= \sqrt{270\,(270-120)(270-170)(270-250)}$ $= \sqrt{270\,X\,150\,X\,100\,x20}$ = 9000 cm²	1 ½ ½ 1
28	Factorise $x^3 - 6x^2 + 3x + 10$ Factors of constant term are $\pm1, \pm2, \pm4, \pm5, \pm10$ Put x = -1 in the polynomial Rem. = 0 so (x + 1) is the factor of given polynomial $x^3 - 6x^2 + 3x + 10 \div (x + 1) = x^2 - 7x + 10$ $x^2 - 7x + 10 = (x - 5)(x - 2)$ $x^3 - 6x^2 + 3x + 10 = (x + 1)(x - 5)(x - 2)$	3 1 1 1
29	If $\frac{4+\sqrt{5}}{4-\sqrt{5}} = a + b\sqrt{5}$. Find value of a and b . If $\frac{4+\sqrt{5}}{4-\sqrt{5}} \times \frac{4+\sqrt{5}}{4+\sqrt{5}} = \frac{16+5+8\sqrt{5}}{4^2-(\sqrt{5})^2} = \frac{21+8\sqrt{5}}{11}$ a = 21/11 and b = 8/11	2 1
30	Plots the points A(6,2) ,B(3,-5), C(0,-4), D(-2,2), E(-3,-2) and F(5,0) on the graph paper. For each right plotting ½ marks	3 ½(6)
31	In a triangle ABC, D is midpoint of side AC such that BD = ½AC then show that ∠ ABC is a right angle. D is the midpoint of AC. AD = CD	



	BD=1/2AC.....(1) AC = AD + CD AC = 2AD or 2CD (as AD=CD) So, AD = CD = 1/2 AC ---------- (2) Comparing (1) and (2), AD = CD = BD ---------- (3) Considering triangle DAB, From (3), AD = BD We know that the angles opposite to the equal sides are equal. ∠ABD = ∠BAD ---------- (4) Considering triangle DBC, From (3), BD = CD We know that the angles opposite to the equal sides are equal. ∠BCD = ∠CBD ---------- (5) Considering triangle ABC, By angle sum property, ∠ABD+∠DBC + ∠BAC + ∠ACB = 180° As ∠BAC = ∠BAD As ∠ACB = ∠DCB Now, 2(∠ABD + ∠DBC) = 180° ∠ABC=90°	1 ½ 1 ½
	SECTION D	
32	(i) Prove that if two lines intersect at a point then the vertically opposite angles are equal.  Given/To Prove Consider ray OA that stands on the line CD We know that the linear pair of angles is equal to 180 degrees. ∠AOC + ∠AOD = 180° ---------- (1) Consider ray OD that stands on the line AB ∠AOD + ∠DOB = 180° ---------- (2) Considering ray OB that stands on the line CD ∠DOB + ∠BOC = 180° ---------- (3) From (1) and (2), ∠AOC + ∠AOD = ∠AOD + ∠DOB Canceling common term, ∠AOC = ∠DOB From (2) and (3), ∠AOD + ∠DOB = ∠DOB + ∠BOC Canceling common term, ∠AOD = ∠BOC Hence proved.	½ ½ 1 ½ ½

	(ii) In the given figure AB || CD, find value of x.  ∠1=75° (corresponding angle) ∠1=x+30°(exterior angle property) x=45°	1 1
33	(i) √Represent √3 on the number line.  (ii) Simplify : $8\sqrt{242} - 5\sqrt{50} + 3\sqrt{98}$ $=8 \times 11\sqrt{2} - 5\times 5\sqrt{2} + 3\times 7\sqrt{2}$ $=88\sqrt{2} - 25\sqrt{2} + 21\sqrt{2} = 84\sqrt{2}$	3 1 ½ ½
34	Find the value of a and b so that polynomial $f(x) = x^3 + 10x^2 + ax + b$ is exactly divisible by (x -1) and (x -2) . $P(x) = x^3 + 10x^2 + ax + b$ Since P(x) is exactly divisible by (x —1) it means that P(1) = 0 $P(1) = 1^3 + 10 . 1^2 + a. 1 + b = 0$ $=> 1 + 10 + a + b = 0$ $=> a + b = —11$ ————————-(1) P(x) is also exactly divisible by (x —2), P(2) = 0 $P(2) = 2^3 + 10. 2^2 + 2a + b = 0$ $=> 8 + 40 + 2a + b = 0$ $=> 2a + b = — 48$ ————————-(2) Subtracting (1) from (2) we get $2a + b — a — b = — 48 —(—11)$ $=> a = —37$ and $b = +26$	 1 ½ 1 ½ 1,1
35	Find the area of a triangle whose perimeter is 360cm and its two sides are 160cm and 36cm. Calculate the altitude of triangle corresponding to its shortest side. Third side = 360 – 160 – 36 = 164cm S = 360/2 = 180	 1 1

