

Q1: $\frac{1+0.1}{11} + \frac{2+0.2}{22} + \frac{3+0.3}{33} = ?$

- A) 0.3 B) 0.11 C) 0.123 D) 10

Solution:

$$\frac{1.1}{11} + \frac{2.2}{22} + \frac{3.3}{33} = 0.1 + 0.1 + 0.1 = 0.3$$

Answer: A

Q2: $\sqrt{2.25} - (\sqrt{0.09} - \sqrt{0.64}) = ?$

- A) 2.6 **B) 2** C) 1 D) 0.4

Solution:

$$1.5 - (0.3 - 0.8) = 1.5 - (-0.5) = 1.5 + 0.5 = 2$$

Answer: B

Q3: If $a + b = 19$, $b = \frac{c}{4}$ and $c = 28$, then what is the value of a ?

- A) 10 **B) 12** C) 14 D) 16

Solution:

$$b = \frac{c}{4} = \frac{28}{4} = 7, \quad a + b = a + 7 = 19, \quad a = 12$$

Answer: B

Q4: Which of the following is correct for $\left(\frac{1}{2}\right)^5$?

- A) It is less than zero
 B) It is greater than 1
 C) It is between $\frac{1}{2}$ and 1
D) It is between 0 and $\frac{1}{2}$

Solution:

$$\left(\frac{1}{2}\right)^5 = \frac{1}{32}, \text{ so it is between 0 and } \frac{1}{2}$$

Answer: D

Q5: Which of the following numbers should be multiplied by $\sqrt{75} + \sqrt{48}$ to get an integer?

- A) $\sqrt{10}$ B) $\sqrt{5}$ **C) $\sqrt{3}$** D) $\sqrt{2}$

Solution:

$$5\sqrt{3} + 4\sqrt{3} = 8\sqrt{3}, \quad 8\sqrt{3} \times \sqrt{3} = 24, \text{ so it is } \sqrt{3}$$

Answer: C

Q6: What is the perimeter of a square if its area is 108 cm^2 ?

- A) $12\sqrt{3}$ B) $18\sqrt{3}$ **C) $24\sqrt{3}$** D) $28\sqrt{2}$

Solution:

$$a^2 = 108 \text{ cm}^2, \quad \sqrt{a^2} = \sqrt{108}, \quad a = 6\sqrt{3}, \quad 4a = 24\sqrt{3}$$

Answer: C

Q7: Which of the following is correct?

- A) $\sqrt{12} = 4\sqrt{3}$ B) $\sqrt{24} = 4\sqrt{3}$
 C) $\sqrt{45} = 5\sqrt{3}$ **D) $\sqrt{12} = 2\sqrt{3}$**

Solution:

$$\sqrt{12} = 2\sqrt{3}, \quad \sqrt{24} = 2\sqrt{6}, \quad \sqrt{45} = 3\sqrt{5}, \quad \sqrt{12} = 2\sqrt{3}.$$

Answer: D

Q8: What is the minimum sum of two different natural numbers?

- A) 1 B) 2 C) 0 **D) 3**

Solution:

1 and 2 are smallest natural numbers. So $1 + 2 = 3$

Answer: D

Q9: What is the diameter of a circle with a circumference of 5?

- A) $\frac{5}{\pi}$ B) $\frac{10}{\pi}$ C) 5 D) 5π

Solution:

$$2\pi r = 5, r = \frac{5}{2\pi}, D = 2r = \frac{5}{\pi}$$

Answer: A

Q10: The ratio of two numbers is k, what will be the new ratio if both are multiplied by 12?

- A) $12k$ **B) k** C) $\frac{k}{12}$ D) $k + 12$

Solution:

Suppose $\frac{a}{b} = k, \frac{a \times 12}{b \times 12} = \frac{a}{b} = k$

Answer: B

Q11: There are some numbers which remain same when they are written backwards. (Example: 323)

How many such three-digit numbers are there?

- A) 50 **B) 90** C) 120 D) 180

Solution:

First and third digits should be same like 1a1, 2a2, 3a3...8a8, 9a9. There are 9 options like this. Additionally there are 10 options for a like 0, 1, 2 ...8, 9. So we can write $9 \times 10 = 90$ three-digit numbers

Answer: B

Q12: x and y are directly proportional and $x = 12$ when $y = 18$.

What is the value of y if $x = 4$?

