Answer Script of Work Sheet on Mensuration, Algebraic Expression & Pythagorean Theorem

Mensuration

Ans to the Q. No-1 (a)

We know, 4046.8654 Sqm = 1 acre

$\therefore$ 1 sqm = $\frac{1}{4046.86}$ acre

$\therefore$ 6250 sqm = $\frac{6250}{4046.86}$ Acre

= 1.544 acre (Ans

"b"

Let, Breadth be "x"

Length be 4x [Length = 4 times of breadth]

We know,

Area of rectangle = Length × Breadth

or, 44100 = (4x × x)

or, $4x^2 = 44100$

or, $x^2 = \frac{44100}{4} = 11025$

$\therefore x = \sqrt{11025} = 105$ m

$\therefore$ Breadth = 105, Length = 420 m

Ans to the Q.NO-1 (c)

Given,

Area of the rectangle = 44100

Also, area of the rectangular garden = Area of square sized field

We know,

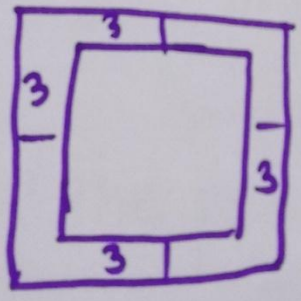
Area of square $= a^2$

Now, $a^2 = 44100$

or, $a = \sqrt{44100}$

$\therefore a = 210\,m$

Breadth of the road outside sq field = 3m



Now, the length of one side of outer square $= \{210 + (3+3)\} = 216\,m$

Area of the outer square $= (216)^2\,m$

$= 46656\,m^2$

Ans to the Q. NO-1 (c)

Area of road = (Area of outer sq - Area of inner sq)

$= (46656 - 44100)$

$= 2556\ m^2$

Cost of $1\ m^2$ = Tk. 11

" " $2556\ m^2$ = Tk (2556×11)

= Tk 28116 (Ans)

Ans to the Q. NO - 2 (a)

Given,
Length of the pond is 60 m
breadth " " " " 40 m

∴ perimeter of the pond
= 2 (length + breadth)
= 2 (60+40) m
= 2 × 100
= 200 m (Ans)

Ans to the Q. NO - 2 (b)

Given, Length of the pond = 60 m
breadth " " = 40 m

∴ Area of the pond = (60×40) m^2
= 2400 m^2

Length of the pond including bank
= (60 + 4×2) = 68 m

breadth of the pond including bank
= (40 + 4×2)
= 48 m

Ans to the Q. NO-2 (b)

Area of the pond including bank

$= (68 \times 48)\ m^2$

$= 3264\ m^2$

$\therefore$ Area of the bank $= (3264 - 2400)$

$= 864\ m^2$

Now,

Area of the square stone $= (2 \times 2)\ m^2$

$= 4\ m^2$

$\therefore$ Pieces of stone needed in the bank

$= (864 \div 4)$

$= 216$ pieces. (Ans)

Ans to the Q. NO - 2 (c)

Given, Length of the pond $= 60\ m$

breadth " " $= 40\ m$

depth " " $= 8\ m$

$\therefore$ Volume of the pond $= (60 \times 40 \times 8)\ m^3$

$= 19200$ cubic meter

P. T. O

2/C

Volume of the water contained in the Pond 19200 cubic meter

Now,

time required to empty $0.3\,m^3$ 1 Second

$\therefore$ " " " 1 $= \frac{1}{0.3}$ "

" " " 19200 " $= \frac{19200}{0.3}$

$= 64000$ Sec

$= \frac{64000}{3600}$ hour

$= 17.68$ hours (Ans)

Ans to the Q. NO- 3 (a)

1 nautical mile = 6080 feet

$\therefore$ 2.5 " " = (6080 × 2.5) feet

= 15,200 feet (Ans)

Ans to the Q. NO- 3 (b)

Capacity of the tank = 24,000 litres

= 24000 × 1000 ccm

= 24000000 cm^3

$\therefore$ The inside volume is = $\frac{24000000}{1000000}$ m^3

= 24 cubic meters

Given. Inside length = 4 m

height = 2 m

We know, L × b × h = volume

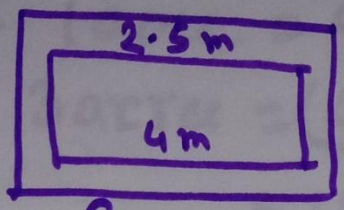
$\Rightarrow$ 4 × breadth × 2 = 24

or breadth = $\frac{24}{8}$ = 3 m

$\therefore$ Inside breadth = 3 meters (Ans)

Ans to the Q.NO-3(c)

Given, thickness of the wall = 250 mm
= 0.25 m



According the figure.