	Area = 2880cm² Height = 2 x area / base = 2x 2880/36 = 160 cm	2 1
	SECTION E	
36	Maths teacher draws a straight line AB shown on the blackboard as per the following figure.  Now he told Raju to draw another line CD as in the figure The teacher told Ajay to mark ∠AOD as 2z Suraj was told to mark ∠AOC as 4y Clive Made an angle ∠COE = 60° Peter marked ∠BOE and ∠BOD as y and x respectively. Now answer the following questions on the basis of above information (i) What is the value of ∠BOE = 4y+y+60°= 180° y=24° (ii) What is the value of ∠AOD ∠AOD=∠BOC (vertically opposite angle) ∠AOD = 84° (iii) What is the measure of x + y 4y=x x=96° x+y=96° + 24° = 120°	 1 1 1 1
37	Mrs Sukanya, a Maths teacher was explaining the topic of congruency of triangle by paper folding method. she took a quadrilateral shaped original sheet ACBD and folded it in a such a way from point A and B that AB bisects ∠A and AC = AD  Now answer the following questions on the basis of above information	

	(i) why is ∠CAB= ∠DAB ? Because AB bisects angle A. (ii) ΔABC and ΔABD are congruent by which congruence criteria. By SAS congruence criteria. (iii) Show that $\Delta ABC \cong \Delta$ ABD AC = AD (Given) ∠CAB = ∠DAB (AB bisect ∠A) AB = AB(Common) $\Delta ABC \cong \Delta$ ABD	1 1 2
38	On 15th birthday Aryan gave party to his friends. He purchased 4 pizzas and 2 burgers from school canteen and paid Rs 800 Based on above information answer the following questions (i) Form the linear equation in two variables. Let cost of pizza = x Cost of burger = y 4x + 2y = 800 (ii) How many solutions are possible for this equation. Infinite (iii) Find the two solution of equation formed in part (i). One mark for each right solution.	1 1 1,1

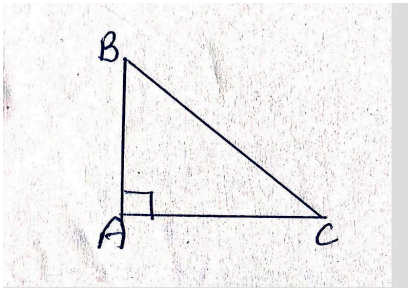
OSDAV Public School, Kaithal
Half yearly Exams (2024-25)
Class : IX
Subject : MATHEMATICS(Answer Key)
Time: 3 Hrs .

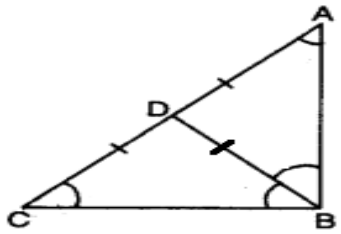
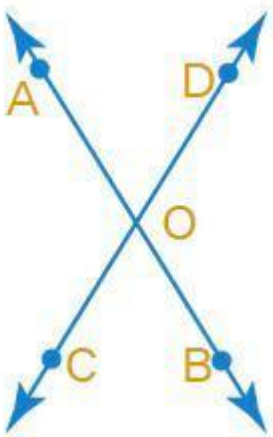
SET-B

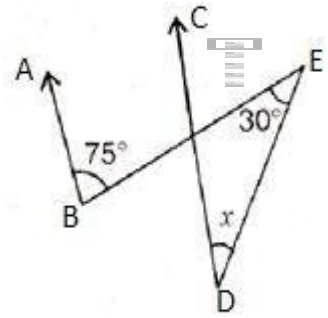
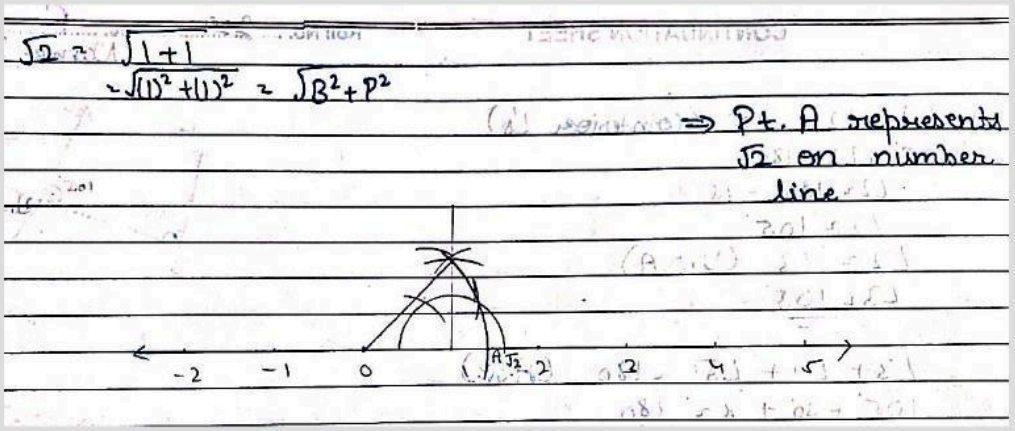
M.M.80