- A) 5 **B) 6** C) 7 D) 8

Solution:

$$\frac{x}{y} = k, \frac{12}{18} = \frac{2}{3} = k, \frac{4}{y} = \frac{2}{3}, y = 6$$

Answer: B

Q13: Simplify $\frac{a(a-b) - b(a-b)}{a-b}$

- A) $a+b$ **B) $a-b$** C) $\frac{a+b}{a-b}$ D) $\frac{a-b}{a+b}$

Solution: $\frac{(a-b)(a-b)}{a-b} = a-b$

Answer: B

Q14: $2\sqrt{2}(\sqrt{4-\sqrt{8}} \times \sqrt{4+\sqrt{8}}) = ?$

- A) 8** B) $4\sqrt{2}$ C) $8\sqrt{2}$ D) 16

Solution:

$$2\sqrt{2}(\sqrt{4^2 - (\sqrt{8})^2}) = 2\sqrt{2}(\sqrt{8}) = 8$$

Answer: A

Q15: $(-3)^2 - [(-13+5) \div (-4)+3]^2 = ?$

- A) 4 B) 8 C) -8 **D) -16**

Solution:

$$(-3)^2 - [(-8) \div (-4) + 3]^2 = 9 - [2 + 3]^2 = 9 - 25 = -16$$

Answer: D

Q16: If n is an even integer, which of the following is always an odd integer?

- A) $3n - 2$ **B) $3(n + 1)$**
 C) $n - 2$ D) $\frac{n}{3}$

Solution:

$3n - 2$ always even, $3(n + 1)$ always odd,
 $n - 2$ always even, $\frac{n}{3}$ always even.

Answer: B

Q17: If b is equal to 40% of a , then what will be 40% of $4a$?

- A) $\frac{b}{40}$ B) $\frac{b}{4}$ C) b **D) $4b$**

Solution:

$$a \times \frac{40}{100} = b, a \times \frac{2}{5} = b, 5b = 2a, 10b = 4a,$$

$$4a \times \frac{40}{100} = 10b \times \frac{40}{100} = 4b$$

Answer: D

Q18: Which of the following should be replaced with t in order to simplify $\frac{a^2 - a - 2}{a^2 - t}$?

- A) -4 B) -2 C) 2 **D) 4**

Solution:

$$\frac{a^2 - a - 2}{a^2 - 4} = \frac{(a - 2)(a + 1)}{(a - 2)(a + 2)} \text{ or}$$

$$\frac{a^2 - a - 2}{a^2 - 1} = \frac{(a - 2)(a + 1)}{(a + 1)(a - 1)}. \text{ So } t \text{ should be } 1 \text{ or } 4.$$

Answer: D

Q19: The ages of seven brothers are consecutive even numbers.

What is the difference of the ages of the smallest one and the eldest one?

- A) 12** B) 14 C) 20 D) 24

Solution:

**Ages of 7 brothers can be like this: $a, a+2, a+4, a+6, a+8, a+10, a+12$.
 So the difference will be $(a+12) - a = 12$**

Answer: A

Q20: If $p = -\frac{1}{q}$, $q = -\frac{1}{r}$, $r = -\frac{1}{s}$ and $s = -\frac{1}{4}$, what is the value of p ?

- A) -4 B) $-\frac{1}{4}$ **C) 4** D) $\frac{1}{4}$

Solution:

$$r = 4, q = -\frac{1}{4}, p = 4$$

Answer: C

Q21: a is an integer and $a\frac{1}{5} = \frac{21}{5}$, what is the value of a ?

- A) 4** B) 5 C) 6 D) 7

Solution:

$$a\frac{1}{5} = \frac{21}{5} = 4\frac{1}{5}, a = 4$$

Answer: A

Q22: What is the value of $\frac{3a-2b}{a+b}$ if $\frac{a}{b} = \frac{5}{3}$?

- A) $\frac{9}{8}$ B) $\frac{5}{8}$ C) $\frac{7}{8}$ D) $\frac{11}{8}$

Solution:

$$\frac{a}{b} = \frac{5}{3} = \frac{5k}{3k}, \frac{3(5k)-2(3k)}{5k+3k} = \frac{15k-6k}{8k} = \frac{9k}{8k} = \frac{9}{8}$$

Answer: A

Q23: How many digits are to be used in order to count from 1 to 100?

- A) 100 B) 150 C) 190 **D) 192**

Solution:

1 to 9, 9 digits;
10 to 99, $90 \times 2 = 180$ digits;
100, 3 digits
Total $9 + 180 + 3 = 192$ digits

Answer: D

Q24: What is the value of $a+b+c$ if $a=2b$, $b=3c$ and $c=4d$?

