8E-1

MAHAEXAM®
5th & 8th Scholarships
Truely in DEEPER sense
Concept by Harish Butle

Question Booklet Serial No.

MAHAEXAM®

PRE SECONDARY SCHOLARSHIP MOCK EXAMINATION - 2020

Medium : English

Subject : First Language - Mathematics

Date : 19/01/2020 Time : 1.30 Hr. Std. : 8th Total Marks : 150

Instructions :

(1) This question paper will be of 75 questions carrying 2 marks each.

(2) All questions are compulsory.

(3) Each question will have Four alternatives. ①②③④

(4) The answer sheet provided separately along with the question paper will have 4 circles ①②③④. Darken the correct alternative circle completely either with black or blue ink ballpen.
For example, if the answer for a question is 2, the circle having 2 should be completely made black or blue like this ①●③④

(5) Any of the answer coloured or marked as follows will get zero mark.
① ② ● ⊗

(6) Answers marked in pencil will not be considered.

(7) Answer once given cannot be changed.

(8) Answers marked in more than one circle will not be considered.

(9) Time limit of the examination is fixed. So if you do not know the answer to any of the questions, go to the next one. If time remains after attempting the final question attempt the questions left out.

Subject : First Language & Mathematics
Time : 11.00 am to 12.30 pm
SOLUTION

Question Paper

PART - I : FIRST LANGUAGE

Q.1 Which of the following two words are adjectives? (Select two options)

1) Valuable 2) Respect 3) Define **4) Divisional**

Ans. : (1) Valuable (4) Divisional

Q.2 Write word using the clues:

Wimbeldon Trophy: Tennis ::Walkers Cup :_____

1) Hockey 2) Polo **3) Golf** 4) Wrestling

Ans. : (3) Golf

Q.3 Choose two correct options meaning of the given word. (Select two options)

Judicial

1) related to court system 2) related to young people

3) related to happiness **4) related to judgeship**

Ans. : (1) related to court system (4) related to judgeship

Q.4 Identify the type of Adverb Clause.

He behaves as one might expect him to do.

1) Adverb clause of manner 2) Adverb clause of time

3) Adverb clause of reason 4) Adverb clause of place

Ans. : (1) Adverb clause of manner

Q.5 Pick out the method by which the two simple sentences are combined.

He was betrayed by his partner. He suffered huge loss.

Betrayed by his partner he suffered a huge loss.

1) infinitive **2) participle** 3) noun phrase 4) using adverb

Ans. : (2) participle

Q.6 Choose two correct sentences showing past perfect tense. (Select two options)

1) She has been writing a letter.

2) I will be helping Mary in studies.

3) The students had cleaned the classroom.

4) We hadn't prepared at all for the test.

Ans. : (3) The students had cleaned the classroom.

(4) We hadn't prepared at all for the test.

Q.7 Choose the sentence which shows polite request.

1) Could I have this letter typed? **2) Can you type this letter?**

3) You must type this letter. 4) You ought to type this letter.

Ans. : (2) Can you type this letter?

Q.8 What is green and white when it is throw up and red when it hits the ground?

1) gauva **2) water melon** 3) Gourd 4) Pumpkin

Ans. : (2) water melon

Q.9 Which of the following two sentences are in active voice? (Select two options)

1) I am reading a book written by Daniel Detoe.

2) The old lady is looked after by her son.

3) I saw two bright eyes looking at me.

4) The thief has been arrested by the police.

Ans. : (1) I am reading a book written by Daniel Detoe.

(3) I saw two bright eyes looking at me.

Q.10 Choose the correct indirect speech:

He said, "My father is writing book now."

1) He said his father was writing book now.

2) He said his father was wrote book now.

3) He said that his father was writing book then.

4) He said that father was writing book then.

Ans. : (3) He said that his father was writing book then.

Q.11 Choose the correct Wh-word for the following:

_____ much sugar do you take?

1) What **2) How** 3) Who 4) When

Ans. : (2) How

Q.12 Choose the correct alternative for Assertive sentence to Exclamatory Sentence:

It is foolish of him to jump from that wall .

1) What a fool he is to jump from that wall! **2) How foolish of him to jump from that wall!**

3) If only he jumped from that wall! 4) It is foolish of him to jump from the wall!

Ans. : (2) How foolish of him to jump from that wall!

Q.13 to Q.15 : Read the following poem and answer the questions given below.

Once there were two magnificient towers,
Where lived and worked so many of ours.
It took seven long years to build them straight
They stood near the empire state
This event happened on eleventh of September,
It's an occurrence that generations will remember.
Because thousands of people have died.
Not only of US, but the world's pride.
Everyone one saw with awe and fright,
Twin towers crashed in broad daylight.
None quite knows what will happen now,

When? Where? And how?
May God give wisdom to those,
who are devils in gentleman's pose.
Now let us remove hatred and vice,
And let the world be happy and nice

Q.13 What is the poem about?

1) a day in the month of September
2) a tragedy that occurred on 11th September
3) the importance of number eleven
4) the wonderful events of the month of September.

Ans. : (2) a tragedy that occurred on 11th September

Q.14 The pronoun 'them' in the third line refers to_____

1) people
2) Empire state building
3) towers
4) Seven years

Ans. : (3) towers

Q.15 The expression ' Who are devils in gentleman's pose' can be replaced by_____

1) dogs which looks like cats
2) snakes in the grass
3) horses with zebra stripes
4) wolves in lamb's clothing

Ans. : (4) wolves in lamb's clothing

Q.16 to Q.18 : Read the following passage and answer the questions given below.

