Q1: $\frac{1}{2}-\frac{2}{4}+\frac{1}{6}-\frac{1}{6}\div 2-\frac{1}{4}=?$

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

Solution:

$$\frac{1}{2}-\frac{2}{4}+\frac{1}{6}-\frac{1}{6}\div 2-\frac{1}{4}=\frac{1}{2}-\frac{1}{2}+\frac{1}{6}-\frac{1}{6}\times\frac{1}{2}-\frac{1}{4}$$
$$\Rightarrow \frac{1}{6}-\frac{1}{12}-\frac{1}{4}=\frac{2-1-3}{12}=\frac{-2}{12}=-\frac{1}{6}$$

Answer: D

Q2: $\left[\left(\frac{0.025}{0.05}\right)\div\left(\frac{1}{2}-1\right)\right]=?$

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

Solution:

$$\left[\left(\frac{0.025}{0.05}\right)\div\left(\frac{1}{2}-1\right)\right]=\frac{25}{50}\div\left(-\frac{1}{2}\right)=\frac{1}{2}\div\left(-\frac{1}{2}\right)=-1$$

Answer: B

Q3: $\left(2+\frac{3}{8}\right)\div\left(\frac{2}{3}-\frac{1}{6}\right)=?$

A) $\frac{17}{4}$ B) $\frac{19}{4}$ C) $\frac{17}{8}$ D) $\frac{19}{8}$

Solution:

$$\left(2+\frac{3}{8}\right)\div\left(\frac{2}{3}-\frac{1}{6}\right)=\frac{19}{8}\div\frac{3}{6}=\frac{19}{8}\div\frac{6}{3}=\frac{19}{4}$$

Answer: D

Q4: If a is an odd number, which of the following is always an even number?

A) a^2+3 B) $4a-1$ C) $11a$ D) a^{2016}

Solution: Power of even number is an even number. Sum of two odd number is even number. So a^2+3 is always an even number.

Answer: A

Q5: $\frac{\sqrt{2.25}-\sqrt{1.96}}{\sqrt{0.09}-\sqrt{0.16}}=?$

A) 1 B) -1 C) 0.1 D) -0.1

Solution:

$$\frac{\sqrt{2.25}-\sqrt{1.96}}{\sqrt{0.09}-\sqrt{0.16}}=\frac{1.5-1.4}{0.3-0.4}=\frac{0.1}{-0.1}=-1$$

Answer: B

Q6: What is the remainder when the sum of three consecutive even integers is divided by 3?

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

Solution: the sum of three consecutive even integers is always divisible by 3. So remainder is 0.

$$\frac{n+n+2+n+4}{3}=\frac{3n+6}{3}=\frac{3(n+2)}{3}=n+2$$

Answer: A

Q7: $\left.\begin{matrix} x+y=12 \\ a-b=-7 \end{matrix}\right\} \Rightarrow -bx-by+ax+ay=?$

A) -84 B) 5 C) -19 D) -5

Solution:
$-bx-by+ax+ay=-b(x+y)+a(x+y)$
$(x+y)(a-b)=12\times(-7)=-84$

Answer: A

Q8: Find the value of x in the equation $x-2\{x-[x-2(x-2)]\}=14$.

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

Solution:
$x-2\{x-[x-2(x-2)]\}=14$
$\Rightarrow x-2\{x-[x-2x+4]\}=14$
$\Rightarrow x-2(x+x-4)=14 \Rightarrow -3x+8=14$
$\Rightarrow -3x=6 \Rightarrow x=-2$

Answer: C

Q9: If $\left.\begin{matrix} x+y+z=4 \\ xy+xz=4 \end{matrix}\right\}$,then $x=?$

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

Solution: $x+y+z=4 \Rightarrow y+z=4-x$

$xy+xz=4 \Rightarrow x(y+z)=4 \Rightarrow x(4-x)=4$
$\Rightarrow 4x-x^2=4 \Rightarrow x^2-4x+4=0 \Rightarrow (x-2)^2=0$
$\Rightarrow x=2$

Answer: C

Q10: What is x if $\frac{3}{x-12}=\frac{8}{2x+14}$?

