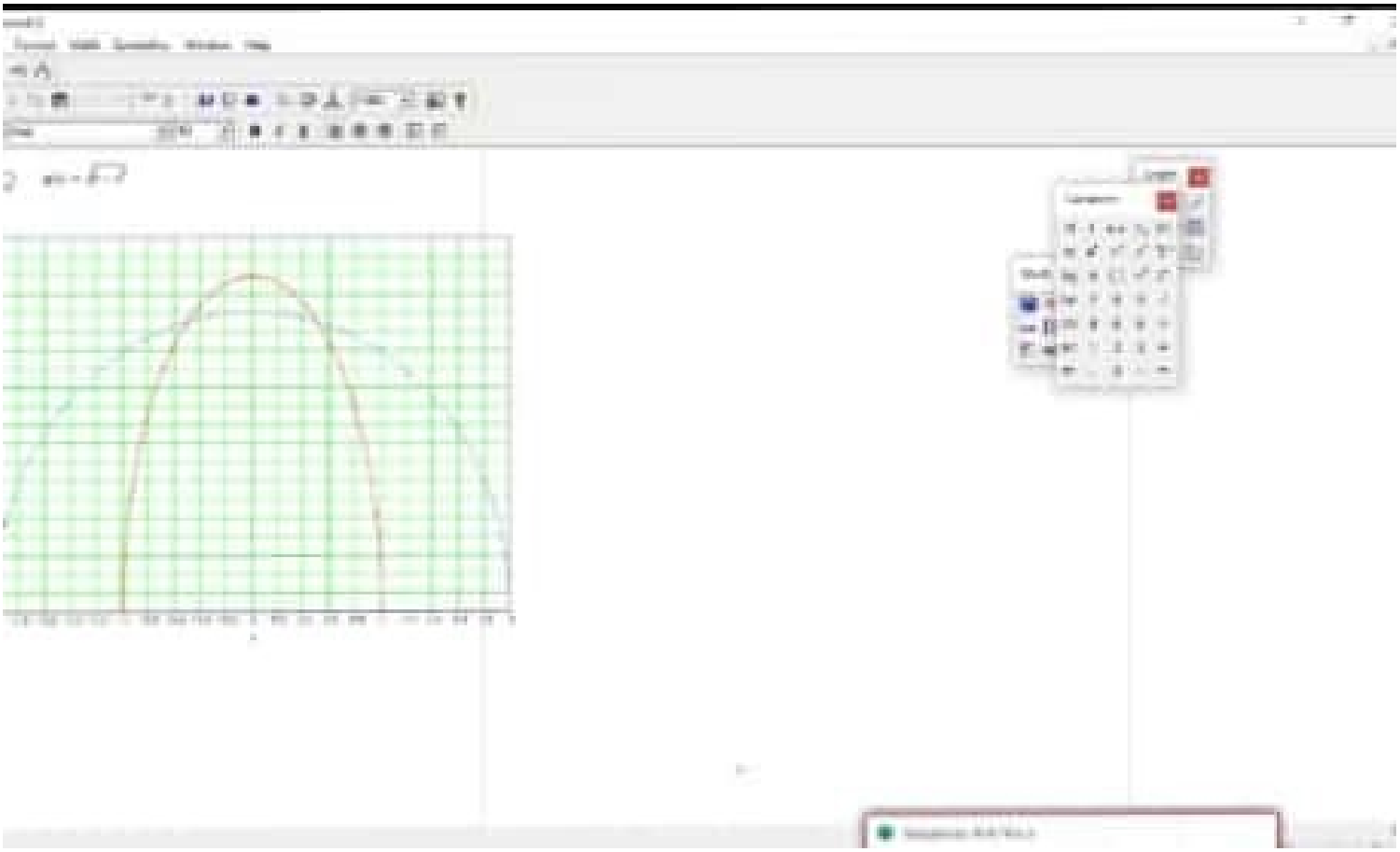

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Ugbowanko Ogheneochuko
18/Eng06/1067
Mechanical Engineering
Eng 281

$5x^2+y^2=5$ - (i)

$x^2+y^2=4$ - (ii)

By substitution

$5x^2+y^2=5$

$x^2+y^2=4$

$4x^2=1$

$\frac{4x^2}{4}=\frac{1}{4}$

$x^2=1/4$

$x=\sqrt{1/4}=1/2$

Substituting x into eqn (i)

$5(1/2)+y^2=5$

$\frac{5}{4}+y^2=5$

$y^2=5-5/4$

$y^2=15/4$

$y=\sqrt{15}/4$

$y=1.93$

Differentiating

$x^2+y^2=4$

it becomes,

$2y\,dy/dx=-2x$

$\frac{dy}{dx}=\frac{-2x}{2y}$

$\frac{dy}{dx}=-\frac{x}{y}$

$\frac{dy}{dx}=\frac{(1/2)}{1.93}$

$dy/dx=-0.2590$

for Mathcad

$5x^2+y^2=5$

$y^2=5-5x^2$

Therefore $f(x)=y$

$f(x)=\sqrt{5-5x^2}$

$x^2+y^2=4$

$y^2=4-x^2$

$y=\sqrt{4-x^2}$

$g(x)=y$

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