

1 Center text

```

\centerline{Derive circle parametric equation}

```

Derive circle parametric equation	
multiple line search/matrix block	/\begin{matrix}+\backslash\backslash{-}\backslash\end{matrix}
multiple line search	/\begin{matrix}+\backslash\backslash{-}\backslash\end{matrix}

2 Greek Symbols

alpha	$\alpha$	theta	$\theta$	tau	$\tau$	beta	$\beta$
varthetaeta	$\vartheta$	pi	$\pi$	upsilon	$\upsilon$	gamma	$\gamma$
varpi	$\varpi$	phi	$\phi$	delta	$\delta$	kappa	$\kappa$
rho	$\rho$	varphi	$\varphi$	epsilon	$\epsilon$	lambda	$\lambda$
varrho	$\varrho$	chi	$\chi$	varpiellon	$\varepsilon$	mu	$\mu$
sigma	$\sigma$	psi	$\psi$	zeta	$\zeta$	nu	$\nu$
varsigma	$\varsigma$	omega	$\omega$	eta	$\eta$	xi	$\xi$
Gamma	$\Gamma$	Lambda	$\Lambda$	Sigma	$\Sigma$	Psi	$\Psi$
Delta	$\Delta$	Upsilon	$\Upsilon$	Omega	$\Omega$	Theta	$\Theta$
Pi	$\Pi$	Phi	$\Phi$	Upsilon	$\Upsilon$	Theta	$\Theta$

<code>\dot</code>	$\dot{\phantom{x}}$
<code>\cdots</code>	$\cdots$
<code>\ddots</code>	$\ddots$
<code>\reflectbox{\$\ddots\$}</code>	$\ddots^{\hspace{-1.5pt}}\hspace{-1.5pt}$
<code>\vdots</code>	$\vdots$
<code>\vdots</code>	$\vdots$
<code>\frac{dy}{dx}</code>	$\frac{dy}{dx}$
<code>\dfrac{dy}{dx}</code>	$\frac{dy}{dx}$
<code>\frac{dy}{dx}</code>	$\frac{dy}{dx} = \frac{y^2}{x^2}$
<code>\dfrac{dy}{dx}</code>	$\frac{dy}{dx} = \frac{d^2y}{dx^2}$
<code>\vert \vec{u} \vert</code>	$ \vec{u} $
<code>\abs{\vec{u}}</code>	$ \vec{u} $
<code>\norm{\vec{u}}</code>	$\ \vec{u}\ $
<code>  \vec{r}  </code>	$ \vec{r} $
<code>\mathcal{V}</code> \quad <code>\mathcal{W}</code>	$\mathcal{V} \quad \mathcal{W}$

```

\frac{\partial u}{\partial x} = h^2
\left( \frac{\partial^2 u}{\partial x^2} +
\frac{\partial^2 u}{\partial y^2} +
\frac{\partial^2 u}{\partial z^2}
\right)

```

$$\frac{\partial u}{\partial x} = h^2 \left( \frac{\partial^2 u}{\partial x^2} + \frac{\partial^2 u}{\partial y^2} + \frac{\partial^2 u}{\partial z^2} \right)$$

3 Table

3.1 Tabular

10	20	30	40	50
0.8	28	38	48	58
28	38	48	58	68
0.7	108	118	128	99
98	108	118	128	88

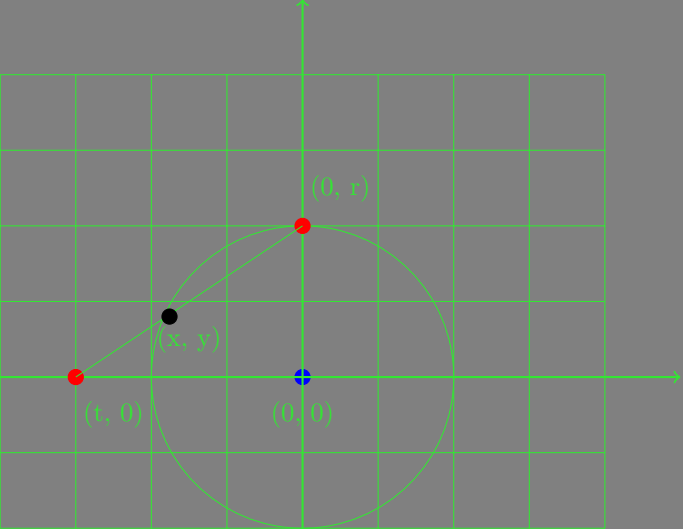
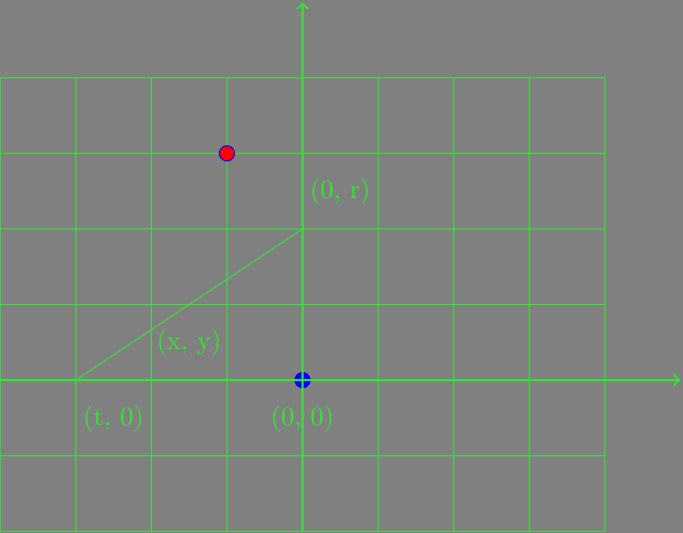
```

\begin{tabular}{|c|c|c|c|c|}
\hline
10 & 20 & 30 & 40 & 50 \\ \hline
0.8 & 28 & 38 & 48 & 58 \\ \hline
28 & 38 & 48 & 58 & 68 \\ \hline
0.7 & 108 & 118 & 128 & 99 \\ \hline
98 & 108 & 118 & 128 & 88 \\ \hline
\end{tabular}

