

[Pre-2nd Kyu] Section 1: Calculation Test**1**

Answer the following.

- (1) Expand and simplify the following expression.

$$x(x+2) - (x-1)(x+3)$$

- (2) Factor the following expression.

$$9x^2 - y^2$$

- (3) Solve for x in the following equation.

$$x^2 - 5x + 6 = 0$$

- (4) Simplify the following expression.

$$(1 - \sqrt{5})^2 + \sqrt{20}$$

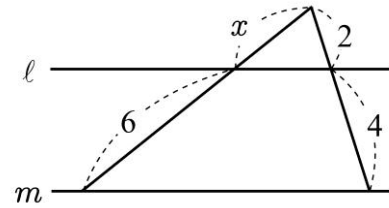
- (5) y is directly proportional to the square of x and $y=1$ when $x=2$. Express y in terms of x .

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Answer the following.

- (6) Find the length of the side of a square whose length of the diagonal is 4 cm.

- (7) In the diagram on the right, find the value of x when $\ell \parallel m$.



- (8) Expand and simplify the following expression.

$$(x + y)(x^2 - xy + y^2)$$

- (9) Factor the following expression.

$$x^3 + 3x^2y + 3xy^2 + y^3$$

- (10) Simplify the following expression.

$$\frac{4}{\sqrt{3}-1} + (1-\sqrt{3})(3+\sqrt{3})$$

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Answer the following.

- (11) For the parabola $y = -x^2 + ax + b$, find the values of a and b such that the coordinates of the vertex is $(1, 2)$.
- (12) How many different three-member teams can be formed from nine students?
- (13) Solve for x in the inequality $2x^2 - 5x - 3 > 0$.
- (14) Answer the following when $\sin \theta = \frac{1}{2}$ for $0^\circ < \theta < 90^\circ$.
- ① Find the value of $\cos \theta$.
 - ② Find the value of $\tan \theta$.
- (15) Answer the following for two sets, $A = \{2, 3, 5, 7\}$ and $B = \{1, 2, 3, 4\}$.
- ① Find the elements of set $A \cup B$ and list them using set notation.
 - ② Find the number of elements in set $A \cap B$.