Practice Questions

Q5. True/False: The line $x + 3y = 0$ is a diameter of the circle $x^2 + y^2 + 6x + 2y = 0$.

S5. For given line to be a diameter of the circle, it has to have intersection on two points and those points should have distance equal to $2r$. Recall from notes that to have two intersection point, quadratic equation in one variable has to have two real roots. Put $x = -3y$ in circle equation,

$$9y^2 + y^2 - 18y + 2y = 0$$
$$10y^2 - 16y = 0$$
$$y(y - \frac{8}{5}) = 0$$

Put values of y in $x = -3y$, and we get two intersection points as: $(0,0)$ and $(\frac{-24}{5}, \frac{8}{5})$. And distance between them,

$$2r = \sqrt{\frac{(24)^2 + (8)^2}{5^2}} = \sqrt{25.6} = 5.05$$

And from genreal form of circle we get $2r = 2\sqrt{g^2 + f^2 - c} = 2\sqrt{10}2x3.16 = 6.32$. It is clear that intersection points of line with circle makes a secant rather than a diameter. So it a FALSE statement.