Q1: At least how many circles are there to form a cylinder?

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

Solution:

***One* circle is two dimensional figure(no thickness)**
***Two* circles form a cylinder-three dimensional figure (there is thickness)**

Answer: C

Q2: What is the value of $2^3 \times 2^2 \times 3^3 \times 3^2$?

A) 6^5 B) 6^8 C) 6^{10} D) 36^{10}

Solution:

$2^3 \times 2^2 \times 3^3 \times 3^2 = 2^5 \times 3^5 = 6^5$

Answer: A

Q3: $5^3 + 5^2 - 5^1 = ?$

A) 20 B) 145 C) 150 D) 155

Solution:

$5^3 + 5^2 - 5^1 = 125 + 25 - 5 = 145$

Answer: B

Q4: $\frac{1001}{1000100} + \frac{10010}{1001} = ?$

A) 10.01 B) 10.1 C) 0.1 D) 1

Solution:

$\frac{1001}{1000100} + \frac{10010}{1001} = \frac{1}{100} + 10 = 0.01 + 10 = 10.01$

Answer: A

Q5: Find the value x if

$1+2+3+4+5+x = 21+22+23+24+25.$

A) 11 B) 210 C) 100 D) 20

Solution:

$1+2+3+4+5+x = 21+22+23+24+25$
$x = 21-1+22-22+23-3+24-4+25-5$
$x = 20+20+20+20+20$
$x = 100$

Answer: C

Q6: $\sqrt{\frac{1}{4}+\frac{4}{9}} = ?$

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

Solution:

$\sqrt{\frac{1}{4}+\frac{4}{9}} = \sqrt{\frac{9+16}{36}} = \sqrt{\frac{25}{36}} = \frac{5}{6}$
(9) (4)

Answer: D

Q7: Which of the following numbers is an even number?

A) $2007^3 + 4$ B) $2008^3 + 5$
C) $2009^3 + 6$ D) $2009^3 + 7$

Solution:

$2007^3 + 4$ odd number, $2008^3 + 5$ odd number
$2009^3 + 6$ odd number, $2009^3 + 7$ even number

Answer: D

Q8: According to the values of A and B which are given below, what is $\frac{A}{B}$?

$$A = 0.01 + 0.02 + 0.03 + ... + 0.99$$
$$B = 0.1 + 0.2 + 0.3 + ... + 9.9$$

A) $\frac{1}{10}$ B) $\frac{1}{100}$ C) 10 D) 100

Solution:

$10 \times A = 10 \times (0.01 + 0.02 + 0.03 + ... + 0.99)$

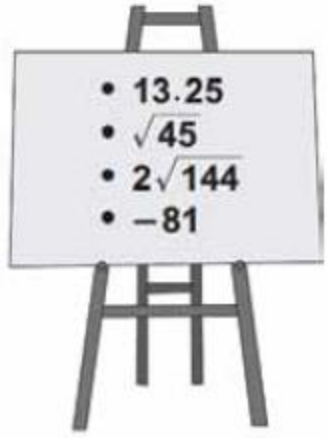
$10A = 0.1 + 0.2 + 0.3 + ... + 9.9 = B$

$10A = B$

$\frac{A}{B} = \frac{A}{10A} = \frac{1}{10}$

Answer: A

Q9: Which of the following number on the board should be removed in order to make all of them rational?



A) 13.25 B) $\sqrt{45}$ C) $2\sqrt{144}$ D) –81

Solution:

$2\sqrt{144} = 2(12) = 24$ rational number

$\sqrt{45} = 3\sqrt{5}$ irrational number

Answer: B

Q10: Which of the following is equal to $6\sqrt{2}$?

A) $\sqrt{6}$ B) $\sqrt{12}$ C) $\sqrt{24}$ D) $\sqrt{72}$

Solution:

$\sqrt{72} = \sqrt{36 \times 2} = \sqrt{36} \times \sqrt{2} = 6\sqrt{2}$

Answer: D

Q11: Find the value of x in the following equation $\frac{x}{2} - 1 = \frac{x}{3} + 2$.