Man does not live by food alone. Water is vital to human health and fitness. It, in fact, is a key nutrient in as much as no life is possible without it. Whereas we can do for weeks without food, we cannot live without water longer than a couple of days. Water approximates 60 per cent of the body weight of human adults. The total amount of water in a man weighing 70 kilograms is approximately a little over 40 liters. It is an excellent solvent – more substances are soluble in water than in any other liquid known so far. This makes it an ideal constituent of the body fluids which sustain life supporting chemical reactions. It dissolves varied products of digestion and transports them to the rest of the body. Likewise, it dissolves diverse metabolic wastes and helps drain them out of the body. Besides, it performs a variety of functions some well known and well understood while others not so well appreciated yet vital. Even excess of water is harmless. Water therapy drinking a liter or so the first thing in the morning is kidney-friendly. The water regulation in the body is affected by hypothalamus in two ways i.e.,(i) by creating the sensation of thirst which makes us drink water and (ii) by controlling the excretion of water and urine. If water regulation fails, medical emergency ensues.

Q.16 Man cannot live for more than a couple of days ____

1) Without food **2) without water** 3) without oxygen 4) without fruits

Ans. : (2) without water

Q.17 Water is an excellent solvent because _____

1) It regulates excretion of urine
2) It dissolves metabolic wastes
3) It drains wastes out of body
4) More substances are soluble in it than in any other liquid.

Ans. : (4) More substances are soluble in it than in any other liquid.

Q.18 Drinking a litre of water in the morning is called _____

1) Hypothalamus 2) Water regulation 3) Kidney therapy **4) Water therapy**

Ans. : (4) Water therapy

Q.19 Choose the correct English meaning for the given word.

bizarre

1) very strange 2) very interesting 3) very complicated 4) very easy

Ans. : (1) very strange

Q.20 When my friend went to her class she messaged,CUL8R, What did it mean?

1) see you latter 2) check your letter 3) send you a letter **4) see you later**

Ans. : (4) see you later

Q.21 Select a suitable ending for the letter written by an ordinary citizen to an editor of newspaper

1) Yours truly 2) Yours sincerely 3) Yours lovingly 4) Yours obediently

Ans. : (1) Yours truly

Q.22 Complete the slogan:

Love all, Trust a few,Do wrong ,_____

1) To none 2) To all 3) To a few 4) To you

Ans. : (1) To none

Q.23 to Q.25 : Read the following report writing and answer the questions given below.

Nov. 17 : A Science exhibition was held on Azad Maidan grounds on 16th November from 10a.m. to 6p.m.It was a dazzling event with many stalls and pandals . The theme of exhibition was 'India: Progress over last twenty years' . There were stalls on the progress made in India in field of Agriculture, industry, Defence, Space Technology and e-learning . Our class (Std. VIII B) spent an entire day at the exhibition. We were amazed by the display of models, charts, graphics, CDs and videos. Everything was explained to us very systematically and comprehensively. There were also snack stalls where items of food could be had at reasonable prices. The exhibition was indeed an eye-opener for all of us.

Q.23 Which of the following stall was not included?

1) Agriculture 2) Technology 3) Defence **4) Fashion**

Ans. : (4) Fashion

Q.24 What does eye- opener means?

1) to open eyes 2) surprises you

3) surprises and teaches new facts about 4) images and designs

Ans. : (3) surprises and teaches new facts about

Q.25 What was the theme of the exhibition?

1) India-Social 2) India- physical **3) India-progress** 4) India-political

Ans. : (3) India-progress

PART - II : MATHEMATICS

Q.26 If x is a positive real number and $x^2 = 2$, then $x^3 = ?$ (Select two options)

1) $\sqrt{18}$ **2)** $2\sqrt{2}$ 3) $3\sqrt{2}$ **4)** $\sqrt{8}$

Ans. : (2) $2\sqrt{2}$ **4)** $\sqrt{8}$

Solution : $x^2 = 2$

$\therefore x = \sqrt{2}$

$\therefore x^3 = (\sqrt{2})^3$

$= \sqrt{8}$

$= 2\sqrt{2}$

Q.27 If $a + b + c = 12$ and $a^2 + b^2 + c^2 = 64$ find the value of $ab + bc + ac = ?$

1) 144 2) 10 3) 80 **4) 40**

Ans. : (4) 40

Solution : $(a + b + c)^2 = a^2 + b^2 + c^2 = 2(ab + bc + ac)$

$12^2 = 64 + 2(ab + bc + ac)$

$144 - 64 = 2(ab + bc + ac)$

$\therefore 80 = 2(ab + bc + ac)$

$\therefore ab + bc + ac = \frac{80}{2} = 40$

Q.28 An iron box is sold at a gain of 16%. If it were sold for Rs.20/- more, there would have been a gain of 20%. Find the cost price of iron box.

