**Edge-transitive graphs**

“WeRegular graphs”

We consider simple connected regular edge-transitive graphs with \( n \leq 15 \) vertices.

\[ n = 7. \]

\( n = 2. \)

- Complete graph \( K_2 \)

\( n = 3. \)

- Cycle \( C_3 \) (Complete graph \( K_3 \), Triangle)

\( n = 4. \)

- Cycle \( C_4 \) (Quadrilateral)
- Complete graph \( K_4 \) (Tetrahedron)

\( n = 5. \)

- Cycle \( C_5 \) (Pentagon)
- Complete graph \( K_5 \)

\( n = 6. \)

- Cycle \( C_6 \) (Hexagon)
- Complete bipartite graph \( K_{3,3} \)
- Cocktail party graph \( CP(3) \) (Octahedron)
- Complete graph \( K_6 \)

\( n = 8. \)

- Complete graph \( K_7 \)

\( n = 8. \)

- Complete bipartite graph \( K_{4,4} \)
- Cocktail party graph \( CP(4) \)

\( n = 9. \)

- Complete graph \( K_8 \)
- Complete tripartite graph \( K_{3,3,3} \)
### A. 2 Edge-transitive graphs

#### $n = 10$.  

- Cycle $C_{10}$ (Decagon)  
- Petersen graph  
- Circulant graph $C_{i_{10}}(1, 3)$  
- Circulant graph $C_{i_{10}}(1, 4)$  
- Complete bipartite graph $K_{5, 5}$  
- Triangular graph $T(5)$  
- Cocktail party graph $CP(5)$  
- Complete graph $K_{10}$  

#### $n = 12$.  

- Cycle $C_{12}$  
- Circulant graph $C_{i_{12}}(1, 5)$  
- Bipartite graph with 6,6-points  
- Icosahedron  
- Bipartite graph with 6,6-points  
- Circulant graph $C_{i_{12}}(1, 2, 5)$  
- Complete bipartite graph $K_{6, 6}$  
- Complete tripartite graph $K_{4, 4, 4}$  
- Complete 4-partite graph $K_{3, 3, 3, 3}$  

#### $n = 11$.  

- Cycle $C_{11}$  
- Complete graph $K_{11}$
Edge-transitive graphs

$n = 14$.

- Cocktail party graph $CP(7)$
- Complete graph $K_{14}$

$n = 13$.

- Cocktail party graph $CP(6)$
- Complete graph $K_{12}$

- Cycle $C_{13}$
- Circulant graph $C_{i_{13}}(1, 6)$
- Circulant graph $C_{i_{13}}(1, 3, 5)$
- Circulant graph $C_{i_{13}}(1, 3, 5, 7)$

- Bipartite graph with 7, 7-points
- Circulant graph $C_{i_{14}}(1, 6)$
- Circulant graph $C_{i_{14}}(1, 3, 5)$

- Complete graph $K_{13}$
- Complete graph $K_{14}$
$n = 15$. 

- Cycle $C_{15}$
- Circulant graph $Ci_{15}(1, 4)$
- Circulant graph $Ci_{15}(1, 2, 4, 5, 7)$
- Circulant graph $Ci_{15}(1, 2, 3, 4, 6, 7)$
- Complete graph $K_{15}$
- Circulant graph $Ci_{15}(1, 4, 6)$
- Complement graph $T(6)$
- Circulant graph $Ci_{15}(1, 2, 4, 7)$
- Triangular graph $T(6)$
“Bipartite graphs”

We consider simple connected edge-transitive graphs with \( n \leq 15 \) vertices of not regular, that is, bipartite.

\( \text{n = 3.} \)

\[
\begin{align*}
\text{Complete bipartite graph } K_{1,2} \\
\text{Complete bipartite graph } K_{1,3}
\end{align*}
\]

\( \text{n = 4.} \)

\[
\begin{align*}
\text{Complete bipartite graph } K_{1,3} \\
\text{Complete bipartite graph } K_{2,3}
\end{align*}
\]

\( \text{n = 5.} \)

\[
\begin{align*}
\text{Complete bipartite graph } K_{1,4} \\
\text{Complete bipartite graph } K_{2,3} \\
\text{Complete bipartite graph } K_{2,4}
\end{align*}
\]

\( \text{n = 6.} \)

\[
\begin{align*}
\text{Complete bipartite graph } K_{1,5} \\
\text{Complete bipartite graph } K_{2,4} \\
\text{Complete bipartite graph } K_{2,5}
\end{align*}
\]

\( \text{n = 7.} \)

\[
\begin{align*}
\text{Complete bipartite graph } K_{1,6} \\
\text{Complete bipartite graph } K_{2,5} \\
\text{Complete bipartite graph } K_{3,4}
\end{align*}
\]

\( \text{n = 8.} \)

\[
\begin{align*}
\text{Complete bipartite graph } K_{1,7} \\
\text{Complete bipartite graph } K_{2,6} \\
\text{Complete bipartite graph } K_{3,5}
\end{align*}
\]

\( \text{n = 9.} \)

\[
\begin{align*}
\text{Complete bipartite graph } K_{1,8} \\
\text{Complete bipartite graph } K_{2,7} \\
\text{Complete bipartite graph } K_{3,6} \\
\text{Bipartite graph with 3,6-points} \\
\text{Complete bipartite graph } K_{4,5}
\end{align*}
\]
A. 6  

**Edge-transitive graphs**

\[ n = 10. \]

- Complete bipartite graph \( K_{1,9} \)
- Complete bipartite graph \( K_{2,8} \)
- Complete bipartite graph \( K_{3,7} \)
- Complete bipartite graph \( K_{4,6} \)
- Bipartite graph with 4,6-points

\[ n = 11. \]