The volume of the two walls Along the ~~breadth~~ length

$= (4 + 2 \times 0.25) \times 0.25 \times 2 \times 2$

$= 4.5\ m^3$

The Volume of the two walls along breadth

$= (3 \times 0.25 \times 2 \times 2)$

$= 3\ m^3$

Total volume of four walls

$= (4.5 + 3)$ cubic meters

$= 7.5\ m^3$ (Ans)

Ans to the Q. NO - 4 (a)

We know, 1 acre = 4046.86 sq m

$\therefore$ 3 acres = (4046.86 × 3) sq m

= 12140.58 sq m (Ans)

Ans to the Q. NO - 4 - (b)

Given, Length = 4.5 m, breadth = 2.5 m

height = 1.5 m

We know, volume = (l × b × h) sq unit

= (4.5 × 2.5 × 1.5) m^3

= 16.875 m^3

We know, 1000 litres = 1 m^3

Therefore, 16.875 m^3 = (16.875 × 1000) litres

= 16875 litres (Ans)

Ans to the Q. NO - 4 (c)

Given,

Length = 4.5 m

breadth = 2.5 m

Area of each wall = $(4.5 \times 2.5)\ m^2$

$= 11.25$ sq m

$\therefore$ Area of four walls of the tank

$= (4 \times 11.25)\ m^2$

$= 45$ sq m (Ans)

Ans to the Q. NO-5 (a)

Given, Area of the triangle = 120 sqcm

Height = 12 cm

We know, Area of triangle = $\frac{1}{2}$ × base × height

or, $120 = \frac{1}{2} \times \text{base} \times 12$

or, base = 20 cm

Ans to the Q-NO - 5 (b)

Given, Volume of tank (V) = 13125 Litre

$= 13.125\ m^3$

Length of the tank, L = 3.5 m

Breadth " " ", B = 2.5 m

We know,

Volume = L × b × h

$\Rightarrow 3.5 \times 2.5 \times \text{height} = 13.125$

or, $\text{Depth} = \frac{13.125}{3.5 \times 2.5}$

$\therefore$ Depth = 1.5 m (Ans)

Ans to the Q. NO 5 (c)

Given, Area = 10 acres

$= (10 \times 4046.86)\ m^2$

$= 40468.6\ m^2$

Let, Breadth of the garden be = x

$\therefore$ Length " " = $3x$

According to the condition,

$(3x \times x) = 40468.6$

or, $3x^2 = 40468.6$

or, $x^2 = \frac{40468.6}{3}$

or, $x^2 = 13489.53$

or, $x = \sqrt{13489.53}$

or, $x = 116.14\ m$

$\therefore$ Length $= (116.14 \times 3) = 348.43$

$\therefore$ perimeter $= 2\ (L + B)$

$= 2 \times (348.43 + 116.14)$

$= 2 \times 464.57$

$= 929.14\ m$ (Ans)

Ans to the Q. NO. 6 (a)

Given, Length of gold bar = 4.4 cm
Breadth " " " = 3.2 cm
height " " " = 1.4 cm

∴ Volume of the gold ban = (4.4 × 3.2 × 1.4)
= 19.712 cubic cm (An

Ans to the Q. NO - 6 (b)

From "a" we get,
Volume of the gold bar = 19.712 cm³

We know,
Weight of 1 ccm Pure water is 1 gram
∴ Gold is 19.3 times heavier than water
∴ Weight of 1 ccm of gold = (1 × 19.3) gram
∴ weight of 19.712 ccm of gold
= (19.3 × 19.712)
= 380.44 gram (Ans)

Ans to the Q. NO - 6 (c)

From "b" we get,
weight of the gold ban = 380.44 gram
∴ According to the question, weight of
copper = $(380.44 \times \frac{1}{4})$ gm
= 95.11 gm

Given,
The price of gold per gram = 3000 TK
∴ " of 380.44 gm of gold = 3000 × 380.44
= 1141320 TK

Again, the price of copper per gram = 30
∴ " " " 95.11 gram " = 30 × 95.11
= 2853.3 TK

