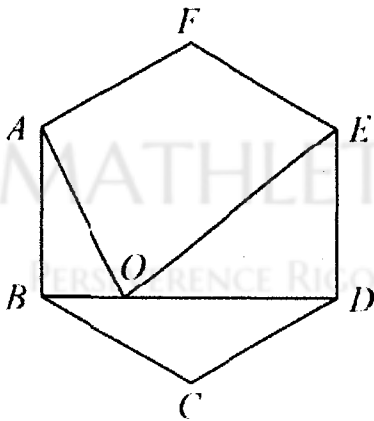


1. $x = \sqrt{2022} + 3$, $\left(\frac{x+3}{x^2-3x} - \frac{x-1}{x^2-6x+9}\right) \div \frac{x-9}{x} = ?$
(A) $\frac{1}{2013}$ (B) $\frac{1}{2016}$ (C) $\frac{1}{2022}$ (D) $\frac{1}{2025}$

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2. As shown below, point O is on diagonal \overline{BD} of a rectangular hexagon $ABCDEF$. If $S_{\triangle ABO} = 2$, $S_{\triangle EOD} = 8$, find S_{ABCDEF} .



- (A) 20 (B) 30 (C) 40 (D) 45

3. Suppose the equation $x^2 + ax + 4a = 0$ only has integer roots. How many value of a 's are there?

- (A) 4 (B) 6 (C) 8 (D) 10

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4. Set $a_{n+1} = \sqrt{1 + a_n^2}$. If $a_1 = \sqrt{10}$, how many integers are there among $a_1, a_2, \dots, a_{2022}$?

- (A) 42 (B) 43 (C) 32 (D) 33

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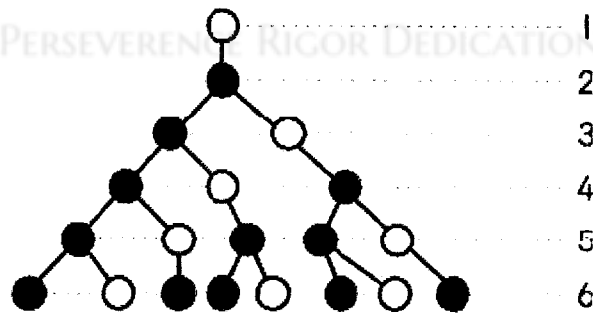
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5. $\frac{x}{1 \times 2} + \frac{x}{2 \times 3} + \frac{x}{3 \times 4} + \dots + \frac{x}{2022 \times 2023} = 2022, x = ?$
 (A) $\frac{1}{2021}$ (B) $\frac{1}{2022}$ (C) 2022 (D) 2023

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6. According to the pattern, the 11th level has a black dots \bullet and b white dots \circ . Find $a + 2b$.



- (A) 165 (B) 144 (C) 132 (D) 123

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7. Divide numbers 1, 2, 3, 4, 5, 6, 7, 8 and 9 into three groups, and each forms a 3-digit number without repetition. Suppose the largest 3-digit number is 3 times the smallest 3-digit number, and the second largest 3-digit number is 2 times the smallest 3-digit number. How many groups of number combination satisfy the conditions above?
- (A) 1 (B) 2 (C) 3 (D) 4

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8. Tom and Jerry play a game. Every round, each of them plays a card from their hand. The one with a larger number wins 1 point. If it is a tie, both of them will not score. Suppose each card can only be used once, after five rounds, how many scoring ways are there?

Tom 21 22 24 25 28

Jerry 20 22 23 24 27

- (A) 12 (B) 11 (C) 10 (D) 9

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9. If $a^3 = b^3 + 515$, $a = b + 5$, find ab .
 (A) 26 (B) 24 (C) 22 (D) 19

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10. Start from the 'W' in the upper left corner, a mouse follows the route of "WMI 2022" from one square to the next square with a common side. How many different routes are there to walk these 7 squares?

W	M	I	2	
M	1	2	0	
1	2	0	2	2
2	0	2	2	
		2		

- (A) 36 (B) 40 (C) 46 (D) 48

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