```

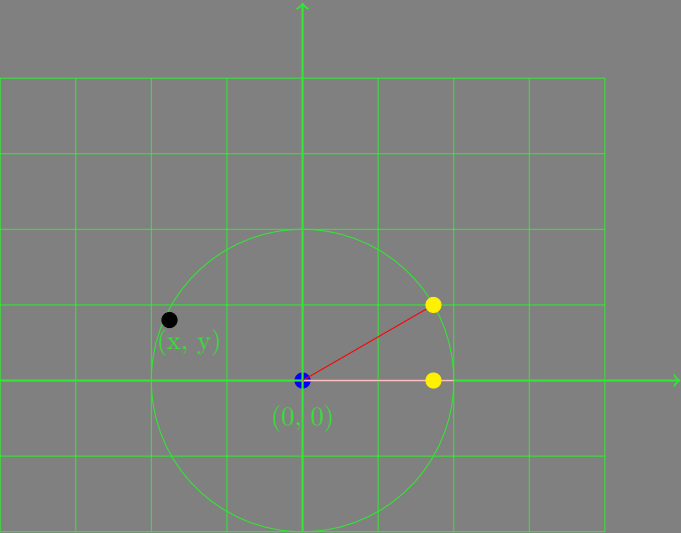






```
\begin{tikzpicture}[yscale=-1]
  % 4x4 grid
  \draw (-2, 0) grid (6, 6);
  % origin point
  \draw [color=blue, fill=blue] (2, 4) circle (0.1);
  % x-axis
  \draw [thick,->] (-2, 4) -- (7, 4);
  % y-axis
  \draw [thick,->] (2, 6) -- (2, -1);
  % origin label
  \node at (2, 4.5) {(0, 0)};
  \draw (2, 4) circle (2);
  \draw [color=red, fill=red] (2, 2) circle(0.1);
  \node at (2.5, 1.5){(0, r)};
  \draw [color=red, fill=red] (-1, 4) circle(0.1);
  \node at (-0.5, 4.5){(t, 0)};
  \draw (2, 2)--(-1, 4);
  \node at (0.5, 3.5){(x, y)};
  \draw [color=black, fill=black] (0.24, 3.2) circle(0.1);
\end{tikzpicture}\n \n
```

Rotate a line around a point in degree













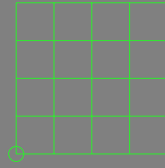


```

\begin{tikzpicture}
  \draw[red] (0, 0) circle[radius=1cm];
  \foreach \i in {0, 60, 120, 180, 240, 300} {
    \draw (0, 0) -- (\i: 1);
    \fill (\i: 1) circle[radius=0.1cm];
  }
\end{tikzpicture}

```

## 14 Draw Grid

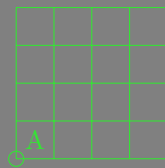


```

\tikz{
  \draw (0, 0) grid[step=0.5] (2, 2);
  \draw (0, 0) circle [radius=0.1];
}

```

## 15 Draw Grid with text

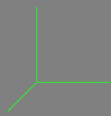


```

\tikz{
  \draw (0, 0) grid[step=0.5] (2, 2);
  \node (text) at (0.25, 0.25) {A}
  \draw (0, 0) circle [radius=0.1];
}

```

## 16 Cartesian Coordinates System



```

\begin{tikzpicture}[>->]
  \draw (0,0,0) -- (1,0,0);
  \draw (0,0,0) -- (0,1,0);
  \draw (0,0,0) -- (0,0,1);
\end{tikzpicture}

```

## 17 Draw Triangle, label end point



```

\begin{tikzpicture}
  \draw (0,0) -- (1,1);
  \draw (0,0) -- (1,0);
  \draw (1,1) -- (1,0);
  \draw [left=1pt](0,0) node {A};

```

```

\draw [above=1pt](1,1) node {B};
\draw [below=1pt](1,0) node {C};
\end{tikzpicture}

```

## 18 Binary Tree With Color, side by side

```

\tikzset{
  stdNode/.style={rounded corners, draw, align=right},
  greenRed/.style={stdNode, top color=green, bottom color=red},
  blueRed/.style={stdNode, top color=blue, bottom color=red}
}
\begin{tikzpicture}[level distance=1.5cm,
level 1/.style={sibling distance=3cm},
level 2/.style={sibling distance=1.5cm}]
\node at(0, 0) {8}
child {node [greenRed]{2}
  child {
    node [greenRed]{5}
    child {node [greenRed]{115}}
    child {node {119}}
  }
  child {
    node [greenRed]{9}
    child {node [greenRed]{13}
      child {node {15}}
      child {
        node [greenRed]{10}
        child {node [greenRed]{19}}
      }
    }
  }
}
}
};
\node at(3, 0) [greenRed]{8}
child {node [greenRed]{2}
  child {
    node [greenRed]{5}
    child {node [greenRed]{115}}
  }
}
};
\end{tikzpicture}

```

