Analytical Geometry and Linear Algebra I, Class #6

Innopolis University, October 2021

1 Lines in plane

1. Find the slope of the line joining the points $(2, 3)$ and $(4, -5)$.
2. Find the slope of the line $2x - 3y + 7 = 0$.
3. Find the equation of the straight line, the portion of which between the axes is bisected at the point $(2, -5)$.
4. Find the equation of the straight line passing through the intersection of the lines $3x - y = 5$ and $2x + 3y = 7$ and making an angle of $45°$ with the positive direction of x-axis.
5. Find the equation of the straight line concurrent[1] with the lines $2x + 3y = 3$ and $x + 2y = 2$ and also concurrent with the lines $3x - y = 1$ and $x + 5y = 11$.
6. $A(4, 1)$, $B(7, 4)$, and $C(5, -2)$ are the vertices of a triangle. Find the line equation which is goes from A and perpendicular to BC.

[1] Lines are said to be cuncurrent if they are intersect at a single point

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1. Find the equation of the straight line making an angle 135° with the positive direction of x-axis and cutting of an intercept 5 on the y-axis.
2. Find the equation of the straight line cutting off the intercepts 2 and -5 on the axes.
3. Find the equation of the straight line passing through the points $(7, 3)$ and cutting off equal intercepts on the axes.
4. Find the equation of the straight line of the portion of which between the axes is divided by the point $(4, 3)$ in the ratio 2:3.
5. Find the equations to the straight lines each of which passes through the point $(3, 2)$ and intersect the x and y axes at A and B such that $OA - OB = 2$.
6. Prove that the triangle whose vertices are $(2, 5)$, $(3, 4)$, and $(7, 10)$ is a right angled isosceles triangle. Find the equation of the hypotenuse.
7. Find the equation of the straight line passing through the intersection of the lines $7x + 3y = 7$ and $2x + y = 2$ and cutting off equal intercepts on the axes.
8. Find the equation of the perpendicular bisector of the line joining the points $(2, 6)$ and $(4, 6)$.
9. Find the equation of the line through the intersection of $2x + y = 8$ and $3x + 7 = 2y$ and parallel to $4x + y = 11$.