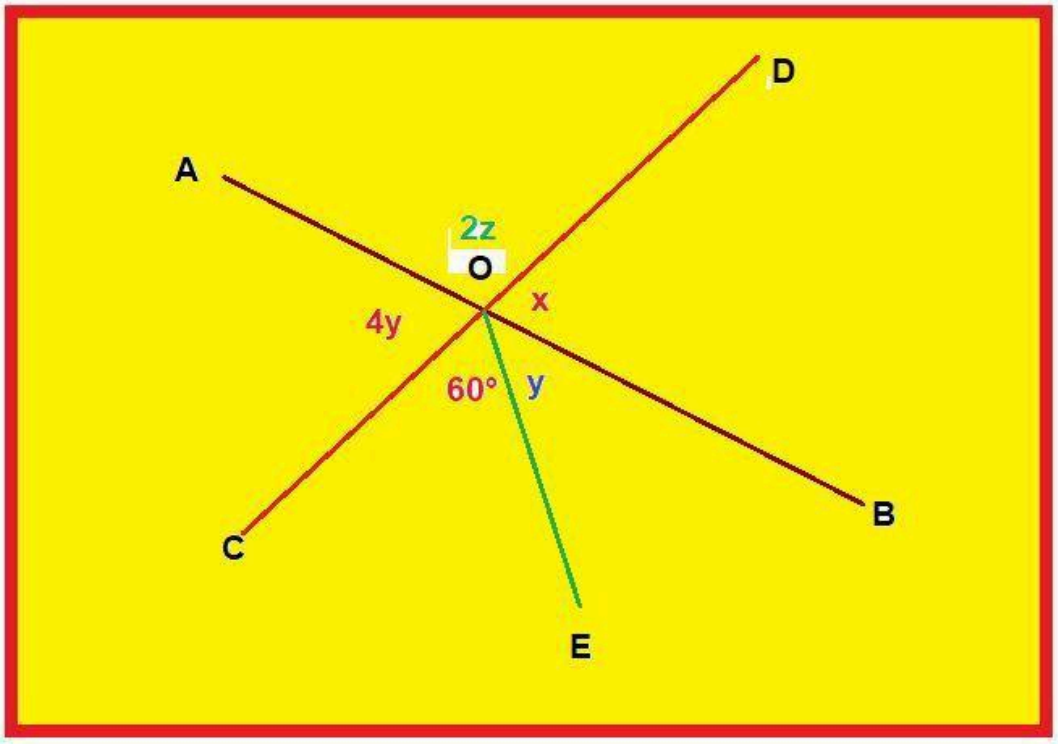
General Instructions:-
All questions are compulsory.
This Question Paper has 5 Sections A-E.
Section A has 20 MCQs carrying 1 mark each
Section B has 5 questions carrying 02 marks each.
Section C has 6 questions carrying 03 marks each.
Section D has 4 questions carrying 05 marks each.
Section E has 3 case based integrated units of assessment (04 marks each) with sub-parts of the values of 1, 1 and 2 marks each respectively

