

Programy użytkowe semestr zimowy 2024/2025

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Ćwiczenie 5

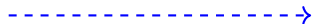
figure

```
\begin{figure}[h]  
\includegraphics...  
\caption{...}  
\label{...}  
\end{figure}
```

h	here (tutaj, ale nie dokładnie!)
t	top (na górze)
b	bottom (na dole)
H	here (dokładnie tutaj, potrzebuje pakietu float)
p	na oddzielnej stronie dla obrazów

Pakiet tikz

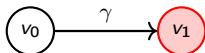
```
\begin{tikzpicture}  
\draw [blue, thick, ->, dashed] (-2,0) -- (2,0);  
\end{tikzpicture}
```



Pakiet tikz

```
\begin{figure}[H]
\begin{tikzpicture}[auto, node distance=2cm,
                    thick,main node/.style=
                    {circle,draw,font=\small\bfseries}]

\node[main node] (0) {$v_0$};
\node[main node, draw=red, fill=red!20] (1) [right of=0] {$v_1$};
\path[every node/.style={font=\small}]
(0) edge node [bend right] {$\gamma$} (1);
\draw[->] (0) to (1);
\end{tikzpicture}
\end{figure}
```



Pakiet tikz

```
\begin{tikzpicture}[auto,node distance=2cm,
                    thick,main node/.style={circle, draw,
fill=black!100,
                    inner sep=0pt, minimum width=3pt}]

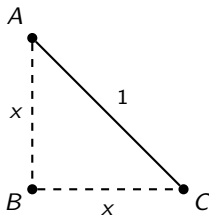
\node[main node] (1) [label={[above left]$A$}] {};
\node[main node] (2) [below of=1,label={[below left]$B$}] {};
\node[main node] (3) [right of=2,label={[below right]$C$}] {};

\path[every node/.style={font=\sffamily\small}]
    (1) edge node {$1$} (3);

\path[every node/.style={font=\sffamily\small}, dashed]
    (2) edge node {} (3);
```

Pakiet tikz

```
\draw[dashed] (1) to (2);  
\node[draw=none, node distance=1.3cm] (4)  
[below of=1, label={[above left]$$x$$}]{};  
\node[draw=none, node distance=1cm] (4)  
[right of=2, label={[below=0.2 cm]$$x$$}]{};  
\end{tikzpicture}
```



Rysunek: Trójkąt

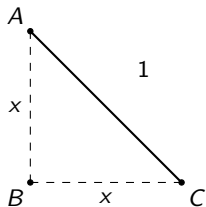
Trójkąt we współrzędnych

```
\begin{tikzpicture}

\draw[dashed] (0,0) -- (0,2);
\draw[dashed] (0,0) -- (2,0);
\draw[thick] (0,2) -- (2,0);
\node[draw, circle, fill=black!100, inner sep=0pt,minimum size=2pt]
  at (0, 0){};
\node[draw, circle, fill=black!100, inner sep=0pt,minimum size=2pt]
  at (2, 0){};
\node[draw, circle, fill=black!100, inner sep=0pt,minimum size=2pt]
  at (0, 2){};
\node[draw=none] at (-0.2, 2.2){$A$};
\node[draw=none] at (-0.2, -0.2){$B$};
\node[draw=none] at (2.2, -0.2){$C$};
\node[draw=none] at (-0.2, 1.0){$x$};
\node[draw=none] at (1.0, -0.2){$x$};
\node[draw=none] at (1.5, 1.5){$1$};

\end{tikzpicture}
```

