SEC Assignment

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Sem 6
Section A
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Solution 1

Code :

```
\begin{align*}
 z  & = y^4 + 4 \\
  & = (y^2 + 2)^2 -4y^2 \\
 &  \leq (y^2 +2)^2.
\end{align*}
```

$$\begin{aligned} z &= y^4 + 4 \\ &= (y^2 + 2)^2 - 4y^2 \\ &\leq (y^2 + 2)^2. \end{aligned}$$

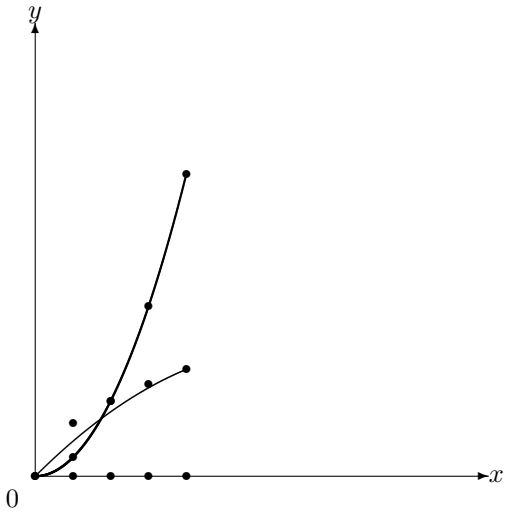
Solution 2

$$f(x) = \begin{cases} x^2, & \text{for } 0 \leq x \leq 2, \\ \sqrt{x}, & \text{for } 0 \leq x \leq 2. \end{cases}$$

Code :

```
\begin{center}
\setlength{\unitlength}{1cm}
\begin{picture}(6,6)

% Axes
\put(0,0){\vector(1,0){6}} % x-axis
\put(0,0){\vector(0,1){6}} % y-axis

% Labels
\put(6,0){\makebox(0,0)[l]{$x$}}
```

```
\put(0,6){\makebox(0,0)[b]{$y$}}
\put(-0.3,-0.3){\makebox(0,0){$0$}}

% Plot points for y = x^2
\multiput(0,0)(0.5,0){5}{\circle*{0.1}} % x = 0, 0.5, 1, 1.5, 2
\put(0.5,0.25){\circle*{0.1}}  % (0.5, 0.25)
\put(1,1){\circle*{0.1}}       % (1,1)
\put(1.5,2.25){\circle*{0.1}}  % (1.5,2.25)
\put(2,4){\circle*{0.1}}       % (2,4)


\linethickness{0.75pt}
\qbezier(0,0)(1,0)(2,4)


\put(0,0){\circle*{0.1}}
\put(0.5,0.707){\circle*{0.1}}
\put(1,1){\circle*{0.1}}
\put(1.5,1.224){\circle*{0.1}}
\put(2,1.414){\circle*{0.1}}


\linethickness{0.5pt}
\qbezier(0,0)(1,1)(2,1.414)

\end{picture}
\end{center}
```



Solution 3

Code :

```
\[ \begin{pmatrix} \hspace{0.1in}
\begin{vmatrix}
a_{11} & b_{12} \\
c_{21} & d_{22}
\end{vmatrix} & = & x^2 + y^2 + z^2 \hspace{0.2in}
\end{pmatrix}.
\]
```

$$\left(\begin{vmatrix} a_{11} & b_{12} \\ c_{21} & d_{22} \end{vmatrix} \quad = \quad x^2 + y^2 + z^2 \right).$$