1) Rs.420/- 2) Rs.580/- 3) Rs.480/- **4) Rs.500/-**

Ans. : (4) Rs.500/-

Solution : $S P = \frac{\text{Extra Amount} \times 100}{\text{Diff in profit (gain)}}$

$= \frac{20 \times 100}{(20 - 16)}$

$= \frac{\overset{5}{\cancel{20}} \times 100}{\cancel{4}}$

$= \text{Rs.}500/-$

Q.29 Which of the following rational number is between (-4) and (-5) ? (Select two options)

1) $-\frac{13}{3}$ 2) $-\frac{27}{3}$ **3)** $-\frac{17}{4}$ 4) $-\frac{18}{5}$

Ans. : (1) $-\frac{13}{3}$ **(3)** $-\frac{17}{4}$

Solution : $\frac{-4+(-5)}{2}=\frac{-9}{2}, -4+\left(\frac{-9}{2}\right)\div 2=\frac{-8-9}{2}\times\frac{1}{2}=\left(\frac{-17}{4}\right)$

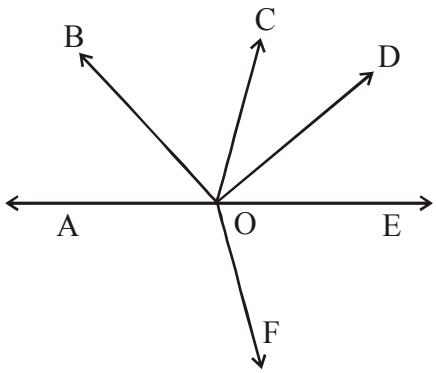
$\frac{-4\times 9}{9}=\frac{-36}{9}$; $\frac{-5\times 9}{9}=\frac{-45}{9}$

Nos. between $\frac{-36}{9}$ and $\frac{-45}{9}$

$=\frac{-36}{9},\frac{-37}{9},\frac{-38}{9},\frac{-39}{9},\ldots\ldots\ldots,\frac{-45}{9}$

$\frac{-39}{9}=\frac{-13}{3}$

Q.30 Observe the figure and find out incorrect alternatives. (Select two options)



1) Ray AO and Ray OE are opposite rays 2) Ray OB and Ray OD are not opposite rays
3) Line AE is a part of ray AE 4) O is origin of all rays

Ans. : (1) Ray AO and Ray OE are opposite rays
(3) Line AE is a part of ray AE

Q.31 If raining started on sunday at 10.30 a.m. and ended on Monday at 3.25 p.m.. Then how long was it raining ?

1) 4 hr 25 min 2) 7 hr 05 min 3) 13 hr 55 min **4) 28 hr 55min**

Ans. : (4) 28 hr 55min

Solution :

Sunday	10.30 am	Monday 10.30 am	= 24 hrs
Monday	10.30 am	Monday 02.30 pm	= 4 hrs
	2.30 pm	3.25 pm	= 55 min
		Total	= 28.55

Q.32 11, 10, 9, 11, 9, 11, 12, 11, 9, 8, 7, 9, 11, 10, 11.
In this data what is the ratio of frequency of 9 to frequency of 11 ?

(a) 4 : 6 (b) 6 : 4 (c) 2 : 3 (d) 3 : 2

1) a, b 2) b, c **3) a, c** 4) b, d

Ans. : (3) a, c

Solution : frequency of 9 = 4
frequancy of 11 = 6
$\therefore$ Ratio = 4 : 6
= 2 : 3

Q.33 By selling 35 greeting cards a shopkeeper loses an amount equal to the selling price of five greeting cards. Find the loss percent. (Choose two options)

1) $12\frac{1}{2}$ % 2) $12\frac{1}{4}$% **3) $\frac{50}{4}$ %** 4) $\frac{25}{4}$%

Ans. : (1) $12\frac{1}{2}$ % (3) $\frac{50}{4}$ %

Solution : Let the S P = Rs.1/-
$\therefore$ SP of 35 cards = Rs.35/-
Loss = SP of 5 cards
= 1 $\times$ 5 = Rs.5/-
$\therefore$ CP of 35 cards = SP + LOSS
= 35 + 5
= Rs.40/-

$\therefore$ Loss % = $\frac{\text{Loss}}{\text{CP}} \times 100$

$= \frac{5}{40} \times 100 = \frac{50}{4} = \frac{25}{4} = 12\frac{1}{2}\%$

Q.34 A circle has a diameter of 14cm. If a tree is planted on 4cm around the circumference of that circle, how many trees can be planted ?

1) 10 **2) 11** 3) 12 4) 7

Ans. : (2) 11

Solution : C = $2\pi r$

$= 2 \times \frac{22}{7} \times 7$

= 44

A tree on 4cm around the circumference of 44cm

$\therefore$ Trees = $\frac{44}{4}$ = 11 trees

Q.35 Observe the given multiples of 37

$37 \times 3 = 111$

$37 \times 6 = 222$

$37 \times 9 = 333$

$37 \times 12 = 444$

and so on. Find the product of $37 \times 27 = ?$ (Select two options)

1) 999 **2) greatest 3-digit number**

3) smallest 3-digit number 4) smallest 4-digit number

Ans. : (1) 999

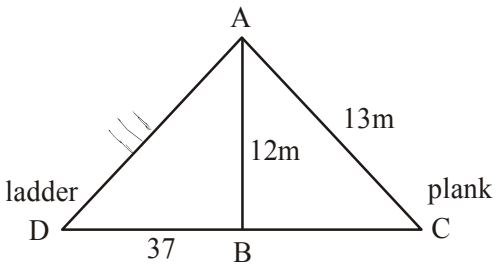
(2) greatest 3-digit number

Q.36 The height of an inclined plank of a slide and the ladder attached to it in a garden is 12 metres. The length of the plank is 13 metres and that of the ladder is 37 metres. Find the distance between their edges on the ground.

