

IB (Mathematics)

1 Answer the following questions.
Write your answer in the answer sheet.

(1) Simplify $\sqrt{12} \times \sqrt{6} - \frac{\sqrt{40}}{\sqrt{5}}$

(2) Fully factor $x^2 - x - 20$

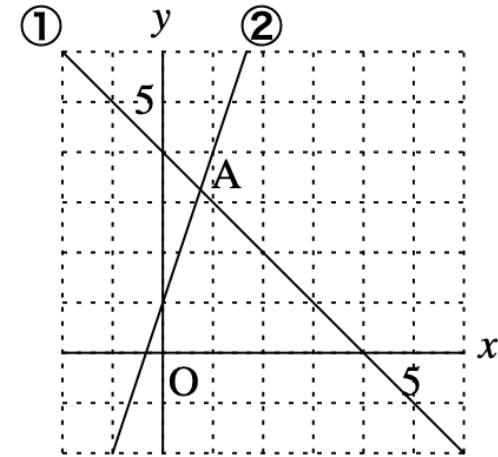
(3) Fully factor $4x^2 - 49$

(4) Fully factor $a^2x^2 + 7a^2x - 44a^2$

2 There are four cards "1", "2", "3", and "4". Two cards are randomly selected and arranged from left to right in order of selection.

- (1) Find the probability that the resulting integer will be a multiple of 7.
- (2) Find the probability that the resulting integer is a prime number.

3 There are two straight lines ① and ② in the figure on the right. A is the point where the straight lines ① and ② intersect. Find the coordinates of point A.



4 In the figure below, $\triangle ABC$ is a right triangle with $\angle BAC = 90^\circ$. AD is perpendicular to side BC, and the bisector of $\angle DBA$ intersects AD at point E. From point E, draw a line parallel to AC, this line intersects with side BC at point F.

Prove that $\triangle BEA \cong \triangle BEF$.

