


GOVERNMENT DEGREE COLLEGE, NARSAPUR, DIST.MEDAK  
DEPARTMENT OF MATHEMATICS

## Best Practices/Innovative Practices

The Department of Mathematics has collected paper clippings related to competitive exams, job related notifications information and maintained in the form of record as a Best Practice.

  
Principal  
**PRINCIPAL**  
**Govt. Degree College**  
NARSAPUR, Dist. Medak

# Father of Coordinate Geometry is?

## 1/2 Mark Questions

- The three vertices of a parallelogram taken in order are (-1, 0) (3, 1) (2, 2) respectively. Fourth vertex is  
A) (2, -1) B) (-2, 1) C) (1, 2) D) (2, 1)
- (-2, 4) point lie in  
A) First quadrant B) Second quadrant  
C) Third quadrant D) Fourth quadrant
- The given points are the vertices of a  
A(4, 4) B(3, 5) and C(-1, -1)  
A) Right triangle B) Equilateral triangle  
C) A, B D) None
- The area of the triangle with vertices (0, 0), (0, 2) and (2, 0) is  
A) 0 B) 1 Sq units  
C) 2 Sq. units D) 4 Sq. units
- Father of the coordinate geometry is  
A) Sir Ronald A. Fisher B) Bhaskara  
C) G.H. Hardy D) Rene Descartes
- Vertices of a triangle PQR is P(6, 3), Q(-2, 5) and R(-1, 7). Centroid is  
A) (1, 5) B) (3, 15)  
C) (5, 1) D) (-1, 5)
- Coordinates of the point which divides the line joining (5, -2) and (9, 6) in the ratio 3 : 1 is  
A) (4, 8) B) (-8, 4) C) (8, 4) D) (-4, 8)
- The point on the X-axis is equidistance from (7, 6), (-3, 4) is  
A) (7, 0) B) (-3, 0) C) (0, 3) D) (3, 0)
- The distance between (8, 4), (10, 4) is  
A) -2 B) 2 C) 18 D) 9
- The slope of the line joining (3, 8), (3, 5) is  
A) 0 B) -3 C) not defined D) 1

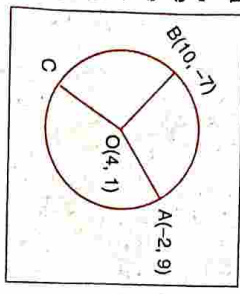
### Answers

- 1-B 2-B 3-A 4-C 5-D 6-A 7-C 8-D 9-B 10-C

## Co-ordinate Geometry

### Four Marks Questions

1. If a centre of a circle is O(4, 1), the other three points are lie in the circumference is A(-2, 9) B(10, -7) C(12, -5). Is OA = OB = OC?



### Writer

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Subject Expert



**Sol:** Now, we have to find out the distance between OA, OB, OC

$$OA = \sqrt{(-2-4)^2 + (9-1)^2} = \sqrt{(-6)^2 + (8)^2}$$

$$= \sqrt{36 + 64} = \sqrt{100} = 10$$

$$OB = \sqrt{(10-4)^2 + (-7-1)^2}$$

$$= \sqrt{(6)^2 + (-8)^2}$$

$$= \sqrt{36 + 64} = \sqrt{100} = 10$$

$$OC = \sqrt{(12-4)^2 + (-5-1)^2} = \sqrt{(8)^2 + (-6)^2}$$

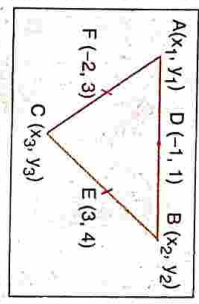
$$= \sqrt{64 + 36} = \sqrt{100} = 10$$

$$\therefore OA = OB = OC$$

That means these are radius of a circle, they are always equal.

2. The mid-point of the sides of a triangle ABC

are (-1, 1) (3, 4) and (-2, 3). Find the co-ordinates of the vertices of the triangle.



**Sol:** If the mid points of the sides of a triangle ABC are D(x4, y4) E(x5, y5) F(x6, y6) then the vertices

$$A = (x_4 + x_6 - x_5, y_4 + y_6 - y_5)$$

$$= (-1 - 2 - 3, 1 + 3 - 4) = (-6, 0)$$

$$B = (x_4 + x_5 - x_6, y_4 + y_5 - y_6)$$

$$= (-1 + 3 - (-2), 1 + 4 - 3) = (4, 2)$$

$$C = (x_5 + x_6 - x_4, y_5 + y_6 - y_4)$$

$$= (-2 + 3 - (-1), 3 + 4 - 1) = (2, 6)$$

3. Find the coordinates of the points which trisect the line joining (0, -5), (-3, 4), and A, B be the points of trisection.