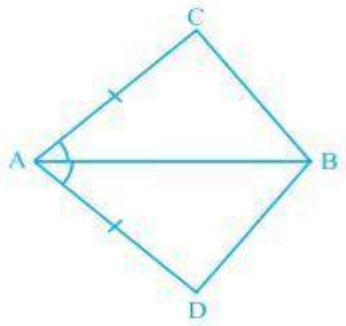
Q.N.	Questions	Marks
	SECTION A	
1	(b) 11/2	1
2	(d) $100\sqrt{3}$ m²	1
3	(b) $3x - 2y = 25$	1
4	(a) Only -4 is zero	1
5	(c) SSA	1
6	(c) On x-axis	1
7	(c) a rational number	1
8	(a) SSS Congruence rule	1
9	(d) quadrant I only	1
10	(a) 4cm	1
11	(c) a postulate	1
12	(b) 80°	1
13	(a) 5	1
14	(d) 6cm	1
15	(c) 3	1
16	(c)15	1
17	(b) a trinomial	1
18	(c) an irrational number	1
19	(a.) Both Assertion and Reason are correct and Reason is the correct explanation for Assertion	1
20	(b.) Both Assertion and Reason are correct and Reason is not the correct explanation for Assertion.	1
	SECTION B	
21	Write $2x = -5y - 4$ in the form of $ax+by+c=0$ $2x + 5y + 4 = 0$ $a = 2$, $b = 5$ and $c = 4$	 ½ 1 ½
22	Express $1.135135135\ldots\ldots$ in form p/q where p and q are integers and $q \neq 0$ Let $x = 1.135135135.....$ eq.1 $1000x = 1135.135135.....$ eq2 Subtracting eq.1 from eq. 2, we get $x = 1134/999$ $= 42/37$	 ½(4)
23	Expand $(998)^3$ by suitable identity. $= (1000 - 2)^3$ $= (1000)^3 - 2^3 - 3.1000.2(1000 - 2)$ $= 994011992$	 ½ 1 ½
24	If a point C lies between two points A and B such that AC = BC , then prove that	

	AC = ½AB. Explain by drawing the figure. AC = BC Adding AC on both sides, we get According to Euclid's axioms, we know that when equals are added to equals, the wholes are equal. ⇒ AC + AC = BC + AC ⇒ 2 AC = AB ⇒ AC = 1/2 AB	½(4)
25	In right Δ ABC right angled at A, side AB = side AC. Find ∠B and ∠C It is given that, AB = AC ∴ ∠C = ∠B (Angles opposite to equal sides are also equal) Let ∠B = ∠C = x In ΔABC, ∠A + ∠B + ∠C = 180° (Angle sum property of a triangle) 90°+ x + x = 180° 90°+ 2x = 180° 2x = 90° x = 45° ∴ ∠B = ∠C = 45° 	½ ½ 1
	SECTION C	
26	Find three solutions of equation 2x - 3y = 18 1 mark for each right solution.	1x3
27	The perimeter of triangular field is 450 m and its sides are in the ratio 13 : 12 : 5. Find the area of the triangle. 13x + 12x + 5x = 450 30x = 450 x = 15 sides are 195,180,75 semi perimeter= 225 Area = $\sqrt{s\,(s-a)(s-b)(s-c)}$ $= \sqrt{225\,(225-195)(225-180)(225-75)}$ $= \sqrt{225\,X\,30\,X\,45\,X\,150}$ = 6750 cm²	1 ½ ½ 1
28	Factorize $x^3 + 2x^2 - x - 2$ Factors of constant term are ±1 , ±2 , ±4, ±5 , ±10 Put x = 1 in the polynomial Rem. = 0 so (x - 1) is the factor of given polynomial $x^3 + 2x^2 - x - 2 \div (x - 1) = x^2 + 3x + 2$ $x^2 + 3x + 2 = (x + 1)(x + 2)$ $x^3 - 2x^2 - x - 2$ Three factors are (x +1)(x -1)(x +2)	1 1 1
29	If $\frac{3+\sqrt{5}}{3-\sqrt{5}} = a + b\sqrt{5}$. Find value of a and b . If $\frac{3+\sqrt{5}}{3-\sqrt{5}} \times \frac{3+\sqrt{5}}{3+\sqrt{5}} = \frac{9+5+6\sqrt{5}}{3^2-(\sqrt{5})^2} = \frac{14+6\sqrt{5}}{4}$ a = 7/2 and b = 3/2	2 1
30	Plots the points A(4,1) ,B(0,-3), C(2,-6), D(-5,5), E(-1,-2) and F(6,0) on the graph paper. ½ mark for each right plotting.	½(6)
31	In a triangle ABC, D is midpoint of side AC such that BD = ½AC then show that ∠ ABC is a right angle. D is the midpoint of AC.	

