

Mathlete Training Centre
WMI 2022 GRADE 8A

1. Given that $40^2=1600$ and $50^2= 2500$. If n is an integer, and $n < \sqrt{2022} < n + 1$, find n .
(A) 47 (B) 45 (C) 44 (D) 43

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2. Find the hundreds digit of 9999.98×9999.98 .
(A) 4 (B) 5 (C) 6 (D) 8

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3. Which option below is the factor of $2(x - 1)^2 + 5(x - 1) + 3$?
(A) x (B) $x - 1$ (C) $x + 1$ (D) $2x + 3$

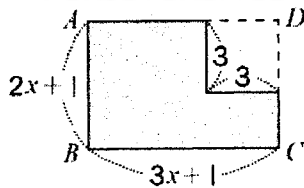
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4. In the picture, a rectangle $ABCD$ is $3x + 1$ in length and $2x + 1$ in width. If a square whose side length is 3 is cut from the rectangle, find the perimeter of the remaining part.

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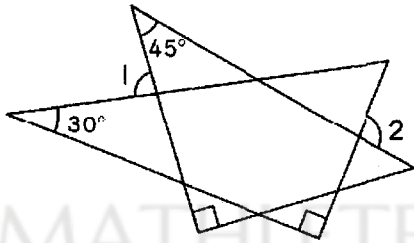


- (A) $10x$ (B) $10x - 2$ (C) $10x - 4$ (D) $10x + 4$

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5. A pair of set squares are placed as below. If $\angle 1 = 80^\circ$, find $\angle 2$.



- (A) 80° (B) 95° (C) 100° (D) 105°

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6. In $\triangle ABC$, $\overline{AB} = \sqrt{6} + 1$, $\overline{BC} = 2 + \sqrt{3}$, and $\overline{AC} = \sqrt{2} + \sqrt{5}$. Find the relation among $\angle A$, $\angle B$ and $\angle C$.
- (A) $\angle A > \angle B > \angle C$ (B) $\angle B > \angle A > \angle C$ (C) $\angle C > \angle B > \angle A$
 (D) $\angle A > \angle C > \angle B$

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7. Suppose $a, b, 48, c, d,$ and 30 make an arithmetic sequence; b, x, d and y make a geometric sequence. Find y .

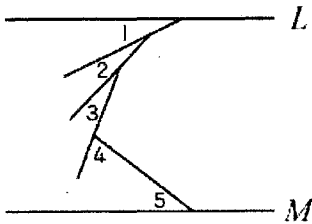
- (A) $12\sqrt{3}$ (B) $12\sqrt{6}$ (C) $18\sqrt{2}$ (D) $18\sqrt{6}$

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8. As shown in the picture, $L \parallel M$, $\angle 1 = \angle 3 = 35^\circ$. Find $\angle 1 + \angle 2 + \angle 3 + \angle 4 + \angle 5$. (\parallel : parallel)

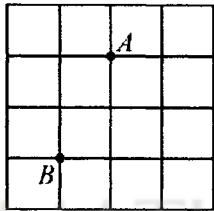


- (A) 180° (B) 200° (C) 210° (D) 240°

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9. Two grid points A and B are on a piece of 4×4 square paper. Find a grid point C to make $\triangle ABC$ an isosceles right triangle. How many such point C 's are there?



- (A) 1 (B) 2 (C) 3 (D) 4

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10. Company W uses the linear function to adjust employee's salary. Below shows the monthly salary of three employees in 2021 and 2022. How much is Max's monthly salary in 2021?

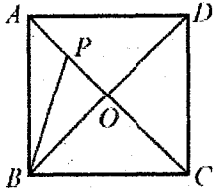
	Jenny	Paul	Max
2021	\$500	\$400	?
2022	\$700	\$500	\$1200

- (A) \$700 (B) \$750 (C) \$800 (D) \$900

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11. In the picture, $ABCD$ is a square, and $\overline{AP}=7$, $\overline{BP}=13$. Find the area of $ABCD$.



- (A) 240 (B) 256 (C) 288 (D) 289

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12. Set $f(n) = 4n - 90$, in which n is a positive integer. If $f(1) + f(2) + f(3) + \dots + f(n) = 0$, find n .

- (A) 34 (B) 36 (C) 44 (D) 46

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13. Set the median of the ten numbers 1, 3, 3, 4, 5, 5, 6, 7, 7 and 9 to be a . If a number is taken out at will from these ten numbers, find the probability that such number is larger than a .
- (A) $\frac{2}{5}$ (B) $\frac{3}{5}$ (C) $\frac{1}{4}$ (D) $\frac{2}{3}$

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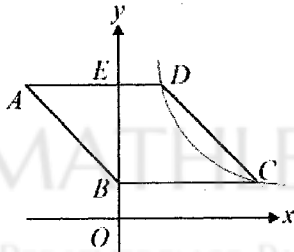
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14. Given that k is a root of the quadratic equation $x^2 + 2x - 8 = 0$. Find $(k-3)(k+3)(k-1)(k+5)$.
- (A) 20 (B) -15 (C) -20 (D) -35

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15. Given a rhombus $ABCD$ on the rectangular coordinate plane. Suppose its side $\overline{AD} \perp y\text{-axis}$ on E , point B is on $y\text{-axis}$, $\overline{BC}=5$, $\overline{BE} = 2\overline{DE}$, and the graph of the inverse function $y = \frac{k}{x} (x > 0)$ passes through points C and D at the same time. Find k .



- (A) $\frac{20}{3}$ (B) $\frac{40}{3}$ (C) $\frac{5}{2}$ (D) $\frac{5}{4}$

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