MTH103 List of Questions

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Q1 Find the equation to the straight line passing through the point of intersection of the lines 5x+6y +1 = 0 and 3x + 2y +5 =0 and perpendicular to the line 3x-5y+11 = 0

- 2x + 3y+4 = 0
- 5x + 3y+8 = 0
- 2x+4y+5 = 0
- 3x+ 2y+7 = 0

Q2 Given that vectors P=3i+4j+5k and Q=3i+4j+5k , \[P\dot Q\] is _____

- $$ x^{2}+y^{2}-6x-10y+25=0$$
- $$ x^{2}+y^{2}-5x-16y+34=0$$
- $$ x^{2}+y^{2}-3x+5y+10=0$$
- $$ x^{2}+y^{2}-2x-3y+15=0$$

Q3 The value point A(1, -1) inside the circle is \[x^{2}+y^{2}-3x+4y=12\] _____

- -17
- -13
- -15
- -12

Q4 Given that ellipse has equation of , the x and y intercepts of the of the equation are _____ and _____

- 2, 3
- 4, 5
- 3,6
- 3, 4

Q5 The focus of the parabola whose equation is \[y^{2}+32\] is _____

- F(-8,0)
- F(-6,0)
- F(-4,0)
- F(-5,0)

Q6 Given that ellipse has equation of\[9x^{2}+4y^{2}=36\] , the length of the minor axis is _____

- 6
- 8
- 7
- 10

Q7 Given the equation \[9x^{2}-16y^{2}=144\], the intersection on x-axis is _____

- 4
- 5
- 8
- 10

Q8 If a force of 30N acting in the east direction and another force of 40N acting in the north direction. Find the sum of the two vectors is _____

- 50N
- 60N
- 40N
- 100N

Q9 The directrix of the parabola $$ y= -\frac{1}{2} x^{2}$$ is _____

- 1/2
- 3/5
- 1/5
- 2/3

Q10 The focus of the parabola $$ y= -\frac{1}{2} x^{2}$$ is _____

- (0, ½)
- (0, 1/3)
- (0, 2/3)
- (0, 3/5)

Q11 If A=i+4j+7k and B=5i-2j+k, find \[A\times B\]

- 18i+34j-22k
- 22i-15j-10k
- 12i+4j-5k
- 2i-3j-25k

Q12 Find the equation of the circle with centre (3, 5) and radius 3

- $$ x^{2}+y^{2}-6x-10y+25=0$$
- $$ x^{2}+y^{2}-5x-16y+34=0$$
- $$ x^{2}+y^{2}-3x+5y+10=0$$
- $$ x^{2}+y^{2}-2x-3y+15=0$$

Q13 Find the equation of the tangent at the point (0, 2) to the circle $$x^{2}+y^{2}-4x+2y-8=0$$

- y=2/3 x+2
- y=1/3 x+5
- y=2x+7
- y=3x-1

Q14 Find the standard form of the equation for the parabola with vertex (3, 4) with focus (5, 4).

- \[(y-4)^2=8(x-3)\]
- \[(y+2)^2=8(x+5)\]
- \[(y-3)^2=8(x-5)\]
- \[(y+5)^2=8(x+1)\]

Q15 Given the equation \[9x^2-16y^2=144\]. Find the coordinate of the foci

- \[F_1 (5,0),F_2 (-5,0)\]
- \[F_1 (3,0),F_2 (-3,0)\]
- \[F_1 (2,0),F_2 (-2,0)\]
- F_1 (1,0),F_2 (-1,0)

Q16 Given that ellipse has equation of\ 9x^2+4y^2=36\], Find the length of the major axis

- 6
- 8
- 7
- 10

Q17 Find the equation of the parabola having vertex (0, 0), axis along the x-axis and passing through (2, -10)

- \[y^2=4 x\frac{1}{8}\]
- \[y^2=2x \frac{1}{2}\]
- \[y^2=4x\frac{1}{7}\]
- \[y^2=5x\frac{1}{8}\]

Q18 What is the focus in the equation \[y^2=5x\]

- \[(\frac{5}{4}, 0)\]
- \[(\frac{1}{2}, 2)\]
- \[(\frac{1}{4}, 3)\]
- \[(\frac{5}{7}, 5)\]