A) 6 B) 12 C) 18 D) 21

Solution:

$\frac{x}{2} - \frac{x}{3} = 2 + 1, \quad \frac{3x - 2x}{6} = 3$

(3) (2)

$\frac{x}{6} = 3, x = 18$

Answer: C

Q12: $4 \times 3^3 - 3^2 + 5 = ?$

A) 104 B) 96 C) 81 D) 72

Solution: $4 \times 3^3 - 3^2 + 5 = 4 \times 27 - 9 + 5 = 108 - 4 = 104$

Answer: A

Q13: $\frac{\left(1-\frac{1}{2}\right)}{\left(1+\frac{1}{2}\right)} + \frac{\left(2-\frac{1}{2}\right)}{\left(2+\frac{1}{2}\right)} \times \frac{\left(3-\frac{1}{2}\right)}{\left(3+\frac{1}{2}\right)} \times \frac{\left(4-\frac{1}{2}\right)}{\left(4+\frac{1}{2}\right)} = ?$

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

Solution:

$\frac{\left(\frac{1}{2}\right)}{\left(\frac{3}{2}\right)} + \frac{\left(\frac{3}{2}\right)}{\left(\frac{5}{2}\right)} \times \frac{\left(\frac{5}{2}\right)}{\left(\frac{7}{2}\right)} \times \frac{\left(\frac{7}{2}\right)}{\left(\frac{9}{2}\right)} = \left(\frac{1}{2}\right) \times \left(\frac{2}{3}\right) + \frac{\left(\frac{3}{2}\right)}{\left(\frac{9}{2}\right)}$

$\frac{1}{3} + \frac{1}{3} = \frac{2}{3}$

Answer: A

Q14: The ratio of two numbers is $\frac{3}{5}$. What will be the new ratio if both numerator and denominator multiplied by the same number?

A) $\frac{3}{5}$ B) $\frac{5}{3}$

C) $\frac{9}{25}$ D) None of these

Solution: $\frac{3}{5}=\frac{3\times k}{5\times k}=\frac{3}{5}$

Answer: A

Q15: If $\frac{2x}{x^2+1}=\frac{2}{x+2}$, what is the value of x?

A) $\frac{1}{4}$ B) $-\frac{1}{4}$ C) $\frac{1}{2}$ D) 0

Solution:

$$\frac{2x}{x^2+1}=\frac{2}{x+2},$$

$$2x^2+4x=2x^2+2$$

$$4x=2,\ x=\frac{1}{2}$$

Answer: C

Q16: What will be the number at the center of the 6th row if the following pattern continues?

1 _____ 1st row

3 5 7 _____ 2nd row

9 11 13 15 17 _____ 3rd row

:

:

A) 41 B) 61 C) 71 D) 85

Solution:
51, 53, 55, 57, 59, 61, 63, 65, 67, 69, 71 the number at the center of the 6th row is 61

Answer: B

Q17: Simplify $\frac{8^4\times 4^2}{2^8}$

A) 2^{12} B) 2^8 C) 2^6 D) 2^4

Solution:

$$\frac{8^4\times 4^2}{2^8}=\frac{(2^3)^4\times(2^2)^2}{2^8}=\frac{2^{12}\times 2^4}{2^8}=\frac{2^{16}}{2^8}=2^8$$

Answer: B

Q18: What is the value of c if $a+b=12$, $ac+b=18$ and $bc+a=6$?

A) 7 B) 4 C) 2 D) 1

Solution:

$$ac+b=18$$
$$bc+a=6$$
$$ac+b+bc+a=18+6$$
$$ac+bc+b+a=24$$
$$c(a+b)+b+a=24$$
$$12c+12=24$$
$$12c=12$$
$$c=1$$

Answer: D

Q19: How does the area of a rectangle change if both the length and the width of the original rectangle are tripled?

A) The area is tripled.
B) The area is six times larger.
C) The area is nine times larger.
D) The area remains the same.