**Sol:** Let P(0, -5), Q(-3, 4) be the given points and A, B be the points of trisection.

$$\therefore \text{We have } \frac{PA}{AQ} = \frac{1}{2}$$

$$P(0, -5) \quad A \quad B \quad Q(-3, 4)$$

$$\therefore PA : AQ = 1 : 2 \text{ that means A divides } \frac{m_1}{m_2}$$

PQ in the ratio 1 : 2 internally.

The coordinates of A are

$$\left( \frac{m_1 x_2 + m_2 x_1}{m_1 + m_2}, \frac{m_1 y_2 + m_2 y_1}{m_1 + m_2} \right)$$

$$= \left( \frac{1(-3) + 2(0)}{1+2}, \frac{1(4) + 2(-5)}{1+2} \right)$$

$$= \left( \frac{-3 - 4 - 10}{3}, \frac{-2}{3} \right) = (-1, -2)$$

Now B is the middle point of A, Q

$\therefore$  The coordinates of B are

### Rene Descartes



**Target-2020**  
**Tenth**  
**Mathematics Paper-II**

$$\left( \frac{1+(-3)}{2}, \frac{-2+4}{2} \right) = \left( \frac{-4}{2}, \frac{2}{2} \right) = (-2, 1)$$

4. Area of a triangle  $7\frac{1}{2}$  square units whose vertices are (3, 4), (2, -1) and (K, -6) then show that K = 4.

**Sol:** Area of a triangle

$$= \frac{1}{2} |x_1(y_2 - y_3) + x_2(y_3 - y_1) + x_3(y_1 - y_2)|$$

$$7\frac{1}{2} = \frac{1}{2} |3(-1 + 6) + 2(-6 - 4) + K(4 + 1)|$$

$$\frac{15}{2} = \frac{1}{2} |15 - 20 + 5K|$$

$$5K - 5 = 15; 5K = 15 + 5; 5K = 20$$

$$K = \frac{20}{5} = 4 \quad \therefore K = 4.$$

## Circles

### Two Marks Questions

1. If  $x^2 + y^2 + 2gx + 2fy - 12 = 0$  represent a circle with centre (2, 3) find g, f and radius.  
**Sol:** Centre  $(-g, -f) = (2, 3)$  (given)  
 $g = -2, f = -3$

radius  $(r) = \sqrt{g^2 + f^2 - c} = \sqrt{4 + 9 + 12} = 5$

2. Find the value of 'k'. If the points (4, 2) (k, -3) are conjugate with respect to the circle  $x^2 + y^2 - 5x + 8y + 6 = 0$

**Sol:** Points  $(x_1, y_1)$   $(x_2, y_2)$  are conjugate with respect to  $S = 0$  then  $S_{12} = 0$   
 $4k - 6 - \frac{5}{2}(4+k) - 4 + 6 = 0$   
 $\Rightarrow 3k - 28 = 0 \Rightarrow k = \frac{28}{3}$