Now making charge = 3000 TK
∴ Total value = (1141320 + 2853.3 + 3000)
= 1147173.3 taka (Ans)

Ans to the Q. No - 7 (a)

The amount of TK 21000 is spent to Plant grass at the rate of TK 6.75 Per m^2

$$\text{Area of the garden} = \frac{\text{Total cost}}{\text{cost per sq m}}$$

$$= \frac{21000}{6.75}$$

$$= 3200 \text{ sq m} \quad \text{(Ans)}$$

Ans to the Q. No - 7 - "b"

Area of the garden = 3200 [From - a]

Let, breadth be x m

Length " $= 2x$

Area $= 2x^2$

A.T.Q, $2x^2 = 3200$

or, $x = \sqrt{\frac{3200}{2}}$

$\therefore x = 40$ m

Length $= (2 \times 40) = 80$ m

P.T.O

Ans. Q- 7 (b)

∴ Length of the diagonal

$= \sqrt{\text{length}^2 + \text{breadth}^2}$

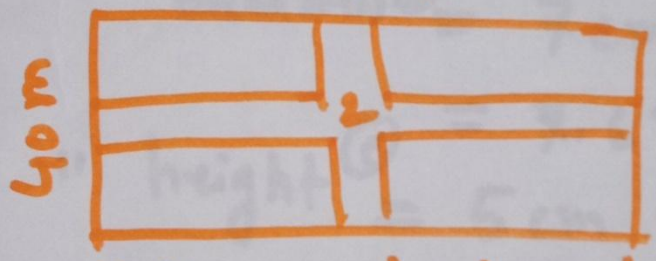
$= \sqrt{80^2 + 40^2}$

$= \sqrt{6400 + 1600}$

$= \sqrt{8000}$

$= 89.44$ meter (Ans)

Ans to Q-N- 7 (c)



Area of the road along length = 80 × 2
= 160 m

" " " " breadth = 2 × 40
= 80 m

Total area = (160 + 80) = 240 m

Since the roads cross each other

∴ total area of two roads = (240 − 4)
= 236 m

Ans to the Q.NO-8-a

Given, the inner length of the iron box
= 15 cm 2.4 mm
= (15×10) + 2.4 mm
[∵ 1 cm = 10 mm]
= 152.4 mm Ans

Ans to the Q. NO - 8-"b"

Given, Inner length (a) = 15 cm 2.4 mm
= 15.24 cm
" breadth, (b) = 7 cm 6.2 mm
= 7.62 cm
" height (c) = 5 cm 8 mm
= 5.8 cm

We know,
whole area of rectangular box
= 2(ab + bc + ca)
= 2{15.24 × 7.62 + 7.62 × 5.8 + 5.8 × 15.24}
= 2 × {116.13 + 44.2 + 88.4}
= 2 × 248.73 = 497.5 cm² Ans

Ans to the Q.NO - 8. "C"

Given, Length of the gold bar = 13.47 cm

breadth = 1.5 cm, height = 1 cm

$\therefore$ Volume = $(13.47 \times 1.5 \times 1)\ cm^3$

$= 20.205$ cubic cm.

Inner volume of the box

$= (15.24 \times 7.62 \times 5.8)\ cm^3$

$= 673.54\ cm^3$

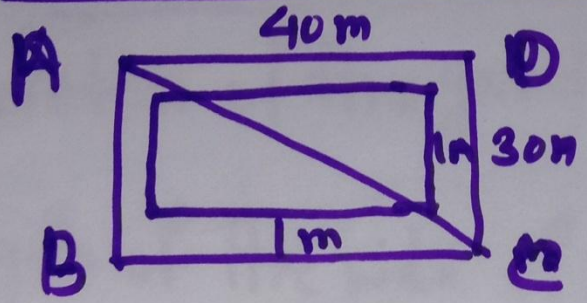
$\therefore$ The highest number of gold bar which can be kept on the box

$$= \frac{\text{Inner volume of the box}}{\text{Volume of the gold bar}}$$

$$= \frac{673.54}{20.205} = 33.34$$

That is 33.34 pieces (Ans)

Ans to the Q. No - 9 (a)



Area of rectangular garden ABCD

= Area of $\triangle ABC$ + Area of $\triangle ADC$

$= \frac{1}{2} \times 40 \times 30 + \frac{1}{2} \times 40 \times 30$

$= (600 + 600)\ m^2$

$= 1200\ m^2$ (Ans)

Ans to the Q. No - 9 (b)