Solution:

$$Area \text{ of rectangle} = a\times b = ab$$
$$New \quad area \quad of \quad \text{rectangle} = 3a\times 3b = 9ab$$

Answer: C

Q20: The product of four different natural numbers is 360. What is the maximum value of the sum of these numbers?

A) 68 B) 66 C) 52 D) 39

Solution:

$1\times2\times3\times60=360$

$1+2+3+60=66$

Answer: B

Q21: Which of the following numbers is the smallest positive integer that it is added to 133 to get a perfect square number?

A) 1 B) 11 C) 21 D) 31

Solution:

$133+11=144=12^2$

Answer: B

Q22: Rs. 5500 was divided among three boys. The first boy got Rs. 400 less than the second boy and the second boy got Rs. 700 more than the third boy. How much money did the first boy get?

A) Rs. 1800 B) Rs. 1900
C) Rs. 2100 D) Rs. 2200

Solution:

The **first boy : x + 300**

The second boy : x + 700

The third boy:x

$x+300+x+700+x=5500$

$3x+1000=5500$

$3x=4500$

$x=1500$

The **first boy : x + 300 = 300 + 1500 = 1800**

Answer: A

Q23: Simplify $\frac{9x^2-15x}{6x-10}$.

A) $\frac{x-8}{6}$ B) $\frac{3x}{2}$ C) $3x-5$ D) $\frac{3}{2}$

Solution:

$$\frac{3x(3x-5)}{2(3x-5)}=\frac{3x}{2}$$

Answer: B

Q24: If 400 is increased by 20% and result is decreased by 20% then what is the new number?

A) 384 B) 382 C) 380 D) 372

Solution:

$$400\times\frac{120}{100}=480$$

$$480\times\frac{80}{100}=384$$

Answer: A

Q25: The average ages of 20 people in a camp is 36. This average became 37 when 5 more people joined them. The ages of four persons of those who joined the camp is 40 each. What is the age of the fifth person?

A) 37 b) 40 C) 42 D) 45

Solution:

total ages of 20 people in the camp:$20\times36=720$

total ages of $20+5$ people in the camp:$25\times37=925$

total ages of 5 people in the camp:925-720=205

total ages of 4 people in the camp:$4\times40=160$

the age of the fifth person : $205-160=45$

Answer: D

Q26: The ratio of the number of dogs and the number of cats in a zoo is $\frac{1}{4}$. Which of the following could be the total number of dogs and cats in the zoo?

A) 44 B) 80 C) 92 D) 108

Solution:

$\frac{1}{4} = \frac{1k}{4k}$

total number of dogs and cats in the zoo : $1k + 4k = 5k$

It shold be multiple of 5

Answer: B

Q27: a and b are two integers and $a^b = 16$.
What is the sum of all possible values of a *and* b?

A) 29 B) 31 C) 32 D) 33

Solution:

$a^b = 16 \Rightarrow 2^4 = 16, (-2)^4 = 16, 4^2 = 16,$

$(-4)^2 = 16, 16^1 = 16$

Sum of v*alues of* $a : 2 + (-2) + 4 + (-4) + 16 = 16$

Sum of v*alues of* b:4+4+2+2+1=13

16+13=29

Answer: A

Q28: In a bookcase, there are 17, 20, 24 and 27 math books in each shelf respectively. At least how many books should be interchanged in order to get equal number of math book in each shelf?

A) 6 B) 7 C) 8 D) 9

Solution:

$17 + 20 + 24 + 27 = 88$

$Avereage = \frac{88}{4} = 22$

$17 + (5) = 27 - (5) = 20 + (2) = 24 - (2)$

$(5) + (2) = 7$

Answer: B

Q29: The average of four numbers is 24. The average of the numbers without the greatest one is 20 and without the smallest one is 30.

What is the average of two numbers in middle?