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Subject Expert

Writer

3. If the length of the tangent from (5, 4) to the circle  $x^2 + y^2 + 2ky = 0$  is 1. Then find k.

**Sol:** Length of tangent from  $(x_1, y_1)$  to the circle  $S = 0$  is  $\sqrt{S_{11}}$

Given that  $\sqrt{S_{11}} = 1 \Rightarrow S_{11} = 1$

$25 + 16 + 8k = 1 \Rightarrow 8k = -40 \Rightarrow k = -5$

4. Find the equation of the normal at P(3, 5) to the circle  $x^2 + y^2 - 10x - 2y + 6 = 0$

**Sol:** P (3, 5) is a point on the circle  $x^2 + y^2 - 10x - 2y + 6 = 0$  with centre C (5, 1).

Equation of the normal at P is the line passing through P and C

$\therefore y - 5 = \frac{5-1}{3-5}(x-3) \Rightarrow 2x + y - 11 = 0$

$\therefore$  Equation of normal at P is  $2x + y - 11 = 0$

# Find angle between the circles..?

### Four Marks Questions

1. Find the equation of the circle with centre (-2, 3) cutting a chord length 2 units on  $3x + 4y + 4 = 0$

**Sol:** Given that length of chord AB = 2

M is the foot of C

(Centre) to AB

Now AM = MB = 1

CM = distance from

centre C(-2, 3) to the

chord  $3x + 4y + 4 = 0$

$\therefore CM = \frac{|-6 + 12 + 4|}{5} = \frac{10}{5} = 2$

In the right angled triangle AMC,

$AC^2 = AM^2 + MC^2 = 1 + 4 = 5 = (\text{radius of circle})^2$

$\therefore$  Equation of the circle is  $(x + 2)^2 +$

$(y - 3)^2 = 5$

$\Rightarrow x^2 + y^2 + 4x - 6y + 8 = 0$

2. Show that  $x + y + 1 = 0$  touches the circle  $x^2 + y^2 - 3x + 7y + 14 = 0$  and find its point of contact.

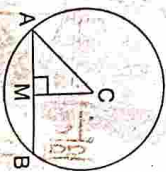
**Sol:** Centre of circle (C) =  $\left(\frac{3}{2}, \frac{7}{2}\right)$

radius of the circle (r) =  $\frac{1}{\sqrt{2}}$

distance from centre C  $\left(\frac{3}{2}, \frac{7}{2}\right)$  to

$x + y + 1 = 0$  is  $d = \frac{\left|\frac{3}{2} - \frac{7}{2} + 1\right|}{\sqrt{1+1}}$

$\therefore d = \frac{1}{\sqrt{2}}$



**Target-2020**  
Senior Inter  
Maths - IIB

Since  $r = d$

The line  $x + y + 1 = 0$  is tangent to the given circle

Let P (h, k) be the point of contact of the line and the circle. Now P is the foot of perpendicular from C to the tangent

$\frac{h - 3/2}{1} = \frac{k + 7/2}{1} = \frac{-(3/2 - 7/2 + 1)}{1 + 1}$

$h - 3/2 = k + 7/2 = \frac{1}{2}$

(h, k) = (2, -3)

$\therefore$  point of contact = (2, -3)

### 7 Marks Questions

1. If (2, 0) (0, 1) (4, 5) and (0, 0) are concyclic, then find c.

**Sol:** Given four points are A(2, 0) B(0, 1) C(4, 5) and D(0, 0) are concyclic

Let the equation of the circle passing through A, B, C is

$x^2 + y^2 + 2gx + 2fy + c = 0$

A(2, 0) lies on it,

we get  $4 + 4g + c = 0$

$\Rightarrow 4g + c = -4$  ..... (1)

B(0, 1) lies on it, we get

$1 + 2f + c = 0$

$\Rightarrow 2f + c = -1$  ..... (2)

C(4, 5) is also lies on it, we get

$16 + 25 + 8g + 10f + c = 0$

$\Rightarrow 8g + 10f + c = -21$  ..... (3)

By solving (1), (2), (3) we get  $g = \frac{-13}{6}$

$f = \frac{-17}{6}, c = \frac{14}{3}$

Now equation of the circle is

$x^2 + y^2 + \frac{13}{3}x - \frac{17}{3}y + \frac{14}{3} = 0$

$\Rightarrow 3x^2 + 3y^2 - 13x - 17y + 14 = 0$

substitute D(0, 0) in

$3x^2 + 3y^2 - 13x - 17y + 14 = 0$

$3c^2 - 17c + 14 = 0$

$\Rightarrow (c - 1)(3c - 14) = 0$

$\therefore c = 1$  (or)  $\frac{14}{3}$

$c = 1$  is not admissible and hence  $c = \frac{14}{3}$

				3			2
8	2			6	4		
							7
		3			9	6	2
	8	6				9	4
	9	5	6			8	
	6						
			1	5			3
4			2				4

### దైవీ సుదోకు-233

సుదోకు - 232 సమాధానం

9	6	4	1	5	7	8	3	2
8	7	3	6	9	2	4	1	5
2	5	1	8	3	4	7	9	6
4	8	6	5	2	9	3	7	1
5	3	7	4	8	1	2	6	9
1	2	9	7	6	3	5	4	8
6	9	2	3	7	5	1	8	4
3	4	5	9	1	8	6	2	7
7	1	8	2	4	6	9	5	3

ఎలా పూరించాలి?

ప్రతి బాక్స్ లో 9 గళ్ళు ఉంటాయి. నిలువుగా, అడ్డంగానూ ప్రతి లైనులోనూ 1 నుంచి 9 వరకు అంకెలను పూరించాలి. ఒకసారి పూరించిన అంకెను తిరిగి వాడకూడదు.