Length of the garden without road $= (40 - 2)$

$= 38$ m

breadth " " " " $= (30 - 2) = 28$ m

Area " " " " $= 38 \times 28$

$= 1064\ m^2$

Area of the road $= (1200 - 1064)$

$= 136\ m^2$ Ans

Ans to the Q.No. 9(c)

Perimeter of the garden $= 2 \times (40+30)$
$= 140\text{m}$

Length of the side of the square
$= \frac{140}{4}$
$= 35\text{ m}$

Area of the square $= (35 \times 35)$
$= 1225\text{ m}^2$

Side of the square garden including path
$= 35 + 3 \times 2$
$= 41\text{ m}^2$

Area of square including path
$= 41 \times 41$
$= 1681\text{ m}^2$

$\therefore$ area of the path $= 1681 - 1225$
$= 456\text{ m}^2$

$\therefore$ Total cost for planting grass
$= (456 \times 7)$
$= 3192$ taka (Ans)

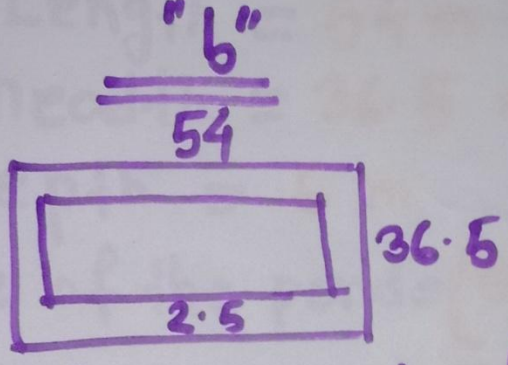
Ans to the Q. NO- 10 /a

Perimeter of the pond

$= 2(\text{length} + \text{breadth})$

$= 2(54 + 36.5)$

$= 181$ meters [Ans]



Area of the pond $= (54 \times 36.5)$

$= 1971\ m^2$

Length of the pond excluding bank

$= (54 - 2.5 \times 2)$

$= 49\ m$

breadth of the pond excluding bank

$= 36.5 - 2.5 \times 2$

$= 31.5\ m$

Area of the pond excluding bank

$= (49 \times 31.5)$

$= 1543.5\ m^2$

Ans. 10 | b

Area of the bank = (1971 - 1543.5)

= 427.5 Sq m (Any

Ans. 10 | C

Given, Length = 54 m

breadth = 36.5 m

depth = 6 m

Volume of the pond = (54 × 36.5 × 6)

= 11826 cubic m.

∴ Volume of the water Contained in the pond

= 11826 cm^3

Now,

Time required to empty 0.2 m^3 1 Second

∴ " " " " 1 " $\frac{1}{0.2}$

" " " " 11826 m^3 = $\frac{11826}{0.2}$ Sec

= 16.425 hrs

Ans to the Q. NO - 11/a

Given Breadth is 'a'

So, Length will be 3a [accordingly]

Therefore, Perimeter = 2(L+B)

= 2(3a+a)

= 8a (Ans)

Ans - 11/b

Given,

Tk 6.50 spent for 1 sq m

Tk 1 " " $\frac{1}{6.5}$

Tk 955.5 " " $\frac{955.5}{6.5}$

= 147 sq m

So, The area = 147 sq.m

Let, breadth = x

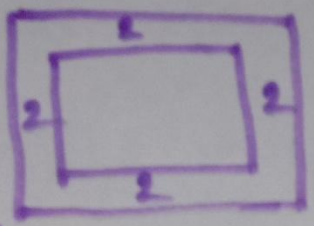
∴ Length = 3x

A.T.Q, $3x^2 = 147$

$x = \sqrt{\frac{147}{3}} = 7m$

→ Length = 3×7 = 21m Ans

Ans 11 / c



From 'b',

Length = 21 m, breadth = 7m

There is 2 m wide road

Length of region with road = 21 + 2×2
= 25 m

breadth " " " " = 7 + 2×2
= 11 m

Area " " " " = 25 × 11
= 275

Area of the road = (275 - 147)
= 128 sq m.