Trójkąt we współrzędnych



Rysunek: Trójkąt we współrzędnych

Wykres funkcje

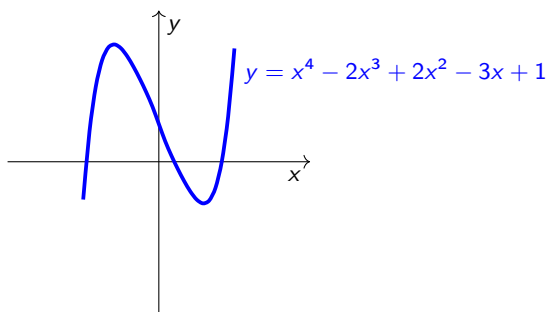
```
\begin{tikzpicture}[scale=0.5]

\draw [->] (-4,0) -- (4,0) node [below left]  {$x$};
\draw [->] (0,-4) -- (0,4) node [below right] {$y$};

\draw[scale=1, domain=-2:2, smooth, variable=\x,
line width = 0.5mm, color=blue] plot (\x, \x^4-2*\x^3+2*\x^2-3*\x+1)
node [below right] {$y=x^4-2x^3+2x^2-3x+1$};

\end{tikzpicture}
```

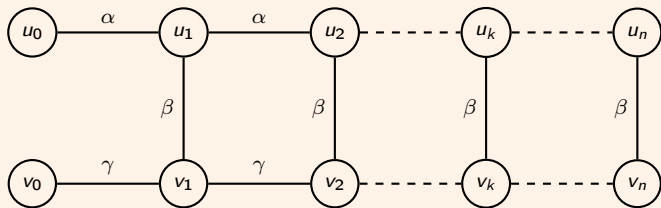
Wykres funkcje



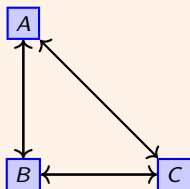
Rysunek: Osi współodrzędne oraz $y = x^4 - 2x^3 + 2x^2 - 3x + 1$

Pakiet tikz

Zadanie 1



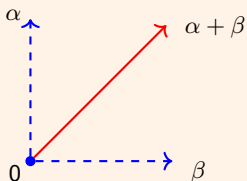
Zadanie 2



Rysunek: Strzałki

Zadanie 3

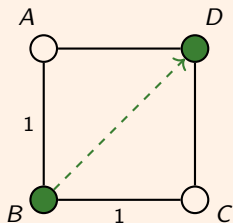
Narysuj to na dwa sposoby: zaczynając od wierzchołka 0 oraz używając współrzędne.



Pakiet tikz

Zadanie 4

Narysuj to na dwa sposoby: zaczynając od jednego z wierzchołków 0 oraz używając współrzędne.

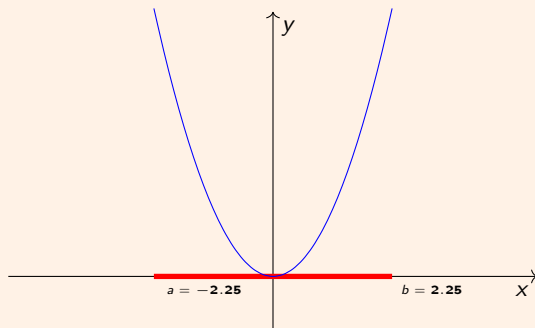


Użyj koloru OliveGreen z

```
\usepackage[dvipsnames]{xcolor}
```

Zadanie 5

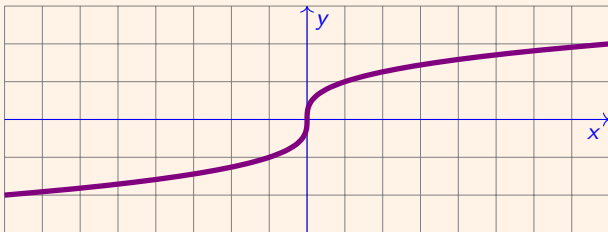
Narysuj wykres:



Rysunek: $y = x^2$ na $(-2.25, 2.25)$

Zadanie 6

Znajdź, jak dodać siatkę i narysuj wykres:



Rysunek: $y = \sqrt[3]{x}$ na $(-8, 8)$

Zadanie 7*