1) 40 m 2) 42 m 3) 21 m 4) 48 m

Ans. : (1) 40 m

Solution :



In $\triangle ABC$. By pythagorean theosen

$AC^2 = AB^2 + BC^2$

$\therefore$ Pythagorean triplet

$5 + 12 + 13$ $\therefore$ BC = 5m

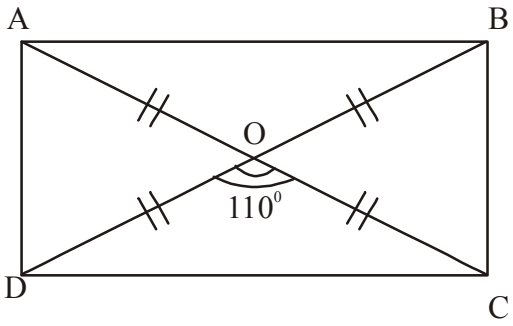
In $\triangle ABD$

Pythagorean triplet

$12 - 35 - 37$ $\therefore$ BD = 35

$\therefore$ CD = 35 + 5 = 40 m

Q.37 In the given figure ABCD, diagonal AC and BD bisects each other at point O.
If $m\angle DOC = 110^0$, $m\angle ADB = ?$



1) 110^0 **2) 55^0** 3) 45^0 4) 70^0

Ans. : (2) 55^0

Solution : $m\angle DOC = 110^0$

$m\angle AOD + m\angle DOC = 180^0$

$\therefore\ m\angle AOD = 180 - 110 = 70^0$

$\triangle AOD$ $AO = DO$

$\therefore\ \angle OAD = \angle ODA$

$\therefore\ m\angle AOD + m\angle ODA + m\angle OAD = 180^0$

$70 + x + x = 180^0$

$\therefore\ 2x = 180 - 70$

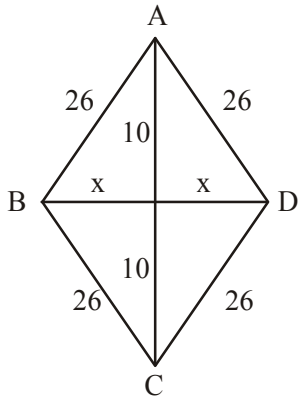
$$x = \frac{110}{2}$$

$= 55^0$

Q.38 The side of a rhombus is 26m and length of one of its diagonal is 20m. What is the area of the rhombus?
1) $120\ m^2$ 2) $240\ m^2$ **3) $480\ m^2$** 4) None of these

Ans. : (3) $480\ m^2$

Solution :



In $\triangle AOB$

By pythagorous them,

$AB^2 = OB^2 + OA^2$

$26^2 = x^2 + 10^2$

$\therefore\ 676 = x^2 + 100$

$x^2 = 676 - 100$

$= 576$

$\therefore\ x = 24$

Area of Rhombus $= \frac{1}{2} \times d_1 \times d_2$

$= \frac{1}{\cancel{2}} \times \overset{10}{\cancel{20}} \times 48$

$= 480\ m^2$

Q.39 The dimensions of an oil tin are 26cm × 26cm × 45cm. Find the area of tin sheet required to make 20 such tins.

1) 120640 cm² 2) 12640 cm² 3) 60320 cm² 4) 120640 cm³

Ans. : (1) 120640 cm²

Solution : Total surface area of tin $= 2(lb + bh + lh)$

$= 2(26 \times 26 + 26 \times 45 + 26 \times 45)$

$= 6032\ cm^2$

$\therefore$ To make 20 such tins area $= 6032 \times 20$

$= 120640\ cm^2$

Q.40 If $\sqrt{1+\frac{x}{225}} = \frac{16}{15}$ then x = ?

1) 15 2) 25 **3) 31** 4) None of these

Ans. : (3) 31

Solution : $\sqrt{1+\frac{x}{225}} = \frac{16}{15}$

$\therefore\ \sqrt{\frac{225+x}{225}} = \frac{16}{15}$

Taking square on both the sides.

$\frac{225+x}{225} = \frac{256}{225}$

$\therefore\ 225 + x = 256$

$\therefore\ x = 256 - 225$

$\therefore\ x = 31$

Q.41 If a number is reduced by 37.5%, the answer is 85. Then what is that number ?

1) 153 2) 119 **3) 136** 4) 170

Ans. : (3) 136

Solution : Let the number be x

$$\therefore x - x \times \frac{37.5}{100} = 85$$

$$\therefore \frac{100x - 37.5x}{100} = 85$$

$$\therefore 62.5x = 85 \times 100$$

$$x = \frac{85 \times 100}{62.5}$$

$$= \frac{85 \times 1000}{625}$$

$$= 136$$

Q.42 The mean of 9 scores is 33. If one score is deleted then the mean of remaining score is less by 2. Then what is the deleted score ?

1) 18 **2) 49** 3) 35 4) None of these

Ans. : (2) 49

Solution : $9 \times 33 = 297$

$8 \times 31 = 248$

$\therefore 297 - 248 = 49$

Q.43 How many litres of water can be stored in a water tank having dimensions of length 3 decimetre, breadth 3 decimetre and height of 20 cm ?

1) 180 litres 2) 12 litres 3) 26 litres **4) 18 litres**

Ans. : (4) 18 litres

Solution : 3 dm = 30 cm

volume of a cuboid = $l \times b \times h$

$= 30 \times 30 \times 20$

$= 18000 \text{ cm}^3$

$1 \text{ } l = 1000 \text{ cm}^3$

$$\therefore \frac{18000 \text{cm}^3}{1000} = 18 \text{ } l$$

Q.44 The ratio of angles of a triangle is 1 : 1 : 2. Then what type of triangle is it ?