Ans to the Q. No - 12/a

Given, Length of the floor = 20 m
and breadth " " " = 10 m
∴ Area " " = (L × b) sq unit
= (20 × 10) sq meter
= 200 sq m. (Ans

Ans to the Q. No - 12/b

Given, height of the house = 5 m
∴ Volume " " = (L × b × h) cubic unit
= (20 × 10 × 5) cubic cm
= 1000 m^3
= 1000 × 1000000 cm^3
= 1000000000 cm^3

The air is 0.00129 times heavier than water.
∴ Weight of 1 cm^3 of water = 1 gram
∴ " " 1 cm^3 of air = 0.00129 gm
So, the weight of the air that in the house = 1000000000 × 0.00129 gm

12/b

= 1290000 gm

= 1290 kg (Ans)

12/c

Length of the house including walls

= 20 + 2×0.12

= 20.24 m

breadth " " = 10 + 2×0.12

= 10.24 m

∴ Area of the house including walls

= (20.24 × 10.24) m^2

= 207.2576 m^2

Area of the bottom of the walls

= (207.2576 - 200)

= 7.2576 m^2

Volume of the walls = Area of bottom × height

= 7.2576 × 5

= 36.288 m^3 [Ans]

Ans to the Q. NO - 13/a

Let, breadth of the house be = x meter

Length " " " = $(x \times \frac{5}{2}) = \frac{5x}{2}$.

Area " " " = $(x \times \frac{5x}{2}) = \frac{5x^2}{2}$

Ans - 13/b

Tk 25 is spent to coven 1 sq m

" 1 " " $\frac{1}{25}$

" 6250 " " $\frac{1 \times 6250}{25} = 250\ m^2$

A.T.Q,

$$\frac{5x^2}{2} = 250$$

or $x = \sqrt{\frac{250 \times 2}{5}}$

or $x = \sqrt{100} = 10$ m

So, breadth = 10 m

Length = $(\frac{5}{2} \times 10)$

= 25 m (Ans)

Ans to Q. NO - 13/c

Given, height of the house = 5m

From-b, Length is = 25m

breadth = 10 m

So, Volume of the house = $(l \times b \times h)$ cubic unit

$= (25 \times 10 \times 5)$

$= 1250\ m^3$

$= 1250 \times 1000000\ cm^3$

$= 1250000000\ cm^3$

The air is 0.00129 times heavier that water.

we know,

weight of $1\ cm^3$ of water = 1 gram

" " " " air = 0.00129×1 gm

The weight of air that in the house

$= 1250000000 \times 0.00129$

$= 1612500$ gram

$= 1612.5$ kg [Ans]

Ans to the Q No. 14/a

Let breadth of the house = x meter

Length " " " = $x \times 1\frac{1}{2}$

A.T.Q, = $\frac{3x}{2}$ m

$$\frac{3x}{2} \times x = 150$$

$$\Rightarrow 3x^2 = 300$$

$$\text{or, } x^2 = \frac{300}{3} = 100$$

$$\text{or } x = \sqrt{100} = 10 \text{ m} \quad \text{(Ans)}$$

14/b

Given. area of Floor = 150 m^2

Length of a side of square = 50 cm

Area " = 0.5 m

Area " $= (0.5 \times 0.5) = 0.25 m^2$

Required number of stone $= \frac{150}{0.25} = 600$

Price of each stone $= \frac{7500}{600}$

$= 12.5$ taka [Ans]

14/c

Given, height of the house = 4 meter

Volume = $(l \times b \times h)\ m^3$

$= (15 \times 10 \times 4)\ m^3$

$= 600\ m^3$

According to the question

Volume of reservoir = Volume of house

$= 600\ m^3$

We know,

$1\ m^3$ of water is 1000 Litre

$\therefore 600\ m^3$ " $= 600 \times 1000$ litres

$= 600000$ Litres

Again we know,

Weight of 1 Litre of pure water = 1 kg

$\therefore 600000$ " " $= (1 \times 600000)$ kg

$= 600000$ kg

[Ans]

Ans to the Q.No. 15/a

Tk 12.5 is spent to coven = 1 sq m

" 1 " " " " = $\frac{1}{12.5}$

" 3200 " " " " = $\frac{1 \times 3200}{12.5}$

= 256 sq. meten (Ans)

15/b

Let, breadth be x m

Length is = 4x

Area = $(4x \times x) = 4x^2$

A.T.Q,

$4x^2 = 256$

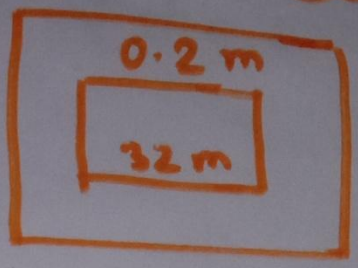
$x^2 = \frac{256}{4} = 64$

$x = \sqrt{64} = 8$ meter

breadth is 8 m

Length is $(8 \times 4) = 32$ m (Ans)