Q19 What is the equation of the directrix of the parabola whose equation is \[x^2-30y=0\]

- y=-7.5
- y=-5.5
- y=-3.5
- y=-2.5

Q20 Find the equation of the tangent to the circle\[x^2+y^2-2x+4y+15=0\] at the point (-1, 2)

- 2y=x+5
- y=3x+7
- 5y=5x+3
- 3x+2y=-1

Q21 Find the coordinates of point of contact between the two circles \[x^2+y^2+2x+6y=39\] and \[x^2+y^2-4x-2y+1=0\]

- \[(3\frac{1}{5}, 2\frac{3}{5})\]
- \[(3\frac{3}{5}, 4\frac{1}{5})\]
- \[(2\frac{4}{5}, 4\frac{2}{5})\]

- \[(5\frac{2}{5}, 3\frac{1}{5})\]

Q22 Find the parametric equations of a circle with centre (2, -1) and radius 3

- \[x=2+3 \cos\theta,~~ y=-1+3 \sin\theta\]
- \[x=-1+3 \cos\theta,~~ y=2+3 \sin\theta\]
- \[x=4+9\cos\theta,~~ y=1+9 \sin\theta\]
- \[x=1+9 \cos\theta,~~ y=4+9\sin\theta\]

Q23 Find the points of intersection of the circle x^2+y^2-x-3y=0 with the line y=x-1.

- (1, 0) and (2,1)
- (2, 0) and (0,1)
- (2, 3) and (2, 2)
- (3,1) and (3, 2)

Q24 Find the equation of the circle with circle with centre (-3, 4) which passes through the point (2, 5)

- \[x^{2}+y^{2}+6x-8y=1\]
- \[x^{2}+y^{2}+2x+3y-12=0\]
- \[x^2+y^2+3x-2y-5=0\]
- \[x^2+y^2+3x-5y-6=0\]

Q25 Find the equation of the circle with centre (�??2, 3) and radius 6

- \[x^{2}+y^{2}+4x-6y=23\]
- \[x^{2}+y^{2}+26x-y=3\]
- \[x^{2}+y^{2}+3x-2y=5\]
- \[x^{2}+y^{2}+25x-23y=10\]

Q26 Find the equation of the line through the point (-1, 2) which is perpendicular to y=2x-1

- \[y=-\frac{1}{2}x+\frac{3}{2}\]
- \[y=-\frac{3}{5}x+\frac{7}{3}\]
- \[y=-\frac{2}{3}x+\frac{3}{2}\]
- \[y=-\frac{1}{3}x+\frac{2}{3}\]

Q27 Find the angle between the two lines -3x+4y=8 and -2x-8y-14=0

- \[-14.63^{0}\]
- \[-15.45^{0}\]
- \[-12.37^{0}\]
- \[-24.63^{0}\]

Q28 A straight line has a gradient of 5/3 and it passes through the point (1,3). Find the intercept of the straight line on the y-axis

- -8/3
- -7/5
- -3/4
- -3/4

Q29 Find the sum of vectors \[\bar{AK}, \bar{KL}, \bar{LP}~~and ~~\bar{PQ}\]

- \[\bar{AQ}\]
- \[\bar{AP}\]
- \[\bar{AK}\]
- \[\bar{KP}\]

Q30 A straight line has a gradient of 5/3 and it passes through the point (1,3). Find the equation of the straight line

- 3y=5x-8
- 2y=6x-2
- y=2x-4
- 6y=x-3

Q31 Find the angle of slope of the line joining A(4,3) and B(9,7).

