Section 1.1.3

1 We have an edge for every distinct pairs of vertices, so $\binom{n}{2} = \frac{n(n-1)}{2}$.

2 We prove the contrapositive. Suppose $r_1 \neq r_2$, $|X| = r_1$ and $|Y| = r_2$. Then for $x \in X$, $deg(x) = r2$ and for $y \in Y$ $deg(y) = r1$, but $r2 \neq r1$, so K_{r_1,r_2} is not regular.

3 No, no matter which 4 vertices you choose, 2 of them will be in the same subset, and would have no edges between them.

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8 Suppose G and H are isomorphic. There exists a bijection f from $V(G)$ to $V(H)$ such that $xy \in E(G) \Leftrightarrow f(x)f(y) \in E(H)$.

$$xy \in E(\overline{G}) \Leftrightarrow xy \notin E(G) \Leftrightarrow f(x)f(y) \notin E(H) \Leftrightarrow f(x)f(y) \in E(\overline{H})$$

. Thus the complements are isomorphic.

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