



1

In the subtraction question $\begin{array}{r} 4 \heartsuit 7 \\ 189 \\ - 268 \end{array}$, the $\heartsuit$ represents the digit

- (A) 2 (B) 8 (C) 7 (D) 5 (E) 4

A	E	B	B	C	C	D	D	E	A
---	---	---	---	---	---	---	---	---	---

3

The areas of three squares are 16, 49 and 169. What is the average (mean) of their side lengths?

- (A) 8 (B) 12 (C) 24 (D) 39 (E) 32

A	D	B	E	C	A	D	B	E	C
---	---	---	---	---	---	---	---	---	---

5

If Corina had added the numbers P and Q correctly, the answer would have been 16. By mistake, she subtracted Q from P . Her answer was 4. What is the value of P ?

- (A) 4 (B) 5 (C) 8 (D) 10 (E) 16

A	E	B	D	C	C	D	A	E	B
---	---	---	---	---	---	---	---	---	---

7

Three balls numbered 1, 2, and 3 are placed in a bag. A ball is drawn from the bag and the number is recorded. The ball is returned to the bag. After this has been done three times, what is the probability that the sum of the three recorded numbers is less than 8?

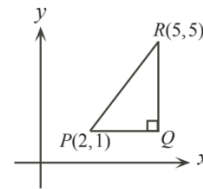
- (A) $\frac{23}{27}$ (B) $\frac{5}{7}$ (C) $\frac{5}{9}$ (D) $\frac{8}{9}$ (E) $\frac{22}{27}$

A	B	B	E	C	A	D	C	E	D
---	---	---	---	---	---	---	---	---	---

2

In the diagram, $\triangle PQR$ is right-angled at Q , PQ is horizontal and QR is vertical. What are the coordinates of Q ?

- (A) (5, 2) (B) (5, 0) (C) (5, 1)
(D) (4, 1) (E) (1, 5)



A	D	B	A	C	C	D	B	E	E
---	---	---	---	---	---	---	---	---	---

4

In the subtraction shown, M and N each represent a single digit. What is the value of $M + N$?

- (A) 14 (B) 12 (C) 15
(D) 13 (E) 11

$$\begin{array}{r} \boxed{M} \boxed{4} \\ - \boxed{3} \boxed{N} \\ \hline \boxed{1} \boxed{6} \end{array}$$

A	B	B	C	C	D	D	A	E	E
---	---	---	---	---	---	---	---	---	---

6

The set $S = \{1, 2, 3, \dots, 49, 50\}$ contains the first 50 positive integers. After the multiples of 2 and the multiples of 3 are removed, how many integers remain in the set S ?

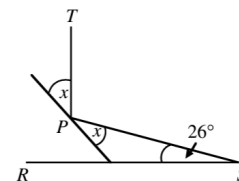
- (A) 8 (B) 9 (C) 16 (D) 17 (E) 18

A	B	B	C	C	A	D	D	E	E
---	---	---	---	---	---	---	---	---	---

8

A beam of light shines from point S , reflects off a reflector at point P , and reaches point T so that PT is perpendicular to RS . Then x is

- (A) 26° (B) 32° (C) 37°
(D) 38° (E) 45°



A	C	B	E	C	D	D	B	E	A
---	---	---	---	---	---	---	---	---	---



9

A number is formed using the digits 1, 2, ..., 9. Any digit can be used more than once, but adjacent digits cannot be the same. Once a pair of adjacent digits has occurred, that pair, in that order, cannot be used again. How many digits are in the largest such number?

(A) 72 (B) 73 (C) 144 (D) 145 (E) 91

10

A palindrome is a positive integer whose digits are the same when read forwards or backwards. For example, 2882 is a four-digit palindrome and 49194 is a five-digit palindrome. There are pairs of four-digit palindromes whose sum is a five-digit palindrome. One such pair is 2882 and 9339. How many such pairs are there?

(A) 28 (B) 32 (C) 36 (D) 40 (E) 44

A

C

B

A

C

D

D

E

E

B

A

E

B

D

C

C

D

B

E

A