- A) 40d** B) 24d C) 20d D) 12d

Solution:

$$b = 3c = 3(4d) = 12d, a = 2b = 2(12d) = 24d$$

$$a+b+c = 24d+12d+4d = 40d$$

Answer: A

Q25: What is the value of $(5(4+3))^2$?

- A) 144 B) 245 **C) 1225** D) 5432

Solution:

$$(5(7))^2 = (35)^2 = 1225$$

Answer: C

Q26: Which of the following is an odd number if x is an odd number and y is an even number?

- A) $2x+3y$ B) $3x+2y$
C) $4x+y$ **D) $2(x+3y)$**

Solution:

$2x+3y$ always even, $3x+2y$ always odd,
 $4x+y$ always even, $2(x+3y)$ always even

Answer: B

Q27: A teacher is distributing beans to the students for an experiment in a way that the first student gets 3. How many beans will n^{th} student will get if every next student gets 2 more than the previous student?

- A) $2n+1$** B) $2n+3$ C) $3n+2$ D) $n+2$

Solution:

$$3 + 0 \times 2$$

$$3 + 1 \times 2$$

$$3 + 2 \times 2$$

$$3 + 3 \times 2$$

$$\cdot$$

$$\cdot$$

$$\cdot$$

$$3 + (n-1) \times 2 = 3 + 2n - 2 = 2n + 1$$

Answer: A

Q28: When the number ABC23 is divided by ABC, the quotient is M and the remainder is K.

What is M+K?

- A) 24 B) 33 **C) 123** D) 1023

Solution: M = 100, K = 23, M + K = 123

Answer: C

Q29: Evaluate $(-1)^2 + 1^2 + [(18 \div 3) \div 2] - 3 - 2$.

- A) 0** B) 3 C) -3 D) 15

Solution: $1+1+[6 \div 2]-3-2=2+3-5=0$

Answer: A

Q30: If $\frac{x-2006}{2} = x+2$, then find x .

- A) -2010 B) -1001 C) 1001 D) 2010

Solution:

$$x - 2006 = 2(x + 2)$$

$$x - 2006 = 2x + 4$$

$$2x - x = -2006 - 4$$

$$x = -2010$$

Answer: A

Q31: If $\frac{\sqrt{x}}{2} = 2\sqrt{2}$, what is the value of x ?

- A) 4 B) 16 C) $16\sqrt{2}$ **D) 32**

Solution:

$$\sqrt{x} = 2(2\sqrt{2})$$

$$(\sqrt{x})^2 = (4\sqrt{2})^2$$

$$x = 32$$

Answer: D

Q32: Jamila's average (arithmetic mean) score for six tests was 92. If the sum of the scores of two of her tests was 188, then what was her average score for the other four tests?

- A) 90 **B) 91** C) 92 D) 94

Solution:

Jamila's total score for six tests $92 \times 6 = 552$

the sum of the scores of two of her tests is 188

the sum of the scores of remaining four of her tests is $552 - 188 = 364$

Jamila's average (arithmetic mean) score for remaining four of her tests is

$$364 \div 4 = 91$$

Answer: B

Q33: When x is divided by 5 and when it is divided by

4, the remainders are same. Which of the following can be the value of x ?

- A) 55 **B) 83** C) 72 D) 90

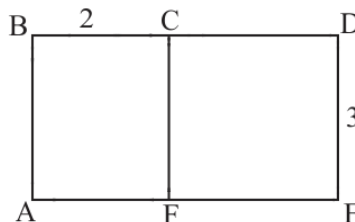
Solution:

83 is divided by 5, the remainder is 3

83 is divided by 3, the remainder is 3

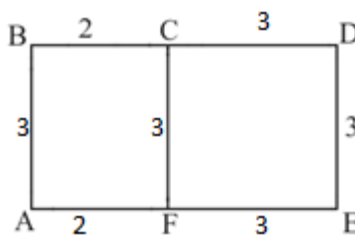
Answer: B

Q34: In the figure below, how much is the perimeter of square FCDE smaller than the perimeter of rectangle ABDE?



- A) 2 B) 3 **C) 4** D) 7

Solution:



the perimeter of square FCDE is $3 \times 4 = 12$

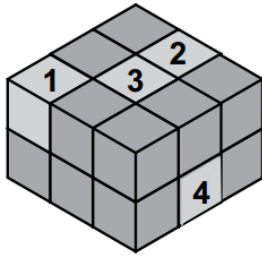
the perimeter of rectangle ABDE is $2 \times 3 + 2 \times 5 = 16$

$$16 - 12 = 4$$

Answer: C

Q35: The cube given below is formed by unit cubes and some of them are numbered by 1, 2, 3 and 4. Which

of the following unit cube does not change the total surface area when it is removed?