		3			2	1	5	9
			7			6		
			1	6				8
	2					8		
	1	5			8		9	
		6					4	
2				5	4			
		5			3			
4	7	8	9			5		

### దైవీ సుదోకు-207

సుదోకు - 206 సమాధానం

7	2	5	8	6	4	9	3	1
1	8	4	3	7	9	5	6	2
9	3	6	2	1	5	7	4	8
2	9	8	4	3	1	6	5	7
6	1	7	5	9	2	4	8	3
5	4	3	7	8	6	2	1	9
4	7	2	1	5	8	3	9	6
3	6	1	9	4	7	8	2	5
8	5	9	6	2	3	1	7	4

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	8	4		2				5	1
							7		
	9	2			8				
		6	3						
	4	7	9		6	2	3		
					2	4			
			4				5	2	
		5							
4	3			7			1	9	

### దైవీ సుదోకు-205

సుదోకు - 204 సమాధానం

4	7	2	3	1	9	8	6	5
8	6	9	2	5	4	7	1	3
5	3	1	8	6	7	4	2	9
9	5	6	1	4	2	3	7	8
7	2	3	9	8	6	5	4	1
1	8	4	7	3	5	6	9	2
6	1	7	5	9	3	2	8	4
3	4	8	6	2	1	9	5	7
2	9	5	4	7	8	1	3	6

ఎలా పూరించాలి?

ప్రతి బాక్స్ లో 9 గళ్ళు ఉంటాయి. నిలువుగా, అడ్డంగానూ ప్రతి లైనులోనూ 1 నుంచి 9 వరకు అంకెలను పూరించాలి. ఒకసారి పూరించిన అంకెను తిరిగి వాడకూడదు.

### దైవీ సుదోకు - 122

7				6		1		
							5	4
9			2		1			3
				7			2	
1		9				8		7
	6				3			
3			6		7			5
6	9							
		8		4				6

ఎలా పూరించాలి?

ప్రతి బాక్స్ లో 9 గళ్ళు ఉంటాయి. నిలువుగా, అడ్డంగానూ ప్రతి లైనులోనూ 1 నుంచి 9 వరకు అంకెలను పూరించాలి. ఒకసారి పూరించిన అంకెను తిరిగి వాడకూడదు.

సుదోకు - 121 సమాధానం

8	5	6	7	1	3	9	2	4
4	1	7	2	8	3	6	5	
2	3	9	5	1	6	7	8	1
6	9	5	3	7	4	8	1	2
7	4	8	1	6	2	5	3	9
3	2	1	8	9	5	4	7	6
9	6	4	4	8	7	1	5	3
1	8	3	2	5	9	6	4	7
5	7	3	9	3	1	2	9	8

9		7		8	6
	4	3		9	
			5	3	2
		4	2		
	3	1	9	7	
		6	7		
2	5	6			
4			2	3	
3	1		8		9

### దైని సుడోకు - 243

#### సుడోకు- 242 సమాధానం

8	4	8	1	5	2	7	3	9
2	7	1	3	9	6	4	8	5
5	9	3	8	7	4	1	2	6
8	1	5	6	4	7	3	9	2
9	3	4	5	2	8	6	7	1
7	2	6	9	3	1	5	4	8
4	6	9	7	8	5	2	1	3
3	5	7	2	1	9	8	6	4
1	8	2	4	6	3	9	5	7

ప్రతి బాక్స్ లో 9 గళ్లు ఉంటాయి. ఒక్కో బాక్స్ ను 1 నుంచి 9 వరకు అంకెలతో పూరించాలి. అన్ని బాక్స్ లనూ కలిపి చూస్తే నిలువుగా, అడ్డంగానూ ఏ లైనులోనూ ఒకసారి వాడిన అంకెను తిరిగి వాడకూడదు.

	4			2	7	3
		1	9			
5				4	1	
8			6			2
	3	4			6	7
7				1		8
		9	7			3
			1	8		
8	2	4				5

### దైని సుడోకు - 242

#### సుడోకు- 241 సమాధానం

4	7	1	5	9	3	8	6	2
8	6	5	2	4	1	7	3	9
9	3	2	7	8	6	4	5	1
2	5	4	1	7	9	3	8	6
1	8	7	6	3	5	2	9	4
3	9	6	8	2	4	1	7	5
7	1	9	3	5	2	6	4	8
6	4	3	9	1	8	5	2	7
5	2	8	4	6	7	9	1	3

ప్రతి బాక్స్ లో 9 గళ్లు ఉంటాయి. ఒక్కో బాక్స్ ను 1 నుంచి 9 వరకు అంకెలతో పూరించాలి. అన్ని బాక్స్ లనూ కలిపి చూస్తే నిలువుగా, అడ్డంగానూ ఏ లైనులోనూ ఒకసారి వాడిన అంకెను తిరిగి వాడకూడదు.