Ans to the Q. No-15/c



From- 'b'

Length = 32 m

breadth = 8 m

Given, thickness of wall = 20 cm
= 0.2 m

height = 3 m

Volume of the house excluding walls

$= (32 \times 8 \times 3)\ m^3$

Now, $= 768\ m^3$

Length of the house including walls $= 32 + 2 \times 0.2$

$= 32.4$ m

and breadth $= 8 + 2 \times 0.2$

$= 8.4$ m

So, Volume of the house including walls

$= 32.4 \times 8.4 \times 3$

$= 816.48\ m^3$

15/c

$\therefore$ Volume of the walls $= (816.48 - 768)$

$= 48.48\ m^3$ Ans

Ans to the Question NO-16/a

We know, 1 yard = 0.9144 m

$\therefore$ 2 yards = (2×0.9144) m

= 1.8288 meter [Ans]

Ans to -16/"b"

We know,

1 cubic meter contain 1000 litre of water

$\therefore$ Volume of 12000 litres of water = $\frac{12000}{1000}$ m^3

$= 12\ m^3$

$\therefore$ Volume of the reservoir = 12 cubic meter

Given, Length of " " = 2.5 m and

breadth " " " = 2 meter

Let, Depth " " = x meter

$\therefore$ Volume = $(2.5 \times 2 \times x) = 5x\ m^3$

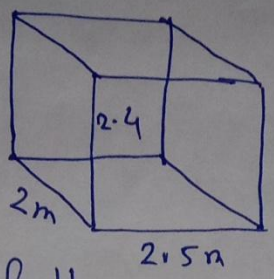
A.T.Q, $5x = 12$

or, $x = 2.40$

$\therefore$ Depth of the reservoir = 2.40 meter

[Ans]

Ans to. Q No - 16/C



Given, Length of the reservoir = 2.5 m
breadth " " " = 2 m
and depth " " " = 2.4 m [From-b]
From the above figure,
total area of upper and lower plane of the reservoir = 2x (lx breadth)
= 2x (2.5 x 2)
= 10 sq m.
And, area of the sides,
= 2x (length x depth) + 2x (breadth x depth)
= 2x (2.5x2.4) + 2x (2x2.4)
= (2x6 + 2x4.8) sq m
= (12 + 9.6) sq m
= 21.6 sq meter
So, Area of the inner Side = (10 + 21.6)
= 31.6 sq m
Total cost to colour = (31.6x25)
= 790 taka [Ans]

MCQs

1. 1 kilometre = what miles?
a) 1.61
b) 1.609
c) 0.621
d) 0.61

2. One nautical mile=?
a) 4080 feet
b) 5080 feet
c) 6070 feet
d) 6080 feet

3. How many feet long is the tap which is used to measure a large length?
a) 30
b) 10
c) 300
d) 100

4. 1 mile = How many km?
a) 0.62
b) 1.16
c) 1.26
d) 1.61

5. How many square metres are there in 1 square yard?
a) 0.24 (Approx)
b) 0.54 (Approx)
c) 0.64 (Approx)
d) 0.84 (Approx)

6. In which country the Metric System is used first?
a) Greek
b) England
c) Japan
d) France

7. How longer is nautical mile than mile in feet?
a) 800
b) 4320
c) 5280
d) 6080

8. What do you mean by 'Deca' in Greek language?
a) 10 times
b) 100 times
c) one tenth
d) one hundredth

9. The length of a rectangle is 330 yards and its breadth is one-third of length. What is the breadth of the rectangle in metres?
a) 100.584
b) 110.584
c) 140.584
d) 440.584

10. The word 'one tenth' comes from which language?
a) Greek
b) Latin
c) Bangla
d) English

11. The length of a small box is 15 cm, breadth 7 cm and height is 5 cm. What is the volume of the box?
a) 27 cubic cm
b) 35 cubic cm
c) 105 cubic cm
d) 525 cubic cm

12. If the base is 1.5m and height is 80 cm, then how much is the area of triangle in sq. metre?
a) 0.6
b) 1.2
c) 60
d) 120

13. Gold is 19.3 times heavier than water. The weight of 1 cubic centemetre water is 1 gram. What is the weight of 10 cubic centemetres gold in grams?
a) 1
b) 1.93
c) 19.3
d) 193