1) right angled triangle 2) equilateral triangle

3) Isosceles right angled triangle 4) Isosceles triangle

Ans. : (3) Isosceles right angled triangle

Solution : Let the angle be x

$\therefore$ x + x + 2x = 180

4x = 180

x = 45

$\therefore$ measueres of angles of a $\triangle$ = 1 : 1 : 2

= 45, 45, 90

Q.45 Find the length of side of a square ground which is fenced by a wire of length 40.8 m.

1) 20.4 m 2) 123.2 m **3) 10.2 m** 4) 40.8 m

Ans. : (3) 10.2 m

Solution : Perimeter = fencing of a figure

$\therefore$ Perimeter of a square = 40.8

perimeter = 4 $\times$ side

$\therefore$ 40.8 = 4 side

$\therefore$ side $= \frac{40.8}{4} = 10.2$

Q.46 Mahesh borrowed Rs.5400/- from a bank at 10 paise for 10 rupees per month. How much interest did he have to pay in one year ?

1) Rs.648/- 2) Rs.540/- 3) Rs.448/- 4) Rs.558/-

Ans. : (1) Rs.648/-

Solution : Rate of interest

10 paise for Rs.10/- for 1 month

$\therefore$ 1 paise for Rs.1/- for 1 month

$\therefore$ for 12 month there will be 12 paise for Rs.1/-

$\therefore$ P = 5400

N = 1 years

R = 12 P

$$I = \frac{PNR}{100}$$

$$= \frac{5\cancel{400} \times 1 \times 12}{1\cancel{00}}$$

$$= 648$$

Q.47 Find the time taken by Abhay to cover a distance of $(6t^3 + 19t^2 + 13t - 3)$ km at the speed of $(2t + 3)$ km/hr.

1) $3t^2 + 5t - 1$ 2) $3t^3 + 3t^2 - 1$

3) $6t^3 + 19t^2 + 11t$ 4) $12t^4 + 56t^3 + 83t^2 + 33t - 9$

Ans. : (1) $3t^2 + 5t - 1$

Solution : Distance = speed x time

$$\therefore \text{time} = \frac{\text{distance}}{\text{speed}} = \frac{6t^3 + 19t^2 + 13t - 3}{(2t + 3)}$$

$$\begin{array}{r} 2t+3 \overline{)6t^3+19t^2+13t-3} (3t^2+5t-1 \\ \underline{-6t^3+9t^2} \\ +10t^2+13t \\ \underline{-10t^2 \pm 15t} \\ -2t-3 \\ \underline{+2t+3} \\ 0 \quad 0 \end{array}$$

Q.48 When the price of a pressure cooker was increased by 15%, the sale of pressure cooker decreased by 15%. What was the net effect on the sales ?

1) No effect 2) 15% increase 3) 2.25% increase **4) 2.25% decrease**

Ans. : (4) 2.25% decrease

Solution : One article occurs a gain of x% and other a loss of x%

Then the overall loss % = $\left(\frac{x}{10}\right)^2$ %

$$\therefore \left(\frac{x}{10}\right)^2 \% = \left(\frac{15}{10}\right)^2 \%$$

$$= \frac{225}{100}\%$$

= 2.25% decrease

Q.49 From which of the following option triangles can be drawn ?

(a) 4.2 cm, 3 cm, 8 cm (b) 3.5 cm, 4.7 cm, 8.1 cm

(c) 9.2 cm, 4.6 cm, 4.6 cm (d) 3.9 cm, 7.5 cm, 3.8 cm

1) a, b **2) b, d** 3) b, c 4) c, d

Ans. : (2) b, d

Solution : $3.5 + 4.7 > 8.1$

$3.9 + 3.8 > 7.5$

Q.50 If $\frac{x-3}{7}$ is an even number, what is the 8th odd number after it ?

1) $\frac{x-108}{7}$ **2)** $\frac{x+102}{7}$ 3) $\frac{x+108}{7}$ 4) $\frac{x-102}{7}$

Ans. : (2) $\frac{x+102}{7}$

Solution : $\frac{x-3}{7}+1+14$

$=\frac{x-3}{7}+15$

$=\frac{x-3+105}{7}$

$=\frac{x-102}{7}$

Next 8th number

$\therefore$ Next one odd no and $(7\times 2) = 14$ next 7 nos.

Q.51 Quotient obtained when (x^2+7x-4) is divided by $(x+7)$ is ____

1) x 2) x - 4 3) x + 4 4) x + 2

Ans. : (1) x

Solution :

$$x+7\overline{)x^2+7x-4}(x$$
$$\underline{-x^2+7x}$$
$$0 \quad 0 \quad -4$$

Q.52 If the radius of a right circular cone is 7cm and its height is twice of its radius then find the volume of the cone.

1) 718.66 cm^3 2) 718.66 m^3 3) 817.66 cm^3 4) 711.66 cm^3

Ans. : (1) 718.66 cm^3

Solution : r = 7, h = 2r = 14

volume of a cone $= \frac{1}{3}\pi r^2 h$

$=\frac{1}{3}\times\frac{22}{\cancel{7}}\times\cancel{7}\times 7\times 14$

$= 718.66\ cm^3$

Q.53 If $\frac{5}{7}$ of 49 + 20% of 130 = x + 49. Then x = ?