A) 25 B) 26 C) 27 D) 28

Solution:

The sum of four numbers is=4×24=96

The sum of the numbers without the greatest one = 3×20 = 60

the greatest number:96-60=36

The sum of the numbers without the smallest one = 3×30 = 90

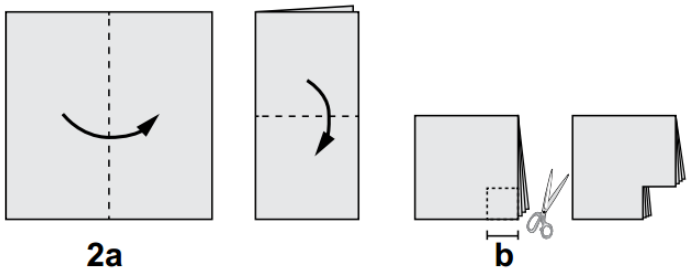
the smallest number:96-90=6

the sum of two numbers in middle=96-(36+6)=54

the average of two numbers in middle $= \frac{54}{2} = 27$

Answer: C

Q30: A paper in a square type with a side 2a units that is folded two times to obtain a new square. After getting this new square, a small square with a side b units is removed from its corner. What will be the area of the final figure when the paper is opened?



A) $a^2 - b^2$ B) $2a^2 - b^2$

C) $(2a - b)^2$ D) $4a^2 - 4b^2$

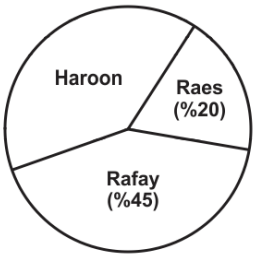
Solution:

Area of one face: $a^2 - b^2$

Area of four faces: $4(a^2 - b^2) = 4a^2 - 4b^2$

Answer: D

Q31: The pie chart below shows the percentage of the distribution of the votes for the election of the head boy of the school. What can be the possible votes of Haroon?



A) 550 B) 350 C) 330 D) 450

Solution:

the percentage of the votes for Haroon:

100%-20%-45%=35%=$\frac{35}{100}=\frac{7}{20}$

So it should be multiple of 7

Answer: B

Q32: $2+4+6+8+.....+30=?$

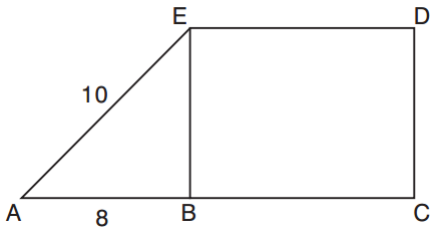
A) 230 B) 240 C) 250 D) 260

Solution:

$$2(1+2+3+4+.....+15)=2\times\frac{15\times(15+1)}{2}=240$$

Answer: B

Q33: In the following figure, BCDE is a square and ABE is a triangle. What is the length of AC if the perimeter of triangle and the square is equal?



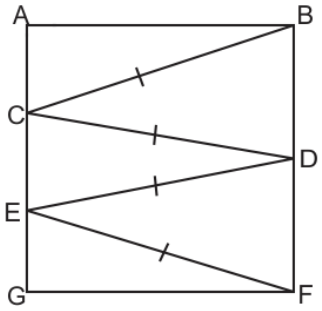
A) 12 B) 14 C) 15 D) 16

Solution:

$$EB=BC=\sqrt{10^2-8^2}=\sqrt{36}=6$$
$$AB=AB+BC=8+6+14$$

Answer: B

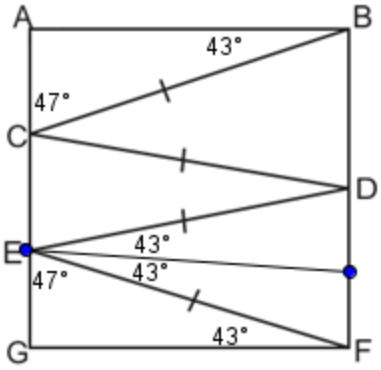
Q34: ABFG is a square, if $\angle ABC=x$ and $\angle ACB=x+4$ then what is $\angle GED$?