- \[38.66^{0}\]
- \[57.77^{0}\]
- \[55.87^{0}\]
- \[74.53^{0}\]

Q32 If A(3, 6) and B(4, 8) are two points on a line segment. Evaluate the coordinate of the midpoint of AB

- \[(3\frac{1}{2},7)\]
- \[(2,4)\]

- \[(1\frac{1}{2},3)\]
- (5,9)

Q33 Find the distance between the points A(4, 3) and B(6, 5)
- \[2\sqrt(2)\]
- \[\sqrt(3)\]
- \[5\sqrt(5)\]
- \[\sqrt(7)\]

Q34 If a=2i+4j+3k and b=i+5j-2k. Find the vector product a and b
- -23i+7j+6k
- -25i+9j+2k
- -22i+j+10k
- -5i+3j-4k

Q35 Find the magnitude of a components of vector\[\bar{AB}=5i+2j+4k\] expressed in terms of the unit vectors
- \[3\sqrt(5)\]
- \[2\sqrt(5)\]
- \[4\sqrt(5)\]
- \[7\sqrt(5)\]

Q36 Given that\[Z_1=2i-4j,~~Z_2=2i+6j ~~and~~ Z_3=3i-j\]. Evaluate\[Z_1-Z_2-Z_3\]
- 3i-9j
- -7i+j
- -5i-10j
- -i+6j

Q37 Find the sum of vectors \[\bar{AC}+ \bar{CL}-\bar{ML}\]
- \[\bar{AM}\]
- \[\bar{AL}\]
- \[\bar{AK}\]
- \[\bar{LM}\]

Q38 Evaluate the sum of vectors \[\bar{BC}- \bar{DC}+\bar{DE}+\bar{FE}\]
- \[\bar{BF}\]
- \[\bar{BE}\]
- \[\bar{BD}\]
- \[\bar{DB}\]

Q39 Find the sum of vectors \[\bar{AK}, \bar{KL}, \bar{LP}~~and ~~\bar{PQ}\]
- \[\bar{AQ}\]
- \[\bar{AP}\]
- \[\bar{AK}\]
- \[\bar{KP}\]

Q40 Find the standard equation for parabola whose directrix is the line x=2 and whose focus is the point (-2, 0)
- $$y^{2}= -8x$$
- $$y^{2}= -6x$$
- $$y^{2}= -5x$$
- $$y^{2}= -8x$$

Q41 Find the asymptotes of the hyperbola whose equation is given as \[\frac{x^{2}}{4}-\frac{y^{2}}{9}=1\]
- \[y=\pm\frac{4}{5}x\]
- \[y=\pm\frac{4}{9}x\]
- \[y=\pm\frac{4}{7}x\]
- \[y=\pm\frac{3}{7}x\]

Q42 Find equation of an ellipse whose major axis is vertical, with the center located (-1,3) at the distance between the center and one of the covertices equal to 4, and the distance between the center and one of the vertices equal to 6.
- \[\frac{(x-1)^{2}}{16}-\frac{(y-3)^{2}}{36}=1\]
- \[\frac{(x-1)^{2}}{16}+\frac{(y-3)^{2}}{36}=1\]
- \[\frac{(x+1)^{2}}{16}+\frac{(y+3)^{2}}{36}=1\]
- \[\frac{(x+1)^{2}}{16}+\frac{(y-3)^{2}}{36}=1\]

Q43 Find the equation of the parabola with focus (-1,4) and directrix y=3

- \[y=\frac{1}{2}x^{2}+x+4\]
- \[y=-\frac{1}{2}x^{2}+x+4\]
- \[y=\frac{1}{2}x^{2}-x+4\]
- \[y=\frac{1}{2}x^{2}+x-4\]

Q44 Given the equation \[9x^{2}-16y^{2}=14\], Find the coordinate of the foci
- \[F_{1}(5,0),F_{2}(-5,0)\]
- \[F_{1}(2,0),F_{2}(-2,0)\]
- \[F_{1}(3,0),F_{2}(-3,0)\]
- \[F_{1}(6,0),F_{2}(-5,0)\]

Q45 Given the equation \[9x^{2}-16y^{2}=14\], Find the interception at x
- 2
- 3
- -4
- 5

Q46 Given that ellipse has an equation of \[9x^{2}+4y^{2}=36\]
- \[\frac{x^{2}}{3^{2}}+\frac{y^{2}}{1^{2}}=1\]
- \[\frac{x^{2}}{2^{2}}+\frac{y^{2}}{3^{2}}=1\]
- \[\frac{x^{2}}{4^{2}}+\frac{y^{2}}{3^{2}}=1\]
- \[\frac{x^{2}}{3^{2}}+\frac{y^{2}}{2^{2}}=1\]