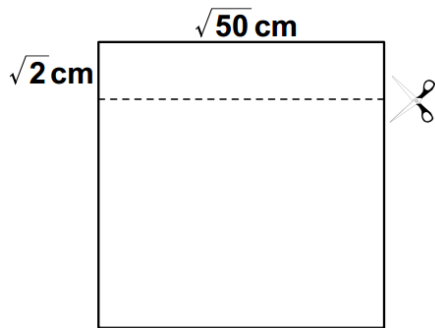


- A) 1 B) 2 C) 3 D) 4

Solution:
When cube 1 is removed, there will be still 3 faces. So total surface area does not change

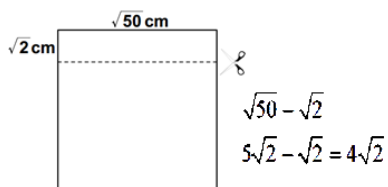
Answer: A

Q36: A square with a side $\sqrt{50}$ is given and a small part with a side $\sqrt{2}$ is removed. What is the perimeter of the remaining part?



- A) $5\sqrt{2}$ B) $13\sqrt{2}$ C) $18\sqrt{2}$ D) $20\sqrt{2}$

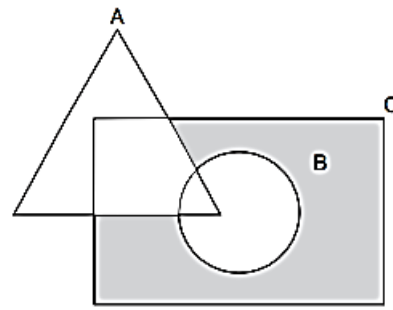
Solution:



the perimeter of the remaining part is
 $2 \times 5\sqrt{2} + 2 \times 4\sqrt{2} = 18\sqrt{2}$

Answer: C

Q37: Which one of the following represents the shaded area in Venn diagram?



- A) $(C \cap B^c) - A$ B) $C - (A \cup B)$
C) $(C - B) - A$ D) $(A \cup B)^c - C$

Solution:

Answer: B

Q38: What is the value of x in the following equation?

$$\frac{1}{\frac{1}{x} + \frac{1}{2}} + \frac{1}{\frac{1}{x} + \frac{1}{2}} = \frac{x}{48}$$

- A) 94 B) 47 C) 25 D) 20

Solution:

$$\frac{1}{\frac{1}{x} + \frac{1}{2}} + \frac{1}{\frac{1}{x} + \frac{1}{2}} = \frac{x}{48} \Rightarrow$$

$$\frac{1}{\frac{1}{x} + \frac{1}{2}} + \frac{1}{\frac{1}{x} + \frac{1}{2}} = \frac{x}{48} \Rightarrow$$

$$\frac{2x}{(x+2)} + \frac{2x}{(x+2)} = \frac{x}{48} \Rightarrow \frac{4x}{x+2} = \frac{x}{48} \Rightarrow x+2 = 96$$

$$\frac{x+2}{4x} + \frac{x+2}{4x} = \frac{x}{48} \Rightarrow \frac{4x}{x+2} = \frac{x}{48} \Rightarrow x+2 = 96$$

$$x = 94$$

Answer: B

Q39: According to the table below, what is the value of $x + y$?

MERCHANDISE SALES		
Type	Amount of Sales	Percent of Total Sales
Shoes	\$12,000	15%
Coats	\$20,000	25%
Shirts	x	40%
Pants	y	20%

- A) \$32,000 **B) \$48,000**
 C) \$60,000 D) \$68,000

Solution:

$$x+y = 40\% + 20\% = 60\%$$

$$\$20,000 \rightarrow 25\%$$

$$x+y \rightarrow 60\%$$

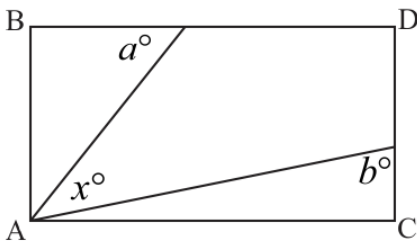
(Cross Multiplication)

$$20000 \times 60 = 25(x+y)$$

$$(x+y) = \$48000$$

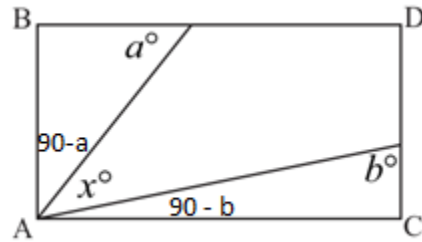
Answer: B

Q40: In rectangle $ABCD$ below, what is $a + b$ in terms of x ?