A) 43 B) 47 C) 86 D) 133

Solution:

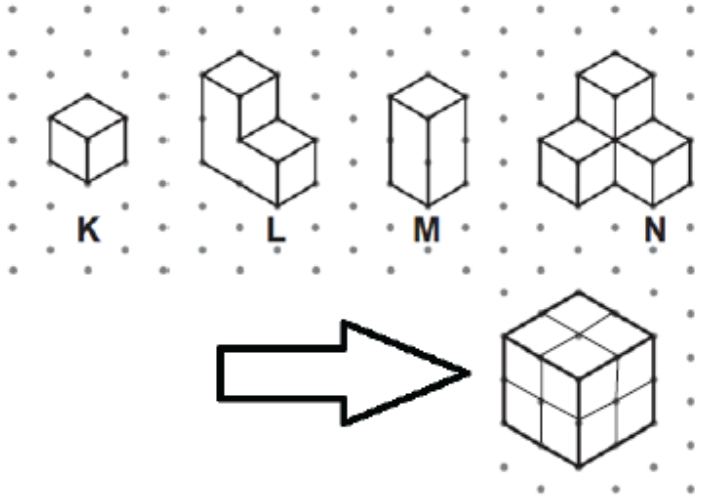
$$x+x+4+90°=180°$$
$$2x=86°$$
$$x=43°$$



$\angle GED=47°+43°+43°=133°$

Answer: D

Q35: Which parts should be joined in order to get the cube in the figure?

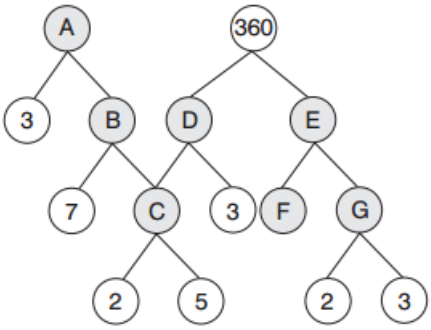


A) K, L, N
B) L, M, N
C) K, L, M
D) K, M, N

Solution: K, L, N

Answer: A

Q36: According to the following "multiplication tree", what is the value of $A+B-(C+D)+(E+F-G)$?



A) 236
B) 248
C) 258
D) 254

Solution:

$210+70-(10+30)+(12+2-6)$

$C=2\times5=10$

$B=7\times10=70$

$A=3\times70=210$

$D=10\times3=30$

$G=2\times3=6$

$30\times E=360,\ \text{E=12}$

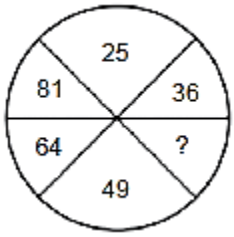
$\text{F}\times6=12,\ \text{F=2}$

$A+B-(C+D)+(E+F-G)=$

$210+70-(10+30)+(12+2-6)=248$

Answer: B

Q37: The numbers in the circle below are placed with a certain pattern.



Which number can replace the question mark?

A) 169
B) 144
C) 125
D) 121

Solution:

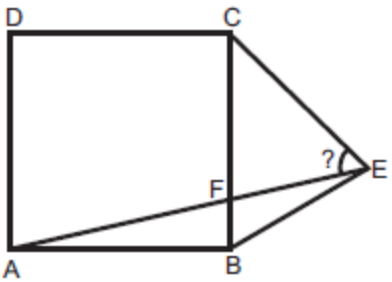
$25+49=64=8^2$

$64+36=100=10^2$

$81+144=225=15^2$

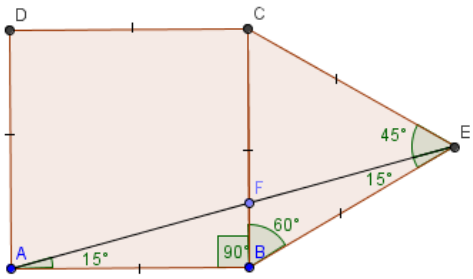
Answer: B

Q38: In the following figure, ABCD is a square and BEC is an equilateral triangle. What is $\angle AEC$?



A) 30°
B) 45°
C) 60°
D) 75°

Solution:



$\angle AEC = 45°$

Answer: B

Q39: The average of x , y and z is 23 and the average of x and z is 13.