1) 10 **2) 12** 3) 16 4) 18

Ans. : (2) 12

Solution : $\frac{5}{\cancel{7}}\times\overset{7}{\cancel{49}}+\frac{\cancel{20}}{100}\times 13\cancel{0} = x + 49$

$35 + 26 = x + 49$

$\therefore \quad x = 61 - 49$

$= 12$

Q.54 The difference between circumference and radius of a circle is 37 m. Then what is the circumference of that circle ?

1) 7 m **2) 44 m** 3) 154 m 4) None of these

Ans. : (2) 44 m

Solution : $2\pi r - r = 37$

$\therefore\ r(2\pi - 1) = 37$

$r = 37 \div (2\pi - 1)$

$= 37 \div \left(2 \times \frac{22}{7} - 1\right) = 37 \div \left(\frac{44-7}{7}\right)$

$= 37 \times \frac{7}{37}$

$= 7$

$c = 2r$

$= 2 \times \frac{22}{\cancel{7}} \times \cancel{7} = 44$ cm

Q.55 Cube of a number is equal to 9 times of 24. Then what is the square of that number ?

1) 25 **2) 36** 3) 64 4) 216

Ans. : (2) 36

Solution : $x^3 = 24 \times 9$

$= 9 \times 3 \times 8$

$= 3 \times 3 \times 3 \times 2 \times 2 \times 2$

$x^3 = (3 \times 2)3$

$\therefore\ x = 3 \times 2 = 6$

$\therefore$ The number = 6

and square of the number = $6^2 = 36$

Q.56 The mean of 6, y, 7, x and 14 is 8. Then select two options from the following ? (Select two options)

1) x + y = 13 2) x - y = 13 **3) 27 + x + y = 40** 4) $x^2 + y^2 = 15$

Ans. : (1) x + y = 13 (3) 27 + x + y = 40

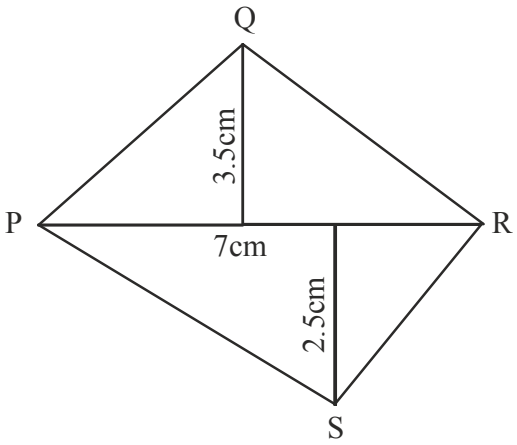
Solution : $\frac{6 + y + 7 + x + 14}{5} = 8$

$\therefore\ x + y + 27 = 40$

$\therefore\ x + y = 40 - 27$

$\therefore\ x + y = 13$

Q.57 Find area of the given quadrilateral PQRS.



1) 210 cm^2 **2) 21 cm^2** 3) 12 cm^2 4) 42 cm^2

Ans. : (2) 21 cm^2

Solution : Area of (□PQRS) $= \frac{1}{2} b (h_1 + h_2)$

$= \frac{1}{2} \times 7 (3.5 + 2.5)$

$= 21 \text{ cm}^2$

Q.58 The government declared $\frac{25}{2}$% rebate on SP of cotton clothes. If the amount of rebate is Rs.8132/-. What amount of clothes were sold ?

1) Rs.60556/- **2) Rs.65056/-** 3) Rs.65065/- 4) None of these

Ans. : (2) Rs.65056/-

Solution : Rebate = $\frac{25}{2}$% of SP

$\therefore \quad 8132 = \left(\frac{25}{2} \times x \right) \div 100$

$8132 \times 100 = \frac{25}{2} x$

$\frac{8132 \times \cancel{100}^{4} \times 2}{\cancel{25}} = x$

$x = 65056$

Q.59 In a $\triangle PQR$, PQ = PR and $\angle Q$ is twice that of $\angle P$. Then $\angle Q$ = ?

1) 72^0 2) 36^0 3) 144^0 4) 108^0

Ans. : (1) 72^0

Solution : Let $\angle P = x$

$\therefore \angle Q = 2x$

PQ = PR

$\therefore$ This is an isosceles $\triangle$

$\therefore \angle Q = \angle R = 2x$

$\angle P + \angle Q + \angle R = 180^0$

$\therefore x + 2x + 2x = 180^0$

$5x = 180$

$x = 36^0$

$\therefore \angle Q = 2x = 2 \times 36 = 72^0$

Q.60 The perimeter of a rectangle is numerically equal to its area. If the width of a rectangle is $2\frac{3}{4}$ cm then its length will be ?

1) $\frac{11}{3}$ cm **2) $\frac{22}{3}$ cm** 3) 11 cm 4) 10 cm

Ans. : (2) $\frac{22}{3}$ cm

Solution : $2(l + b) = l\,b$

$$2\left(l + 2\frac{3}{4}\right) = l \times 2\frac{3}{4}$$

$$2\left(l + \frac{11}{4}\right) = l \times \frac{11}{4}$$

$$2l + \frac{22}{4} = \frac{11}{4}l$$

$$\therefore \frac{22}{4} = \frac{11}{4}l - 2l$$

$$\frac{22}{4} = \frac{3l}{4}$$

$\therefore 22 = 3l$

$\therefore l = \frac{22}{3}$

Q.61 The diameter of a roller is 2.5m and its length is 1.4m. How much area will it cover in 7 revolutions ?