A) 77 B) 73 C) 71 D) 69

Solution:
$\frac{3}{x-12}=\frac{8}{2x+14} \Rightarrow 8(x-12)=3(2x+14)$
$\Rightarrow 8x-96=6x+42 \Rightarrow 8x-6x=96+42$
$2x=138 \Rightarrow x=69$

Answer: D

Q11: $\frac{K}{L}=\frac{1}{7}$, $\frac{L}{M}=\frac{1}{4}$, $K+L+M=72 \Rightarrow L=?$

A) 2 B) 14 C) 21 D) 42

Solution:
$\frac{K}{L}=\frac{1}{7}$, $\frac{L}{M}=\frac{1}{4}$, $\frac{L}{7}+L+4L=72 \Rightarrow \frac{36L}{7}=72$
$\Rightarrow L=7\times 2=14$

Answer: B

Q12: How many of the following are correct?

i. 0 is a positive integer
ii. The greatest negative integer is -1
iii. 5 is a rational number
iv. 2 is a prime number
v. -2.5 is an integer

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

Solution:
ii. The greatest negative integer is -1
iii. 5 is a rational number
iv. 2 is a prime number

Answer: C

Q13: $\dfrac{\left(1+\frac{1}{2}\right)\times\left(1+\frac{1}{3}\right)\times\left(1+\frac{1}{4}\right)\times....\times\left(1+\frac{1}{12}\right)}{\left(1-\frac{1}{2}\right)\times\left(1-\frac{1}{3}\right)\times\left(1-\frac{1}{4}\right)\times....\times\left(1-\frac{1}{12}\right)}=?$

A) 78 B) $\frac{57}{11}$ C) $\frac{66}{11}$ D) $\frac{78}{11}$

Solution:

$$\frac{\left(1+\frac{1}{2}\right)\times\left(1+\frac{1}{3}\right)\times\left(1+\frac{1}{4}\right)\times....\times\left(1+\frac{1}{12}\right)}{\left(1-\frac{1}{2}\right)\times\left(1-\frac{1}{3}\right)\times\left(1-\frac{1}{4}\right)\times....\times\left(1-\frac{1}{12}\right)}=$$

$$\frac{\frac{3}{2}\times\frac{4}{3}\times\frac{5}{4}\times....\times\frac{13}{12}}{\frac{1}{2}\times\frac{2}{3}\times\frac{3}{4}\times....\times\frac{11}{12}}=\frac{\frac{13}{2}}{\frac{1}{12}}=\frac{13}{2}\times\frac{12}{1}=13\times6=78$$

Answer: A

Q14: Which of the following is correct if $\dfrac{x-\frac{1}{y}}{y-\frac{1}{x}}=4$?

A) x is $\frac{1}{4}$ times y B) y is $\frac{1}{4}$ times x

C) y is 4 times x D) x and y are equal

Solution:

$$\frac{x-\frac{1}{y}}{y-\frac{1}{x}}=4\Rightarrow\frac{\frac{xy-1}{y}}{\frac{xy-1}{x}}=4\Rightarrow\frac{xy-1}{y}\times\frac{x}{xy-1}=4$$

$$\Rightarrow\frac{x}{y}=4\Rightarrow x=4y\Rightarrow y=\frac{x}{4}$$

Answer: B

Q15: $\dfrac{1+2+3}{2}+\dfrac{4+5+6}{5}+.....+\dfrac{100+101+102}{101}=?$

A) 96 B) 99 C) 102 D) 105

Solution:

$$\frac{1+2+3}{2}+\frac{4+5+6}{5}+.....+\frac{100+101+102}{101}=$$

$$\Rightarrow\frac{6}{2}+\frac{15}{5}+.....+\frac{303}{101}=3+3+.....3=3\times\frac{102}{3}=102$$

Answer: C

Q16: If $\begin{matrix}a=3\\b=-2\end{matrix}$, then find the value $2a-b-(b-a)$

A) 13 B) 12 C) 11 D) 10

Solution:

$$2a-b-(b-a)=2\times3-(-2)-\left[(-2)-3\right]$$

$$\Rightarrow6+2+5=13$$

Answer: A

Q17: A tap can fill a tank in 12 minutes and another tap can fill t h e same tank in 24 minutes. How long will they take to fill the same tank together?