Q47 Find the equation of the parabola having vertex (0,0) axis along the x-axis and pass through (2,-1)
- \[y^{2}=\frac{x}{3}\]
- \[y^{2}=\frac{x}{2}\]
- \[y^{2}=\frac{x}{4}\]
- \[y^{2}=\frac{x}{5}\]

Q48 Find the focus in the equation \[y^{2}=5x\]
- \[F\left(4\frac{1}{4},0\right)\]
- \[F\left(3\frac{1}{4},0\right)\]
- \[F\left(2\frac{1}{4},0\right)\]
- \[F\left(1\frac{1}{4},0\right)\]

Q49 Find the focus of the parabola whose equation is \[y^{2}+32x\]
- F(-5,0)
- F(-8,0)
- F(-7,0)
- F(-6,0)

Q50 Find the directrix of the parabola whose equation is \[x^{2}-30y\]
- \[-7\frac{1}{2}\]
- \[-8\frac{1}{2}\]
- \[6\frac{1}{2}\]
- \[-5\frac{1}{2}\]

Q51 Find the equation of the circle with its center at the origin with points(-3,4) on the circle
- \[x^{2}+y^{2}=25\]
- \[x^{2}-y^{2}=25\]
- \[x^{2}+y^{2}=15\]
- \[x^{2}-y^{2}=15\]

Q52 Find the radius of a circle given by \[x=4+2\cos\theta, y=-3+2\sin\theta\]
- 5
- 2
- 4
- 6

Q53 Find the vector product \[a\times b\]. If a = i + 2j - k and b = 2i + 3j + k
- 5i - 3j - k
- 2i - 4j - k
- 3i + j - k
- I - j + 3k

Q54 Find the center of a center of a circle given by $x=4+2\cos\theta, y=-3+2\sin\theta$

- (5,3)
- (2,1)
- (4,-3)
- (3,6)

Q55 Find the parametric equations of a circle with centre (2,-1) and radius 3

- $x=2+3\cos\theta, y=-1+3\sin\theta$
- $x=1+2\cos\theta, y=-2+3\sin\theta$
- $x=2+5\cos\theta, y=3\sin\theta$
- $x=-2+5\cos\theta, y=-3+2\sin\theta$

Q56 Find the point of the intersection of the center $x^{2}+y^{2}-3y=0$ with line y=x-1

- (1,0) and (2,3)
- (1,0) and (2,1)
- (0,1) and (1,1)
- (2,3) and (2,2)

Q57 Given the equation of a circle is $x^{2}+y^{2}+2x-6y-15$. Find the radius of the circle

- 5
- 3
- 4
- 1

Q58 Given the equation of a circle is $x^{2}+y^{2}+2x-6y-15$. Find the center of the circle

- (-1,2)
- (2,5)
- (2,5)
- (-1,3)

Q59 Find the center of the circle $x^{2}+y^{2}+8x + 6y = 0$.

- (-3,-4)
- (-4,-3)
- (3,4)
- (4,3)

Q60 Find the radius of the circle $x^{2}+y^{2}+8x + 6y = 0$.

- 6
- 3
- 4
- 5

Q61 Find the equation to the straight line passing through the point of intersection of the lines 5x+6y +1 = 0 and 3x + 2y +5 =0 and perpendicular to the line 3x-5y+11 = 0

- 2x + 3y+4 = 0
- 5x + 3y+8 = 0
- 2x+4y+5 = 0
- 3x+ 2y+7 = 0

Q62 A dot product is said to be distributive,if ?â?¦?â?¦..

- m.u=u.m
- m(u.v)=v(m.v)
- u.(v+w)=(u.v+u.w)
- m=u

Q63 If the slope of a line passing through the point A(3, 2) is $\frac{3}{4}$. then find points on the line which are 5 units away from the point A.