- A) $90 + x$** B) $90 - x$
 C) $180 + x$ D) $270 - x$

Solution:



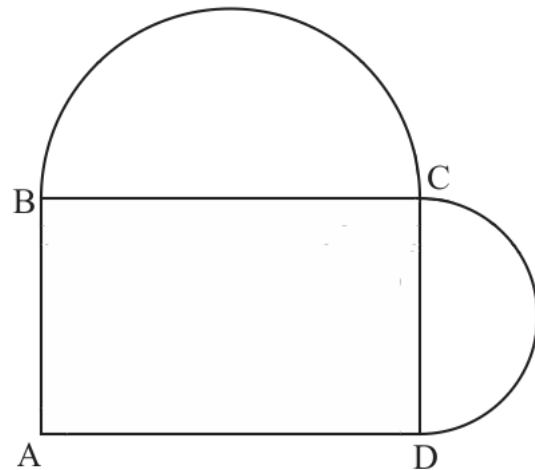
$$90^\circ - a^\circ + 90^\circ - b^\circ + x^\circ = 90^\circ$$

$$180^\circ - a^\circ - b^\circ + x^\circ = 90^\circ$$

$$x^\circ + 90^\circ = a^\circ + b^\circ$$

Answer: A

Q41: In the figure below, if semicircular arc BC has a length 6π and semicircular arc CD has a length 4π , what is the area of the rectangle $ABCD$?



- A) 96** B) 108 C) 144 D) 154

Solution:

$$\frac{2\pi r_1}{2} = 6\pi, r_1 = 6, BC = 2r_1 = 12$$

$$\frac{2\pi r_2}{2} = 4\pi, r_2 = 4, CD = 2r_2 = 8$$

the area of the rectangle $ABCD =$

$$12 \times 8 = 96$$

Answer: A

Q42: A square has a side of $2x$. And the second square has a side of $3x$ then what is the ratio of the area of the first square to the area of the second?

- A) $\frac{2}{3}$ B) $\frac{1}{6}$
 C) $\frac{3}{2}$ D) $\frac{4}{9}$

Solution:

the area of the first square = $(2x)(2x) = 4x^2$
 the area of the second square = $(3x)(3x) = 9x^2$
 the ratio of the area of the first square to the area of the second
 $\frac{4x^2}{9x^2} = \frac{4}{9}$

Answer: D

Q43: If one worker can pack 15 boxes every two minutes and another can pack 15 boxes every three minutes, how many minutes will it take these two workers, working together, to pack 300 boxes?

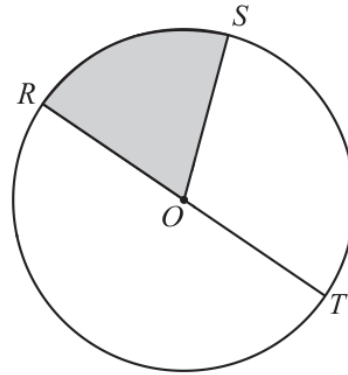
- A) 10 B) 12 C) 15 D) 24

Solution:

15 boxes → 2 min.(First Man)
 15 boxes → 3 min.(Second Man)
 10 boxes → 2 min.(Second Man)
 15+10 boxes → 2 min.(Together)
 300 boxes → 24 min.

Answer: D

Q44: In the figure below, RT is the diameter of the circle with center O . The shaded portion of the figure has an area of 25π and it is $\frac{1}{9}$ the area of the entire circle. What is the length of arc RST ?



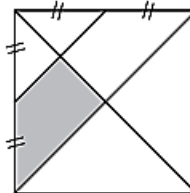
- A) 15π B) 25π
 C) 30π D) 112.5π

Solution:

$\frac{1}{9} \pi r^2 = 25\pi, r^2 = 225$
 $r = 15,$
 the length of arc = $\frac{2\pi r}{2} = \frac{2\pi(15)}{2} = 15\pi$

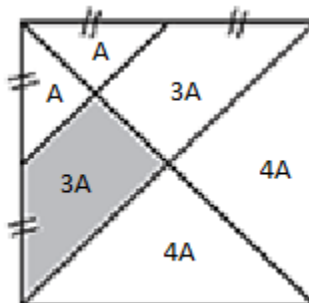
Answer: A

Q45: Which of the following fraction can express the shaded area of the square?