- Complete bipartite graph \( K_{1,10} \)
- Complete bipartite graph \( K_{2,9} \)
- Complete bipartite graph \( K_{3,8} \)
- Complete bipartite graph \( K_{4,7} \)
- Complete bipartite graph \( K_{5,6} \)
- Complete bipartite graph \( K_{1,11} \)
- Complete bipartite graph \( K_{2,10} \)
- Complete bipartite graph \( K_{3,9} \)
- Complete bipartite graph \( K_{4,8} \)
- Complete bipartite graph \( K_{5,7} \)
- Bipartite graph with 3,9-points
- Bipartite graph with 4,8-points
- Bipartite graph with 4,8-points
$n = 13.$

- Complete bipartite graph $K_{1,12}$
- Complete bipartite graph $K_{2,11}$
- Complete bipartite graph $K_{3,10}$
- Complete bipartite graph $K_{4,9}$
- Complete bipartite graph $K_{5,8}$
- Complete bipartite graph $K_{6,7}$

$n = 14.$

- Complete bipartite graph $K_{1,13}$
- Complete bipartite graph $K_{2,12}$
- Complete bipartite graph $K_{3,11}$
- Complete bipartite graph $K_{4,10}$
- Complete bipartite graph $K_{5,9}$
- Complete bipartite graph $K_{6,8}$

Bipartite graph with 6,8-points

Bipartite graph with 6,8-points
A. 8

Edge-transitive graphs

\( n = 15 \).

- Complete bipartite graph \( K_{1,14} \)
- Complete bipartite graph \( K_{2,13} \)
- Complete bipartite graph \( K_{3,12} \)
- Complete bipartite graph \( K_{4,11} \)
- Complete bipartite graph \( K_{5,10} \)
- Complete bipartite graph \( K_{6,9} \)
- Complete bipartite graph \( K_{7,8} \)
Incomplete bipartite graphs

We consider incomplete bipartite graphs which are simple, connected, and edge-transitive graphs with $n \leq 15$ vertices.

- $(3, 3)$ Cycle $C_6$
- $(4, 4)$ Cycle $C_8$
- $(3, 6)$ Hamming graph $H(3, 2)$
- $(3, 9)$
- $(4, 6)$
- $(5, 5)$ Cycle $C_{10}$
- $(4, 8)$
- $(6, 6)$
- $(6, 8)$ Cycle $C_{12}$
- $(6, 8)$ Circulant graph $Ci_{10}(1, 3)$
A. 10

Edge-transitive graphs

(7, 7) Cycle $C_{14}$

(6, 9)

(3, 12)

(5, 10)
Distance regular graphs

“Strongly regular graphs”

We consider simple connected strongly regular graphs with $n \leq 15$ vertices.

$n = 2.$

- Complete graph $K_2$

$n = 3.$

- Complete graph $K_3$

$n = 4.$

- Cycle $C_4$
- Complete graph $K_4$

$n = 5.$

- Cycle $C_5$
- Complete graph $K_5$

$n = 6.$

- Complete bipartite graph $K_{3,3}$
- Cocktail party graph $CP(3)$
- Complete graph $K_6$

$n = 7.$

- Complete graph $K_7$

$n = 8.$

- Complete bipartite graph $K_{4,4}$
- Cocktail party graph $CP(4)$
- Complete graph $K_8$

$n = 9.$

- Square lattice graph $L_2(3)$
- Complete tripartite graph $K_{3,3,3}$
- Complete graph $K_9$
A. 12. Distance regular graphs

\( n = 10. \)

- Petersen graph
- Complete bipartite graph \( K_{5,5} \)
- Triangular graph \( T(5) \)
- Cocktail party graph \( CP(5) \)
- Complete graph \( K_{10} \)

\( n = 11. \)

- Complete graph \( K_{11} \)

\( n = 12. \)

- Complete bipartite graph \( K_{6,6} \)
- Complete tripartite graph \( K_{4,4,4} \)
- Complete 4-partite graph \( K_{3,3,3,3} \)
- Cocktail party graph \( CP(6) \)
- Complete graph \( K_{12} \)

\( n = 13. \)

- Circulant graph \( Ci_{13}(1,3,4) \)
- Complete graph \( K_{13} \)
Distance regular graphs

“Weakly regular graphs”

We consider simple connected distance regular graphs of not strongly regular with $n \leq 15$ vertices.

$n = 14.$

- Circulant graph $C_{i_{14}}(1, 3, 5, 7)$
- Cocktail party graph $CP(7)$
- Complete graph $K_{14}$

$n = 6.$

- Cycle $C_6$

$n = 7.$

- Cycle $C_7$

$n = 8.$

- Cycle $C_8$
- Hamming graph $H(3, 2)$

$n = 9.$

- Cycle $C_9$

$n = 10.$

- Cycle $C_{10}$

$n = 15.$

- Circulant graph $C_{i_{15}}(1, 2, 4, 5, 7)$
- Circulant graph $C_{i_{15}}(1, 2, 3, 4, 6, 7)$
- Complete graph $K_{15}$

$n = 15.$

- Circulant graph $C_{i_{10}}(1, 3)$
A. 14 Distance regular graphs

\( n = 11. \)

- Cycle \( C_{11} \)

\( n = 12. \)

- Cycle \( C_{12} \)
- Icosahedron
- Bipartite graph with 6, 6-points

\( n = 13. \)

- Cycle \( C_{13} \)

\( n = 14. \)

- Cycle \( C_{14} \)
- Bipartite graph with 7, 7-points
- Bipartite graph with 7, 7-points
- Circulant graph \( Ci_{14}(1, 3, 5) \)

\( n = 15. \)

- Cycle \( C_{15} \)