1) 11 m^2 2) 98 m^2 **3) 77 m^2** 4) 24.5 m^2

Ans. : (3) 77 m^2

Solution : d = 2.5m $\therefore$ $r = \frac{2.5}{2}$, h = 1.4 m

curved surface area of roller $= 2\pi rh$

$= 2 \times \frac{22}{7} \times 1.4 \times \frac{2.5}{2}$

$= 11\ m^2$

Area covered in 1 revolution = curved surface are a of roller

$\therefore$ Area covered in 7 revolutions $= 7 \times 11$

$= 77\ m^2$

Q.62 What is the degree of the product of following polynomial ?

$(y^3 - 4)(y^3 - 3y - 5)$

1) -9 2) 9 **3) 6** 4) -6

Ans. : (3) 6

Solution : $(y^3 - 4)(y^3 - 3y - 5)$

$= y^3 (y^3 - 3y - 5) - 4 (y3 - 3y - 5)$

$= y^6 - 3y^4 - 5y^3 - 4y^3 + 12y + 20$

$= y^6 - 3y^4 - 9y^3 + 12y + 20$

$\therefore$ Degree = 6

Q.63 If the surface area of a sphere is 50.24cm^2, what is the radius of that sphere ?

($\pi = 3.14$) (Select two options)

1) 4 cm **2) 2 cm** 3) $\sqrt{16}$ cm **4) $\sqrt{4}$ cm**

Ans. : (2) 2 cm (4) $\sqrt{4}$ cm

Solution : Surface area of sphere = $4\pi r^2$

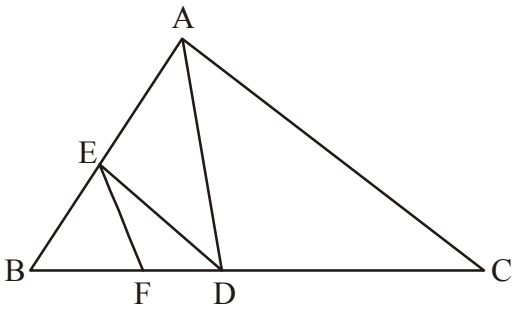
$50.24 = 4 \times 3.14 \times r^2$

$\frac{50.24}{4 \times 3.14} = r^2$

$4 = r^2$

$\therefore$ r = 2

Q.64 In the given figure EF||AD and ED||AC. If BF = 4cm, FD = 6cm and BE = 8 cm. Then BC = ?



1) 12 cm 2) 15 cm **3) 25 cm** 4) None of these

Ans. : (3) 25 cm

Solution : In $\triangle BDA, \frac{BF}{FD} = \frac{BE}{EA}$

$$\frac{4}{6} = \frac{8}{EA}$$

$$\therefore EA = \frac{8 \times 6}{4}$$

$$= 12 \text{ cm}$$

In $\triangle ABC$ ED || AC

$$\therefore \frac{BD}{BC} = \frac{BF}{BA}$$

$$\frac{4+6}{BC} = \frac{8}{8+12}$$

$$\therefore \frac{10}{BC} = \frac{8}{20}$$

$$BC = \frac{\overset{5}{\cancel{10}} \times \overset{5}{\cancel{20}}}{8}$$

$$= 25 \text{ cm}$$

Q.65 $\frac{148}{138} \div \frac{120}{184} = ?$

1) $\frac{45}{74}$ 2) $1\frac{30}{45}$ **3)** $\frac{74}{45}$ 4) $\frac{1}{2}$

Ans. : (3) $\frac{74}{45}$

Solution : $\frac{148}{138} = \frac{120}{184}$

$$\frac{\overset{37}{\cancel{148}}}{\underset{69_3}{\cancel{138}}} \times \frac{\overset{\cancel{92}^{4^2}}{\cancel{184}}}{\underset{30_{15}}{\cancel{120}}} = \frac{74}{45}$$

Q.66 The difference between the compound interest and the simple interest on a certain sum at 10% per annum for 3 years is Rs.93/-. Find the sum.

1) Rs.3331/- 2) Rs.331/- **3) Rs.3000/-** 4) Rs.6000/-

Ans. : (3) Rs.3000/-

Solution : Let the sum be Rs.P R = 10% N = 3

$$SI = \frac{PNR}{100}$$

$$= \frac{P\times 10\times 3}{100}$$

$$= \frac{3P}{10}$$

$$CI = P\left[\left(1+\frac{R}{100}\right)^{n} - 1\right]$$

$$= P\left[\left(1+\frac{10}{100}\right)^{3} - 1\right]$$

$$= P\left[\left(1+\frac{11}{10}\right)^{3} - 1\right]$$

$$= P\left(\frac{1331}{1000} - 1\right)$$

$$= P\left(\frac{1331-1000}{1000}\right)$$

$$= \frac{331P}{1000}$$

CI - SI = 93

$$\therefore \frac{331P}{1000} - \frac{3P}{10} = 93$$

$$\frac{331P - 300P}{1000} = 93$$

$$\therefore 31P = 93 \times 1000$$

$$\therefore P = \frac{93\times 1000}{31} = 3000$$

Q.67 A shopkeepers price is 50% above the cost price. If he allows his customer a discount of 30% what profit does he make ?