A) 6 B) 8 C) 10 D) 12

Solution:

$$\frac{1}{12}+\frac{1}{24}=\frac{1}{x}\Rightarrow\frac{3}{24}=\frac{1}{x}\Rightarrow x=\frac{24}{3}=8$$

Answer: B

Q18: $\dfrac{\left(2011+\frac{1}{2}\right)-\left(2009-\frac{1}{3}\right)}{\left(2007+\frac{1}{3}\right)-\left(2005-\frac{1}{2}\right)}=?$

A) $\frac{13}{11}$ B) $\frac{12}{11}$ C) $\frac{10}{11}$ D) 1

Solution:

$$\frac{\left(2011+\frac{1}{2}\right)-\left(2009-\frac{1}{3}\right)}{\left(2007+\frac{1}{3}\right)-\left(2005-\frac{1}{2}\right)}=\frac{2011+\frac{1}{2}-2009+\frac{1}{3}}{2007+\frac{1}{3}-2005-\frac{1}{2}}$$

$$\Rightarrow \frac{2+\frac{5}{6}}{2+\frac{5}{6}}=\frac{\frac{17}{6}}{\frac{17}{6}}=\frac{17}{6}\times\frac{6}{17}=1$$

Answer: D

Q19: If $x^2=4$ and $y^2=9$, what is the greatest possible value of $(x-y)^2$?

A) 9 B) 25 C) 16 D) 1

Solution: $x^2=4\Rightarrow x=\pm 2$ and $y^2=9\Rightarrow y=\pm 3$

$(x-y)^2=\left(2-(-3)\right)^2=5^2=25$

Answer: B

Q20: If $a+2b=8$ and a and b are positive integers. How many possible values of a are there?

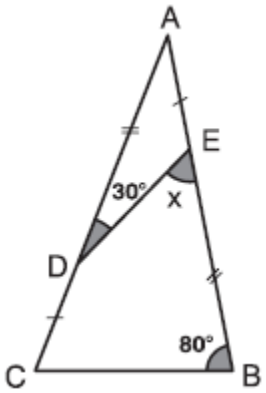
A) 1 B) 2 C) 3 D) 4

Solution:

When a=6 and b=1, a=4 and b=2 and a=2 and b=3

Answer: C

Q21: What is the value of x in the given triangle?



A) 40 B) 45 C) 50 D) 55

Solution: ABC is an isosceles triangle, AB=AC,

$x+80+80+150=360\Rightarrow x=360-310=50$

Answer: C

Q22: Which of the following expressions is one of the factors of $x^2+6y-xy-6x$?

A) $y+6$ B) $y-6$ C) $x+6$ D) $x-6$

Solution:

$x^2+6y-xy-6x=x(x-y)-6(x-y)=(x-y)(x-6)$

Answer: D

Q23: After the price of fuel went up by 10%, a man reduced his fuel consumption by 10%. What is the percentage change in his fuel bill?

A) decreased by 1% B) increased by 1%
C) decreased by 9% D) unchanged

Solution:

$Original=P\times F, New=\frac{110}{100}P\times\frac{90}{100}F=\frac{99}{100}P\times F$

Answer: A

Q24: If $x=193$ *and* $y=82$, what is the value of $\dfrac{(x+y)^2-4xy}{3x-3y}$?

A) 1 B) 37 C) 111 D) 333

Solution:

$$\frac{(x+y)^2-4xy}{3x-3y}=\frac{x^2+y^2+2xy-4xy}{3(x-y)}=\frac{x^2+y^2-2xy}{3(x-y)}$$

$$\Rightarrow \frac{(x-y)^2}{3(x-y)}=\frac{x-y}{3}=\frac{193-82}{3}=\frac{111}{3}=37$$

Answer: B

Q25: The radii of two circles are 7 and 14. What is the ratio of the circumference of first circle and the area of the second circle?

A) $\frac{1}{7}$ B) $\frac{1}{14}$ C) $\frac{1}{21}$ D) $\frac{1}{22}$

Solution:

$$\frac{\text{circumference of first circle}}{\text{area of the second circle}}=\frac{2\pi r}{\pi R^2}=\frac{2\times 7}{14^2}=\frac{14}{14^2}=\frac{1}{14}$$

Answer: B

Q26: The ratio of the number of female passengers in a bus is $\frac{3}{5}$. What is the total number of passengers if the number of male passengers is 8 less than the number of female passengers?
Which of the equation can be used to get the solution of the problem given above?

A) $\frac{3x}{5}=\frac{2x}{5}+8$ B) $\frac{3}{5}x-\frac{2}{5}=8$

C) $\frac{3x}{5}+\frac{2x}{5}=8$ D) $\frac{3}{5}=\frac{x}{2x-8}$

Solution: $\dfrac{\text{female passengers}}{\text{all passengers}}=\frac{3}{5}=\frac{x}{x+x-8}=\frac{x}{2x-8}$

Answer: D

Q27: Which of the following numbers cannot be the value of a if $\sqrt{0.ab}$ is a rational number where a and b are digits?