- (â?? ??1, â?? ??1)
- (3,2)
- (â?? ??1, 2)
- (3,4)

Q64 Find the equation of the line through the point (??1, 2) which is perpendicular to y = 2x - 1

- $\frac{-1}{2}x+\frac{3}{2}$
- $\frac{1}{2}x-\frac{3}{4}$

- \[\frac{3}{7}x+\frac{1}{2}\]
- \[\frac{3}{2}x+\frac{1}{2}\]

Q65 Find the equation of the line through the point (â?�??1, 2) which is parallel to y = 2x + 1
- y = 2x+ 5
- y = 3x+ 6
- y = -x + 1
- y = 3x + 5

Q66 Find the angle between the two lines 3x+4y = 8 and 2x 8y = 14 0
- \[15.63^{0}\]
- \[14.63^{0}\]
- \[60.1^{0}\]
- \[24^{0}\]

Q67 A straight line has a gradient of \[\frac{5}{3}\] and it passes through the point (1,3). Find its equation
- \[\frac{5}{3}x-\frac{8}{3}\]
- \[\frac{5}{3}x+\frac{8}{3}\]
- \[\frac{1}{3}x-\frac{2}{3}\]
- \[\frac{2}{3}x+\frac{2}{5}\]

Q68 If A is (3,6) and B is (4,8). Find the coordinate of the midpoint of AB
- \[\left(3\frac{1}{2},7\right)\]
- \[\left(-2\frac{3}{4},5\right)\]
- \[\left(3\frac{3}{5},6\right)\]
- \[\left(3\frac{3}{4},7\right)\]

Q69 The gradient of the line A(4,3) and B(8,6)
- \[\frac{3}{4}\]
- \[\frac{3}{5}\]
- \[\frac{1}{6}\]
- \[\frac{2}{5}\]

Q70 Find the distance between the point A(5,4) and B(7,6)
- \[\sqrt(2)\]
- \[2\sqrt(2)\]
- \[2\sqrt(3)\]
- \[\sqrt(3)\]

Q71 A vector having direction opposite to that of vector A,buth with the same magnitude is denoted by ———
- -B
- A
- -A
- B

Q72 If a=2i+4j+3k and b=i+5j-2k. Find the vector product of a and b
- -3i+5j-k
- -3i+75j+3k
- -23i+7j+6k
- -23i-7j+2k

Q73 If a=5i+4j+2k, b=4i-5j+3k and c=2i-j-2k. Determine value \[a\dot b\]
- 10i-4j-4k
- 10i+4j+4k
- 8i-2j-4k
- 10i+4j+4k

Q74 If a= 2i+2j-k and b=3i-6j+2k. Find the scalar product a and b
- 7i-2j-3k
- 8i-22j-5k
- 6i-12j-2k
- 6i-3j+k

Q75 Find the direction cosine [l,m,n] of the r=2i+4j-3k
- \[\frac{2}{\sqrt(29)},\frac{4}{\sqrt(29)},\frac{-3}{\sqrt(29)}\]

- \[\frac{2}{\sqrt(27)},\frac{4}{\sqrt(27)},\frac{-3}{\sqrt(27)}\]
- \[\frac{-1}{\sqrt(29)},\frac{5}{\sqrt(29)},\frac{4}{\sqrt(29)}\]
- \[\frac{2}{\sqrt(27)},\frac{4}{\sqrt(27)},\frac{-3}{\sqrt(27)}\]

Q76 If \[Z_{1}=2i-4j\],\[Z_{2}=2i+6j\] and \[Z_{3}=3i-j\] find the \[Z_{1}-Z_{2}-Z_{3}\]
- -6i-9j
- 3i-4j
- -3i-9j
- 2i-5j

Q77 If \[Z_{1}=3i+5j\] and \[Z_{2}=7i+3j\], find the \[Z_{1}-Z_{2}\]
- -4i+2j
- i+3j
- -2+3j
- -5i+j

Q78 Find the sum \[\overline{BC}-\overline{DC}+\overline{DE }+\overline{DE}+\overline{EF}\]
- \[\overline{EF}\]
- \[\overline{BF}\]
- \[\overline{AF}\]
- \[\overline{AD}\]

Q79 Find the sum \[\overline{AB}+\overline{BC}+\overline{CD}+\overline{DE}+\overline{EF}\]
- \[\overline{AD}\]
- \[\overline{AE}\]
- \[\overline{FB}\]
- \[\overline{AF}\]

Q80 If a = a force of 30N, acting in the east direction. b =a force of 40N, acting in the north direction. find the magnitude of the vector sum r of these forces
- 60N
- 50N
- 70N
- 30N