14. In which year metric system was first introduced in Bangladesh?
a) 1st July, 1980
b) 1st July, 1981
c) 1st July, 1982
d) 2nd July, 1980

15. What is the weight of 8000 litre pure water?
a) 1 kg
b) 8 kgs
c) 8000 kgs
d) 8000 gm

16. In case of measurement and units -
i. 1 square yard = 9 square feet
ii. 1 inch = 2.54 cm
iii. 1 katha = 72 square yard
Which one is correct?
a) i and ii
b) i and iii
c) ii and iii
d) i, ii and iii

17. The length of a rectangular region is 12 metres and the breadth is 5 metres. Then its -
i. Perimeter 34 metres
ii. Area 60 square metres
iii. The length of a diagonal is 13 metres
Which one of the following is correct?
a) i & ii
b) i & iii
c) ii & iii
d) i, ii & iii

18. If the volume of a reservoir is 9 cubic metres, its length and breadth are 3 metres and 2 metres respectively, then its -
i. height is 1.5 metres
ii. area of base is 6 sq. metres
iii. volume is 9000000 cubic cm.
Which one is correct?
a) i and ii
b) i and iii
c) ii and iii
d) i, ii and ii

19. If length of a paper is 25 cm, breadth is 16 cm and thickness is 0.3 mm of a paper, then how much is the volume in cubic cm of such 10 papers?
a) 0.008
b) 8.00
c) 80
d) 800

20. The length of a box is 3 metres, breadth is 2 metres and height is 1.5 metres. What is the volume of the box?
a) 9 cubic metres
b) 9 sq. metres
c) 6.5 metres
d) 6 cubic metres

21. 1 katha equal to -
i. 720 sq. feet
ii. 80 sq. yard
iii. 67.89 sq. metres (Approx.)
Which one of the following is correct?
a) i and ii
b) i and iii
c) ii and iii
d) i, ii and iii

22. The length of a reservoir is 4 m, breadth is 3 m and height is 2 m. What is the volume of the reservoir in cubic centimetres?
a) 24
b) 2,400
c) 2,40,000
d) 2,40,00,000

23. Observe the following information -
i. 1 inch = 2.54 cm (app.)
ii. 1 cubic feet = 28.67 litre (app.)
iii. 1 cubic metre = 10 stayor (app.)
Which one is correct?
a) i and ii
b) i and iii
c) ii and iii
d) i, ii and iii

24. The length of a box is 3 metres, breadth is 2 metres and height is 1.5 metres. What is the volume of the box?
a) 9 cubic m
b) 9 sq. m
c) 6.5 m
d) 6 cubic m

25. 10 decimal = ___ sq. feet?
a) 4346 sq. feet
b) 4347 sq. feet
c) 4356 sq. feet
d) 4365 sq. feet

26. The perimeter of a square field is 8 yards. What is the area of the field in square feet?
a) 12
b) 24
c) 36
d) 64

27. Area of a rectangular garden is 300 sq. m. and its breadth is 15 m. What is the perimeter of the garden?
a) 10 m
b) 35 m
c) 70 m
d) 300 m

28. 2 miles equal to how many yards?
a) 6080 yards
b) 5280 yards
c) 3520 yards
d) 1760 yards

29. At 4 degree temperature the weight of 1 cc pure water is -
a) 1 gm
b) 100 gm
c) 1000 gm
d) 10000 gm

30. If the area of a rectangular garden is 714 sq. metre and its length is 34 metre, what is the perimeter of the garden?
a) 55 metre
b) 84 metre
c) 110 metre
d) 136 metre

31. In metric system, 1 kilometre equals -

i. 10 hectometre
ii. 100 decametre
iii. 1000 metre

Which one of the following is correct?

a) i and ii
b) i and iii
c) ii and iii
d) i, ii and iii

32. If the volume of a reservoir is is 9 cubic metres, its length and breadth are 3 metres and 2 metres respectively then its -

i. Height is 1.5 metres
ii. Area of base is 6 sq. metres
iii. Volume is 900000 cubic cm.

