MASTER’S P.U COLLEGE, HASSAN, 573201.

KCET ONLINE TEST-16, APRIL-2020  **MATHEMATICS** **TIME: 45Mins MARKS: 30**

**TOPIC**: **STRAIGHT LINES & CIRCLES.**

**KEY**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
| **B** | **C** | **D** | **A** | **A** | **A** | **A** | **D** | **B** | **A** | **A** | **A** | **A** | **C** | **A** |
| 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 |
| **B** | **C** | **B** | **A** | **A** | **B** | **B** | **D** | **B** | **A** | **C** | **B** | **C** | **D** | **C** |

**HINTS AND SOLUTIONS**

1. (b) Slope of  Slope of *AB* = 1

B

E

C

D

A

(1,3)

(5,7)

(–5,7)

Hence equation of *AB* is.

1. (c) Required equation of median is  .
2. (d) The given line is 

Obviously it cuts -axis at (*a*, 0). The equation of line perpendicular to (i) is , but it passes through (*a*, 0) ⇒ .

Hence required equation of line is  *i.e.,* .

1. (a) The equation of any straight line passing through (3, –2) is  …..(i)

The slope of the given line is . So,  On solving, we get  or 

Putting the values of *m* in (i), the required equation of lines are and .

1. (a) The equation of lines passing through (1, 0) are given by . Its distance from origin is . ⇒  ⇒ . Hence the lines are  and .
2. (a) The gradient of line is . Now the equation of line passing through (–1,1) is  but .Therefore, required equation is .
3. (a) The given lines intersect at  and join of this with (*a*, *b*) will have slope . Now proceed.
4. (d)  and  ⇒ .
5. (b) Let *p* be the length of the perpendicular from the origin on the given line. Then its equation in normal form is or 

This meets the coordinate axes at  and . ∴ Area of 

By hypothesis . Hence the lines are .

1. (a) If the line is , then the intercepts on the axes are  and .

Therefore the area is  …..(i)

and hypotenuse is 5, therefore  …..(ii)

On solving (i) and (ii), we get

or and or 

Hence equation of line is or 

1. (a) According to the figure, diagonal *BD* is passing through origin, therefore its equation is given by



*A*(0,3)

*x*=0

*B*(0,0)

*x*+*y*=1

*C*(1,0)

**

D

⇒ .

1. (a) 

or , which represents a family of straight lines through point of intersection of and *i.e*, (– 1, – 2).

**Trick :** Point (–1, –2) satisfies the given equation of straight line.

1. (a) By the help of given condition of , the three lines reduce to  or . All these lines are parallel. Hence they do not intersect in finite plane.
2. (c)  Therefore, the lines are perpendicular.
3. (a) We know that 

Hence the line makes an angle of with *y*- axis, so the equation of *y*-axis is .

1. (b)  and  Hence the lines are parallel.
2. (c) Here , 

Hence 

.

1. (b)  

 =.

1. (a) Distance between lines  and  is , 

Distance between lines  and  is, 

Therefore .

1. (a) Given lines are concurrent, if .

This is true for all values of *a* because and are identical.

1. (b)  which meets on axes at , .

Therefore, the diagonals *AC* and *BD* of quadrilateral *ABCD* are perpendicular, hence it is a rhombus whose area is given by .

1. (b) Centre (1, 2) and since circle touches *x-*axis, therefore, radius is equal to 2.

Hence the equation is  .

1. (d) Infinite, as there is a family of co-axial circles.
2. (d) Obviously the centre of the circle is .

Therefore, the equation of circle is

.

1. a) Circle  is concentric with . Therefore centre is  and radius .
2. (c) Solving  and , we get , only option (c) satisfies the co-ordinate.
3. (b) The equation of circle through points (0, 0), (1, 3) and (2, 4) is



Point  will be on the circle, if





  or .

1. (c) The locus is a parabola as distance of centre from straight line = its distance from point (*a*, 0).
2. (d) According to equation,

.

1. (c) 

Again  ∴ 

Now =distance between centres.

 and







Two tangents can be drawn.