- A) $\frac{1}{6}$ B) $\frac{1}{8}$ C) $\frac{3}{16}$ D) $\frac{1}{4}$

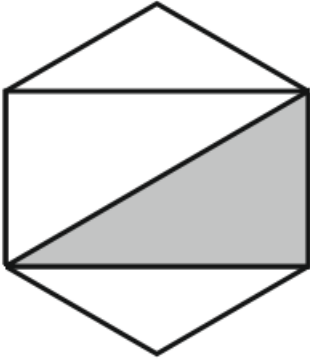
Solution:



We can write area of each region by using similarity
 So $\frac{3A}{16A} = \frac{3}{16}$

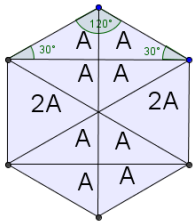
Answer: C

Q46: A rectangle is inscribed in a regular hexagon. What is the ratio of the shaded area to the area of hexagon?



- A) $\frac{1}{4}$ **B) $\frac{1}{3}$** C) $\frac{2}{5}$ D) $\frac{1}{6}$

Solution:



According to given figure above the ratio of the shaded area to the area of hexagon is $\frac{4A}{12A} = \frac{1}{3}$

Answer: B

Q47: The numbers 1, 2, 3 and 4 are to be placed in each row and column only once in the following game table.

1			
			3
	2		1
		4	

Which of the following numbers will be placed in the first row?

- A) 1, 3, 2, 4** B) 1, 2, 4, 3
C) 1, 2, 3, 4 D) 1, 4, 3, 2

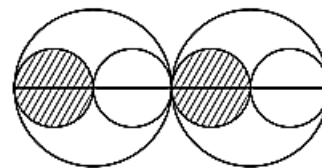
Solution:

1	3	2	4
2	4	1	3
4	2	3	1
3	1	4	2

So 1, 3, 2, 4

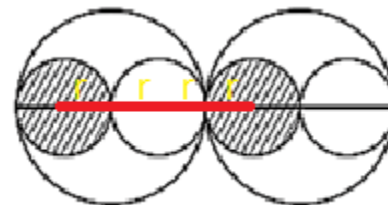
Answer: A

Q48: The distance between the centers of the shaded congruent circles is 28 cm. What is the circumference of the smaller circle? ($\pi = \frac{22}{7}$)



- A) 44** B) 48 C) 52 D) 56

Solution:



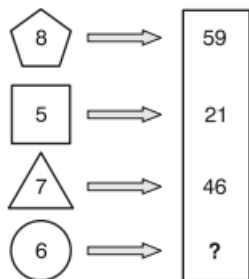
$$r + r + r + r = 28 \Rightarrow r = 7 \text{ cm}$$

the circumference of the smaller circle

$$2\pi r = (2)\left(\frac{22}{7}\right)(7) = 44 \text{ cm}^2$$

Answer: A

Q49: There is a relation between the figures and the numbers in above puzzle?



Which number will replace the question mark?

- A) 6 B) 8 **C) 36** D) 42

Solution:
Square of number – Number of sides of the figure

$$8^2 - 5 = 59$$

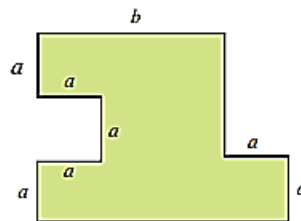
$$5^2 - 4 = 21$$

$$7^2 - 3 = 46$$

$$6^2 - 0 = 36$$

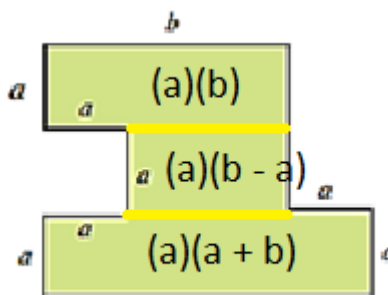
Answer: C

Q50: What is the area of the shape given below if all the sides are perpendicular?



- A) $3ab - a^2$ B) $2a^2 + 3ab$
C) $3ab$ D) $3ab - 2a^2$

Solution:



the area of the shape =
 $ab + a(b - a) + a(a + b) =$
 $ab + ab - a^2 + a^2 + ab = 3ab$

Answer: C