A) 5 B) 3 C) 2 D) 0

Solution: ab must be perfect square. So ab can be: 01, 04, 09, 16, 25, 36, 49, 64, 81. So a cannot be 5.

$$\sqrt{0.ab}=\sqrt{\frac{ab}{100}}=\frac{\sqrt{ab}}{10}$$

Answer: A

Q28: If $0<x<\frac{1}{2}$, which of the following has the least value?

A) x^2 B) x^3 C) x D) $1-x$

Solution: $0<x=\frac{1}{4}<\frac{1}{2}$

A) $x^2=\left(\frac{1}{4}\right)^2=\frac{1}{16}$ B) $x^3=\left(\frac{1}{4}\right)^3=\frac{1}{64}$

C) $x=\frac{1}{4}$ D) $1-x=1-\frac{1}{4}=\frac{3}{4}$

Answer: B

Q29: What is the intersection of two sets A and B if A is a set consisting the first 10 positive even numbers and B is a set consisting the first 10 positive odd numbers?

A) $\{1,2,3,4,5,6,7,8,9,10\}$ B) $\{1,3,5,7,9\}$

C) $\{2,4,6,8,10\}$ D) $\{\ \}$

Solution: They don't have common elements, they are disjoint sets. So their intersection is empty set.

Answer: D

Q30: $\dfrac{0.11+0.22+0.44+0.88}{0.33}=?$

A) 0.1 B) 0.5 C) 5 D) 0.8

Solution: $\dfrac{0.11+0.22+0.44+0.88}{0.33}=\dfrac{1.65}{0.33}=\dfrac{165}{33}=5$

Answer: C

Q31: The length of a certain rectangle is 4 times the width. If the area of the rectangle is 256, what is the length of the rectangle?

A) 4 B) 8 C) 16 D) 32

Solution:
area of the rectangle $=l\times b=4x\times x=4x^2=256$
$x^2=64\Rightarrow x=8\Rightarrow 4x=4\times 8=32$

Answer: D

Q32: If $\sqrt{x}+22=39$, what is the value of x ?

A) 64 B) 256 C) 289 D) 324

Solution: $\sqrt{x}+22=39\Rightarrow\sqrt{x}=17\Rightarrow x=17^2=289$

Answer: C

Q33: Which of the following could be cube of an integer?

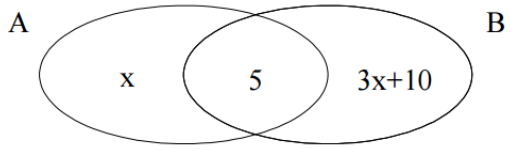
I. 1
II. 125
III. 343

A) I only B) II only
C) I and III D) I, II and III

Solution: $1^3=1,\quad 5^3=125\quad and\quad 7^3=343$

Answer: D

Q34: x , 5 and $3x+10$ represent the number of elements in $A-B$, $A\cap B$ and $B-A$ respectively in the Venn Diagram below.



What is the value of x if the number of elements in the set $A\cup B$ is 27?

A) 2 B) 3 C) 4 D) 5

Solution:
$n(A\cup B)=n(A-B)+n(B-A)+n(A\cap B)=27$
$x+5+3x+10=4x+15=27\Rightarrow 4x=12\Rightarrow x=3$

Answer: B

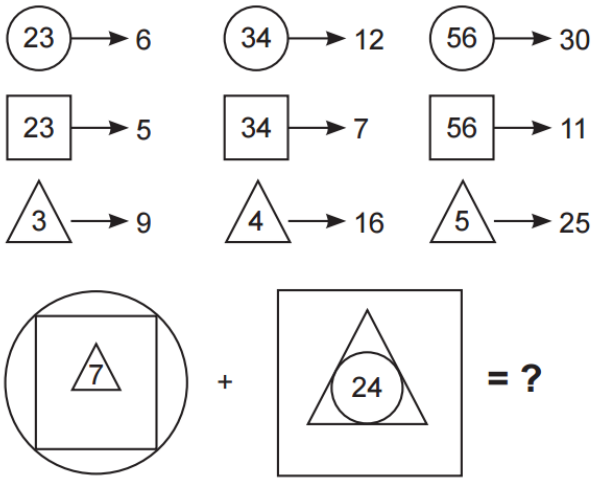
Q35: Faisal purchased 18 mouse pads for m rupees each. The total cost was Rs. 7200 more if he had purchased 14 mouse pads for m rupees each. What is the cost of one mouse pad?