	 AD = CD BD=1/2AC.....(1) AC = AD + CD AC = 2AD or 2CD (as AD=CD) So, AD = CD = 1/2 AC ---------- (2) Comparing (1) and (2), AD = CD = BD ---------- (3) Considering triangle DAB, From (3), AD = BD We know that the angles opposite to the equal sides are equal. ∠ABD = ∠BAD ---------- (4) Considering triangle DBC, From (3), BD = CD We know that the angles opposite to the equal sides are equal. ∠BCD = ∠CBD ---------- (5) Considering triangle ABC, By angle sum property, ∠ABD+∠DBC + ∠BAC + ∠ACB = 180° As ∠BAC = ∠BAD As ∠ACB = ∠DCB Now, 2(∠ABD + ∠DBC) = 180° ∠ABC=90°	1 ½ 1 ½
	SECTION D	
32	(i) Prove that if two lines intersect at a point then the vertically opposite angles are equal.  Given/To Prove Consider ray OA that stands on the line CD We know that the linear pair of angles is equal to 180 degrees. ∠AOC + ∠AOD = 180° ---------- (1) Consider ray OD that stands on the line AB ∠AOD + ∠DOB = 180° ---------- (2) Considering ray OB that stands on the line CD ∠DOB + ∠BOC = 180° ---------- (3)	½ ½

	From (1) and (2), ∠AOC + ∠AOD = ∠AOD + ∠DOB Canceling common term, ∠AOC = ∠DOB From (2) and (3), ∠AOD + ∠DOB = ∠DOB + ∠BOC Canceling common term, ∠AOD = ∠BOC Hence proved. (ii) In the given figure AB || CD, find value of x.  ∠1=75° (corresponding angle) ∠1=x+30°(exterior angle property) x=45°	1 ½ ½ 1 ½ ½
33	(i) √Represent √2 on the number line.  (ii) Simplify : 3√45 - √125 + √200 - √50 3 x3√5 – 5√5 + 10√2 - 5√2 =9√5 - 5√5 +5√2 =4√5 + 5√2	3 1 ½ ½
34	Find a and b so that polynomial f(x) = $x^3 – ax^2 -13x + b$ has (x -1) and (x -2) as factors. Find the value of a and b so that polynomial f(x) = $x^3 -ax^2 + 13x + b$ is exactly divisible by (x -1) and (x -2) . P(x) = $x^3 -ax^2 -13 x + b$ Since P(x) is exactly divisible by (x —1) it means that P(1) = 0 P(1) = $1^3 - a . 1^2 - 13. 1 + b = 0$ = 1 -a -13 + b = 0 - a + b – 12=0 ————————-(1)	1 ½

	P(x) is also exactly divisible by (x —2), P(2) = 0 $P(2) = 2^3 - a.\ 2^2 - 13(2) + b = 0$ $= 8 - 4a - 26 + b = 0$ $-4a + b - 18 = 0$ ————————-(2) From (1) and (2) we get => a = —2 and b = 10	 1 ½ 1,1
35	Find the area of a triangle whose perimeter is 180 cm and its two sides are 80 cm and 18 cm. Calculate the altitude of triangle corresponding to its shortest side. Third side = 180 – 80 – 18 = 82cm S = 180/2 = 90 Area = $720cm^2$ Height = 2 x area / base = 2x 720/18 = 80 cm	 1 1 2 1
	SECTION E	
36	Maths teacher draws a straight line AB shown on the blackboard as per the following figure.  Now he told Raju to draw another line CD as in the figure The teacher told Ajay to mark ∠AOD as 2z Suraj was told to mark ∠AOC as 4y Clive Made an angle ∠COE = 60° Peter marked ∠BOE and ∠BOD as y and x respectively. Now answer the following questions on the basis of above information (i) What is the value of ∠BOD? 4y+y+60°= 180° (By straight angle) ∠BOD =∠AOC= 4y =4x 24 = 96° (ii) What is the value of ∠BOA ? ∠BOA = 180° (iii) What is the measure of ∠AOE ? ∠AOE =4y+60° =96°+60° =96° + 60° = 156°	 1 1 1,1

37	Mrs Sukanya, a Maths teacher was explaining the topic of congruency of triangle by paper folding method. she took a quadrilateral shaped original sheet ACBD and folded it in a such a way from point A and B that AB bisects angle A and AC = AD  Now answer the following questions on the basis of above information (i). why is ∠CAB= ∠DAB? Because AB bisects angle A. (ii) ΔABC and ΔABD are congruent by which congruence criteria. By SAS congruence criteria (iii) Show that $\Delta ABC \cong \Delta$ ABD AC = AD (Given) ∠CAB = ∠DAB (AB bisect ∠A) AB = AB(Common) $\Delta ABC \cong \Delta$ ABD	1 1 ½(4)
38	On 15th birthday Rahul gave party to his friends. He purchased 2 pizzas and 4 burgers from school canteen and paid Rs 1000. Based on above information answer the following question (i) Form the linear equation in two variables. Let cost of pizza =Rs. x Cost of burger = y 2x + 4y = 1000 (ii) How many solutions are possible for this equation. infinite (iii) Find the two solution of equation formed in part (i) One mark for each right solution.	1 1 1x2