What is the value of y?

A) 16 B) 18 C) 33 D) 43

Solution:

***Sum* of x,y and z: $23 \times 3 = 69$**

***Sum* of x and z: $13 \times 2 = 26$**

$x + z + y = 69 \Rightarrow 26 + y = 69 \Rightarrow y = 43$

Answer: D

Q40: A basketball team had a ratio of wins to losses of 3:1. When the team won next six matches, then the ratio of wins to losses became 5:1. How many matches had the team won before winning six matches?

A) 3 B) 6 C) 9 D) 15

Solution:

a ratio of wins to losses of $3:1 = 3k:1k$

$$\frac{3k+6}{k} = \frac{5}{1}$$

$5k = 3k + 6$

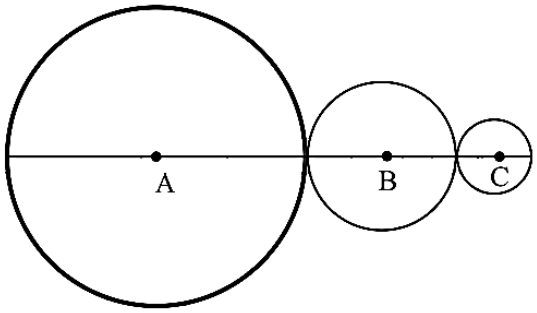
$2k = 6$

$k = 3$

$3k = 3(3) = 9$

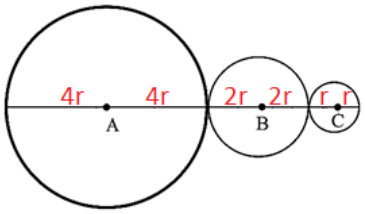
Answer: C

Q41: In the figure below, the radius of the circle with center A is twice the radius of the circle with center B and four times the radius of the circle with center C. If the sum of the areas of the three circles is 84π, what is the length of AC?



A) 18 B) 34 C) 36 D) 38

Solution:



the sum of the areas of the three circles:

$\pi(r)^2 + \pi(2r)^2 + \pi(4r)^2 = 84\pi$

$\pi r^2 + 4\pi r^2 + 16\pi r^2 = 84\pi$

$21\pi r^2 = 84\pi$

$r^2 = 4, r = 2$

$AC = 9r = 9(2) = 18$

Answer: A

Q42: When 23 is divided by 3, the remainder is x. What is the remainder when 23 is divided by $2x$?

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

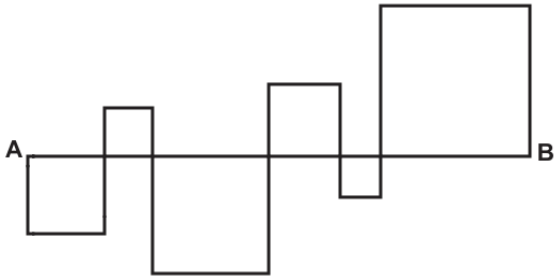
Solution:

$x = 2, 2x = 4$

when 23 is divided by 4, the remainder is 3

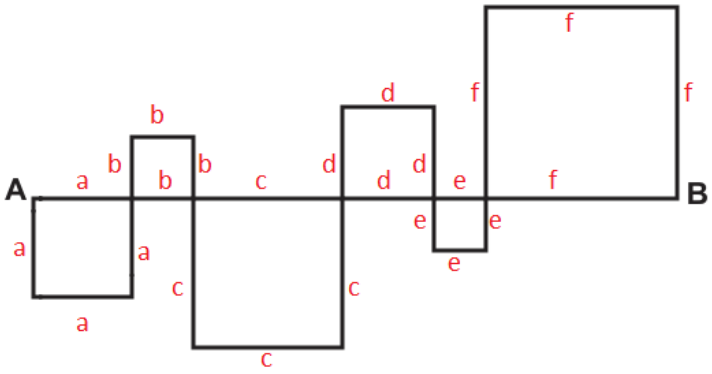
Answer: C

Q43: The figure below is formed by 6 different squares. What is the perimeter of the figure if the length of AB is 32 cm?