A) Rs. 1200 B) Rs. 1400
C) Rs. 1600 D) Rs. 1800

Solution:
$18m-14m=7200\Rightarrow 4m=7200\Rightarrow m=Rs.1800$

Answer: D

Q36: What is the number indicated by question mark in the below number patterns?



A) 13 B) 11 C) 9 D) 7

Solution: According number pattern:
Circle stands for Multiplication,
Square stands for addition and
Triangle stands for square.

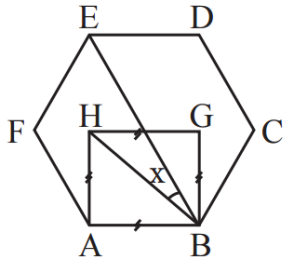
$7^2 = 49 \Rightarrow 4+9=13 \Rightarrow 1\times 3=3$

$2\times 4=8 \Rightarrow 8^2=64 \Rightarrow 6+4=10$

$3+10=13$

Answer: A

Q37: ABGH is a square and ABCDEF is a regular hexagon. What is the measure of $\angle HBE$ which is indicated by x?



A) 15 B) 22 C) 25 D) 30

Solution: $x = 60-45=15$

Answer: A

Q38: What will be replaced in the question mark?

$1\odot 3=2$

$3\odot 5=12$

$5\odot 7=30$

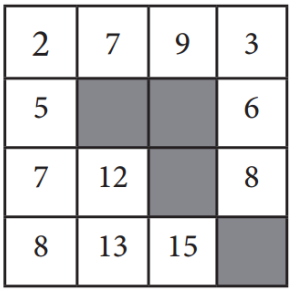
$6\odot 9=?$

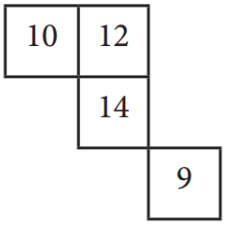
A) 54 B) 52 C) 48 D) 44

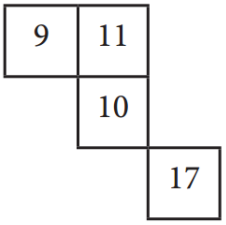
Solution: $6\odot 9=6\times 9-6=54-6=48$

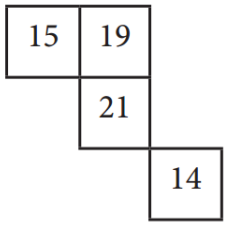
Answer: C

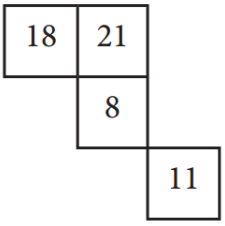
Q39: Which of the following is the shaded part of the square if numbers are arranged in a certain rule?



A)


B)


C)


D)


Solution: Left to right +5 then +2 then -6 operations are done for each rows.

Answer: A

Q40: What will be the product of next two integers in the number pattern given below?

12, 11, 9, 6, 2, ...

A) -27 B) -3 C) 12 D) 27

Solution: numbers are added -1, -2, -3, -4 then 2-5=-3 next number -3-6=-9 then their product is (-3)x(-9)=27.

Answer: D

Q41: In a school, 60% of the students are girls and 40% of the students like Maths. If 20 new boys join the school and all of them like Maths then the percentage of girls becomes 58%. Now what is the number of students who like Maths?

A) 232 B) 252 C) 318 D) 348

Solution:

$$\frac{\frac{60}{100}x}{x+20}=\frac{58}{100}\Rightarrow\frac{60x}{x+20}=58\Rightarrow x=580$$

$$\Rightarrow 580\times\frac{40}{100}+20=232+20=252$$

Answer: B

Q42: If a rectangular swimming pool has a volume of 16500 cm^3, a uniform depth of 10 cm and a length of 75 cm, what is the width of the pool, in cm?

A) 22 B) 26 C) 32 D) 110

Solution:

$$Volume = lentgh\times width\times heigth = 16500$$

$$width=\frac{16500}{10\times 75}=\frac{16500}{750}=22$$

Answer: A

Q43: Six cups of flour are required to make a pack of cookies. How many cups of flour are required to make enough cookies to fill 12 cookies jars, if each cookie jar holds 1.5 packs?

A) 108 B) 90 C) 81 D) 78

Solution: $6\times 1.5\times 12=9\times 12=108$

Answer: A

Q44: Computer production in a factory occurs in two shifts as shown in the chart below. If computers are produced only during the morning and afternoon shifts, in which of the following pairs of days is the greatest total number of computer produced?

