Question 3:

Find the equation of a straight line on which length of perpendicular from the origin is four units and the line makes an angle of 120° with the positive direction of x-axis

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Sol: Given that the line makes and angle 120° with positive direction of x-axis.

$\therefore$ Slope of the line is $\tan 120° = -\sqrt{3}$

So, equation of the required line is: $y = -\sqrt{3}x + c \Rightarrow \sqrt{3}x + y - c = 0.$

Now distance of this line from (0, 0) is 4 units.

$$\therefore \quad \frac{|\sqrt{3}(0) + 0 - c|}{\sqrt{3+1}} = 4$$

$$\Rightarrow \quad |c| = 8 \quad \Rightarrow \quad c = \pm 8$$

Thus, equation of the required lines is $\sqrt{3}x + y \pm 8 = 0.$