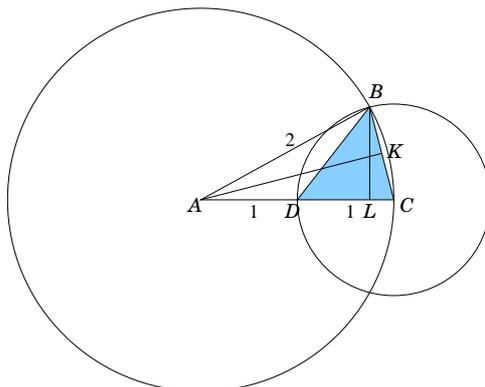


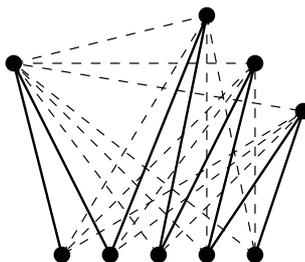
Practice Test 3 - Solutions

- See problem 9 in chapter 10.
- Label the points as shown in the picture below, where AK and BL are heights of the triangle ABC .



Since $AB = AC$, the triangle ABC is isosceles. $|BC| = 1$, therefore $|BK| = \frac{1}{2}$, and by Pythagorean theorem $|AK| = \sqrt{2^2 - (\frac{1}{2})^2} = \sqrt{\frac{15}{4}} = \frac{\sqrt{15}}{2}$. Using base BC and height AK , the area of triangle ABC is $\frac{1}{2} \cdot 1 \cdot \frac{\sqrt{15}}{2} = \frac{\sqrt{15}}{4}$. On the other hand, using base AC and height BL , its area is $\frac{1}{2} \cdot 2 \cdot |BL| = |BL|$. Therefore $|BL| = \frac{\sqrt{15}}{4}$. Then the area of triangle BCD is $\frac{1}{2} \cdot 1 \cdot \frac{\sqrt{15}}{4} = \frac{\sqrt{15}}{8}$.

- A Hamilton path is shown:



There is no Hamilton cycle because among 9 vertices, 5 are in one set. Thereofe if a Hamilton cycle existed then at least 2 of these 5 would be consecutive in the cycle. However, they cannot be joined because since they are in one set.

- See problem 19 in chapter 14.

- Hint: see problem 21 in chapter 10.