Computer Production		
Day	Morning Shift	Afternoon Shift
Monday	200	378
Tuesday	245	330
Wednesday	255	340
Thursday	250	315
Friday	225	360

A) Monday and Wednesday
B) Tuesday and Thursday
C) Wednesday and Friday
D) Tuesday and Friday

Solution:
Wednesday and Friday = (255+340)+(225+360)=1180

Answer: C

Q45: What is A+B+C if the numbers in the table arranged according to a certain rule?

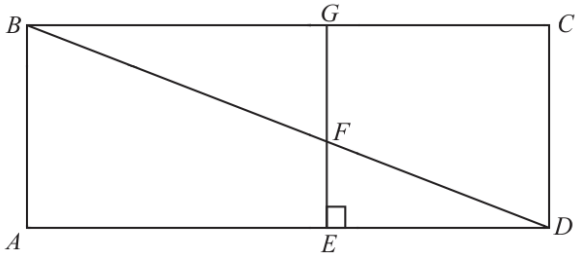
2	3	6
7	8	16
17	18	36
A	B	C

A) 131 B) 132 C) 133 D) 141

Solution: For each column see the rules then A=17+15=32, B=18+15=33 and C=36+30=66. A+B+C+=32+33+66=131

Answer: A

Q46: In the figure below, the area of rectangle $ABCD$ is 120. If $\overline{AD} \perp \overline{EG}$, $CD = 6$ and $AE = 12$, what is the length of $\overline{ED}$?



A) 6 B) 8 C) 9 D) 10

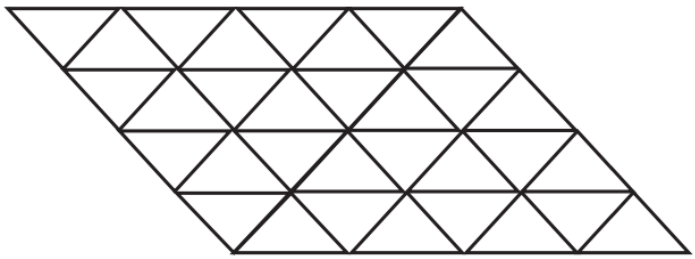
Solution:

area of rectangle $= AD \times CD = AD \times 6 = 120$

$\Rightarrow AD = 20 \Rightarrow ED = AD - AE = 20 - 12 = 8$

Answer: B

Q47: How many triangles are there in the following figure?



A) 32 B) 52 C) 54 D) 56

Solution: Count all types of triangles

Answer: D

Q48: If y is directly proportional to the square of x, then which of the following tables could represent values of x and y?

A)

x	y
2	4
3	6
4	8

B)

x	y
1	2
4	8
9	18

C)

x	y
2	3
4	9
16	27

D)

x	y
1	1
2	4
3	9

Solution: $y = kx^2 \Rightarrow 1 = k \times 1^2 \Rightarrow k = 1 \Rightarrow y = x^2$

Answer: D

Q49: Mustafa rides his motorbike with the speed of 30 km/hrs. in sunny weather and 20 km/hrs. in rainy weather. He rode his motorbike in the morning sunny weather and in the afternoon rainy weather today. It took 40 minutes to cover 16 km distance. How much time did he take to ride in rainy weather?

A) 16 min B) 20 min C) 24 min D) 28 min

Solution:

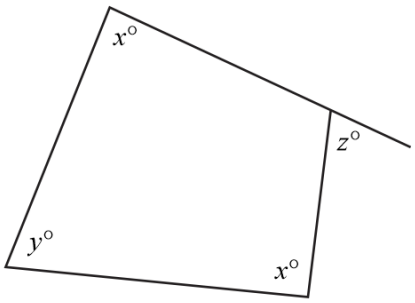
$$30\times t+20\times\left(\frac{40}{60}-t\right)=16\Rightarrow 30t+\frac{40}{3}-20t=16$$

$$10t=16-\frac{40}{3}=\frac{8}{3}\Rightarrow t=\frac{8}{30}=\frac{4}{15}\Rightarrow$$

$$\text{time in rainy weather}=\left(\frac{40}{60}-t\right)60=\left(\frac{40}{60}-\frac{4}{15}\right)60=24$$

Answer: C

Q50: In quadrilateral below, if $x=85$ and $y=72$, what is the value of z?



A) 58 B) 62 C) 64 D) 118

Solution:

$$x+x+y+180-z=360$$

$$\Rightarrow 85+85+72+180-360=z=62$$

Answer: B