1) 15% 2) 10% **3) 5%** 4) 20%

Ans. : (3) 5%

Solution : Let CP = Rs.100/-

$\therefore$ M P = Rs.150/-

Discount = 30%

$$\text{Total discount} = \frac{150 \times 30}{100} = \text{Rs.45/-}$$

$\therefore$ SP = 150 - 45 = Rs.105/-

$$\therefore \text{Gain\%} = \frac{\text{Total Gain} \times 100}{\text{CP}}$$

$$= \frac{5 \times 100}{100}$$

$$= 5\%$$

Q.68 Which number is equal to $\left(\frac{0.1}{0.01} + \frac{0.01}{0.1}\right)$

1) 10.1 2) 1.10 3) 1.01 4) 10.01

Ans. : (1) 10.1

Solution : $\frac{0.1}{0.01} + \frac{0.01}{0.1} = \frac{1}{10} \times \frac{100}{1} + \frac{1}{100} \times \frac{10}{1}$

$$= 10 + \frac{1}{10}$$

$$= 10 + 0.1$$

$$= 10.1$$

Q.69 A survey of 100 people found that 20 of them played badminton. In a pie chart, what would be the sector angle of this group ?

1) 20^0 2) 36^0 **3) 72^0** 4) 200^0

Ans. : (3) 72^0

Solution : sector angle $\theta = \frac{\text{value of the component}}{\text{Total value}} \times \mathbf{360}$

$$= \frac{\cancel{20}}{\cancel{100}} \times \cancel{360}$$

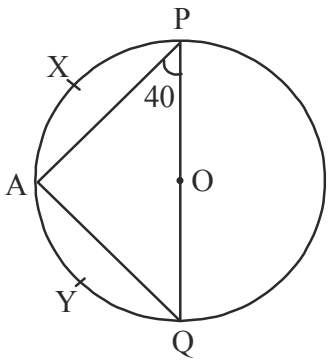
$$= 72^0$$

Q.70 The solution of a linear equation in one variable is always a _____

1) natural number 2) whole number **3) real number** 4) an integer

Ans. : (3) real number

Q.71 In the adjoining figure $m\angle APQ = 40^0$, PQ is the diameter of a circle. The m(Arc A X P) = ?



1) 100^0 2) 70^0 3) 80^0 4) 110^0

Ans. : (1) 100^0

Solution : $m\angle PAQ = 90^0$ (Angle in a semicircle)

$m\angle APQ = 40^0$ given

$\therefore\ m\angle APQ + m\angle PAQ + m\angle AQP = 180^0$

$40 + 90 + m\angle AQP = 180$

$\therefore\ m\angle AQP = 180 - 130$

$= 50^0$

$m(\text{Arc AXP}) = 2\ m\angle AQP$

$= 2 \times 50$

$= 100^0$

Q.72 A circular grass lawn of 35 m in radius has a path 7m wide running around it on the outside. The area of the path is _____

1) 1496 sqm 2) 1450 sqm 3) 1576 sqm **4) 1694 sqm**

Ans. : (4) 1694 sqm

Solution : Radius of inner circle = 35m = r

Radius of outer circle = R = 35 + 7

= 42 m

Area of circular path

= Area of outer circle - Area of inner circle

$= \pi R^2 = \pi r^2$

$= (R^2 - r^2)$

$= (R - r)(R + r)$

$= \frac{22}{7}(42 - 35)(45 + 35)$

$= \frac{22}{7} \times 7 \times 77$

= 1694 sq m

Q.73 If $x^2 + \frac{1}{x^2} = 51$, find the value of $\left(x - \frac{1}{x}\right) = ?$

1) 7 2) 49 3) 53 4) 51

Ans. : (1) 7

Solution : $\left(x - \frac{1}{x}\right)^2 = x^2 - 2 + \frac{1}{x^2}$

$= \left(x^2 - \frac{1}{x^2}\right)^2 - 2$

$= 51 - 2$

$\left(x - \frac{1}{x}\right)^2 = 49$

$\therefore x - \frac{1}{x} = 7$

Q.74 If $x^{-2} = 64$ then $x^{\frac{1}{3}} + x^0 = ?$ (Choose two options)

1) 1.5 2) 0.66 **3)** $\frac{3}{2}$ 4) $\frac{2}{3}$

Ans. : (1) 1.5

Solution : $\mathbf{x^{-2} = 64}$

$\therefore \frac{1}{x^2} = 64$

$\therefore \frac{1}{64} = x^2$

$\therefore \frac{1}{8} = x$

$x^{\frac{1}{3}} + x^0$

$= \left(\frac{1}{8}\right)^{\frac{1}{3}} + \left(\frac{1}{8}\right)^6$

$= \left(\frac{1}{(2^3)^{\frac{1}{3}}}\right) + 1$

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

$= \frac{3}{2}$

$= 1.5$

Q.75 Write the following algebric expression is ascending order.

$x - x^8 + x^2 - 1.7x^{10} + 1.4x^8 - 7.8x^2 + 4 - 9x$

1) $4 - 8x - 6.8x^2 + 0.4x^8 - 1.7x^{10}$ 2) $-1.7x^{10} + 0.4x^8 - 6.8x^2 - 8x + 4$

3) $4 - 6.8x - 8x^2 + 0.4x^8 - 1.7x^{10}$ 4) None of these

Ans. : (1) $4 - 8x - 6.8x^2 + 0.4x^8 - 1.7x^{10}$

Solution : $x - x^8 + x^2 - 1.7x^{10} + 1.4x^8 - 7.8x^2 + 4 - 9x$

$= 4 + x - 9x + x^2 - 7.8x^2 - x^8 + 1.4x^8 - 1.7x^{10}$

$= 4 - 9x - 6.8x^2 + 0.4x^8 - 1.7x^{10}$