A) 48 cm B) 72 cm
C) 96 cm D) 128 cm

Solution:



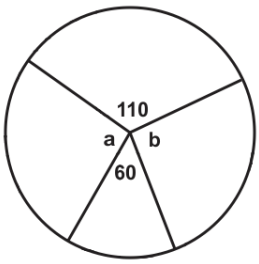
$a+b+c+d+e+f=32$

$4a+4b+4c+4d+4e+4f=$

$4(a+b+c+d+e+f)=4(32)=128$

Answer: D

Q44: What is sum of the measurement of the angles a and b?



A) 85 B) 110 C) 170 D) 190

Solution:

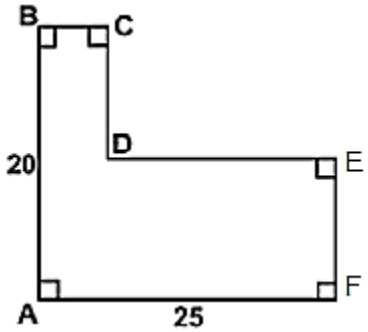
$a+b+60°+110°=360°$

$a+b+170°=360°$

$a+b=190°$

Answer: D

Q45: What is the perimeter of ABCDEF?



A) 75 B) 80 C) 85 D) 90

Solution:

$BC+DE=25$

$CD+EF=20$

the perimeter of ABCDEF:

$20+25+20+25=90$

Answer: D

Q46: Which of the following is correct if $a=1\frac{7}{8}$, $b=\frac{14}{9}$, $c=1\frac{3}{4}$?

A) a>b>c B) a>c>b C) b>c>a D) c>a>b

Solution:

$a=1\frac{7}{8}>c=1\frac{3}{4}>b=\frac{14}{9}=1\frac{5}{9}$

Answer: B

Q47: What is the total number of digits in the following operation?

$$8^3 \times 5^9$$

A) 999 B) 99 C) 10 D) 9

Solution:

$8^3 \times 5^9 = (2^3)^3 \times 5^9 = 2^9 \times 5^9 = (2 \times 5)^9 = 10^9$

$10^9 = 1000000000$

10 digits

Answer:C

Q48: Which of the following is the smallest for the value of $x = -3$?

A) $x^2 - 3$ B) $(x-3)^2$

C) x^2 D) $(x+3)^2$

Solution:

$x^2 - 3 = (-3)^2 - 3 = 6$

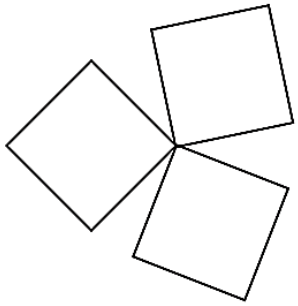
$(x-3)^2 = (-3-3)^2 = (-6)^2 = 36$

$x^2 = (-3)^2 = 9$

$(x+3)^2 = (-3+3)^2 = 0$

Answer: D

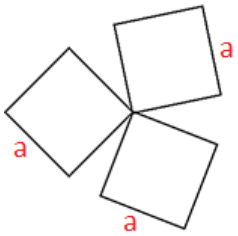
Q49: The shape below is formed by three congruent squares..



What is the area of the figure in cm^2 if its perimeter is 60 cm?

A) 25 B) 50 C) 75 D) 80

Solution:



$4a + 4a + 4a = 60$

$12a = 60$

$a = 5cm$

the area of the figure :

$a^2 + a^2 + a^2 = 3a^2 = 3(5)^2 = 3(25) = 75cm^2$

Answer: C

Q50: There are 832 rabbits in a zoo. The number of rabbits doubles every month. How many months ago there were only 52 rabbits in the zoo?

A) 3 B) 4 C) 5 D) 6

Solution:

$832 \div 2 = 416$(*one* month ago)

$416 \div 2 = 208$(*two* months ago)

$208 \div 2 = 104$(*three* months ago)

$104 \div 2 = 52$(*four* months ago)

Answer: B