Which one is correct?

a) i and ii
b) ii and iii
c) i and iii
d) i, ii and iii

33. In Greek language -

i. deca means 10 times
ii. hecto means 100 times
iii. kilo means 1000 times

Which of the following is correct?

a) i and ii
b) ii and iii
c) i and iii
d) i, ii and iii

34. What is the volume of a box wih the length 3 metres, breadth 2 metres and height 1 metre 50centimeter?

a) 6 cubic metres
b) 6.5 cubic metres
c) 7.5 cubic metres
d) 9 cubic metres

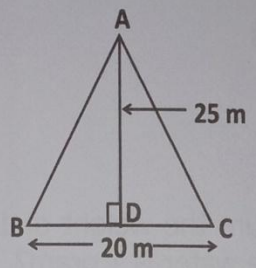
35. If the length of a rectangle is 12 metres and its breadth is 5 metres then its -

i. Perimeter is 34 metres
ii. Area is 60 sq. metres
iii. One of the diagonal is 13 metres

Which one is correct?

a) i and ii
b) i and iii
c) ii and iii
d) i, ii and iii

36.



What is the area of ΔABC?

a) 22.5 sq. m
b) 45 sq. m
c) 250 sq. m
d) 500 sq. m

37. Which of the following is equal to 20 milligram?

a) 2 centigram
b) 2 decagram
c) 2 decigram
d) 2 hectogram

38. 4 nautical mile = how many feet?

a) 24320 feet
b) 18280 feet
c) 7040 feet
d) 6960 feet

39. 1 mile = ?

a) 0.61 km
b) 0.62 km
c) 1.61 km
d) 1.62 km

40. The length of a house is 3m, breadth is 2m and height is 1m. Air is 0.00129 times heavier than water. How many grams of air are there in the house?

a) 0.774 gm
b) 7.74 gm
c) 77.4 gm
d) 7740 gm

41. The length of a side of a cubical tank is 5 metre. Which is the volume of the tank?

a) 125 cubic metres
b) 25 cubic metres
c) 20 cubic metres
d) 15 cubic metres

42. In which temperature the weight of 1 cubic centimeter of pure water is 1 gram?

a) 100° C
b) 1° C
c) 4° F
d) 4° C

43. What is the weight of 250 milliliters water in kg?

a) 0.25
b) 0.50
c) 25
d) 250

44. The area of a rectangular garden is 400 sq. metre and length is 25 metre, then what is its perimetre?

a) 25m
b) 41m
c) 82m
d) 100m

45. If the perimeter of a square ABCD is 'a' unit, then what is the area of it in sq. unit?

a) $a^2/2$
b) $a^2/4$
c) $a^2/8$
d) $a^2/16$

46. 100 Katha = what sq. m. (App.)?

a) 5589
b) 5889
c) 6089
d) 6689

47. 2 Bigha = how many square yards?

a) 720
b) 1440
c) 1600
d) 3200

48. 1 acre = ?

a) 2026.86 sq. metres (approx)
b) 4046.86 sq. metres (approx)
c) 5046.86 sq. metres (approx)
d) 6046.86 sq. metres (approx)

49. What is the meaning of 'Hecto' in Greek language?

a) 10 times
b) 100 times
c) times
d) times

Algebric Expression
Creative question Ans:-

Q.NO- 1 (a)

$$m^4+m^2+1$$
$$= (m^2)^2+2\cdot m^2\cdot 1+1^2-m^2$$
$$= (m^2+1)^2-(m)^2$$
$$= (m^2+m+1)(m^2-m+1)$$ Ans

Ans to the Q.NO. 1 (b)

$$\frac{a}{(a-b)} \times (P \div Q)$$
$$= \frac{a}{(a-b)} \times \frac{a^3-b^3-3ab(a-b)}{(a+b)^2-4ab} \div \frac{(a-b)^2+4ab}{a^3+b^3+3ab(a+b)}$$
$$= \frac{a}{(a-b)} \times \frac{(a-b)(a-b)(a-b)}{(a+)(a-b)} \div \frac{(a+b)(a+b)}{(a+b)(a+b)(a+b)}$$
$$= \frac{a}{(a-b)} \times \frac{(a-b)(a-b)(a-b)}{(a-b)(a-b)} \times \frac{(a+b)(a+b)(a+b)}{(a+b)(a+b)}$$
$$= a(a+b)$$
$$= a^2+ab$$ Ans

1 NO Q. Ans- "C"

Here, $P = (a-b)$ [From - "b"]

$Q = \frac{1}{a+b}$ [From - "b"]

NOW, $L.H.S = \left(\frac{1}{P} - Q\right)(a^2-b^2)$

$= \left(\frac{1}{a-b} - \frac{1}{a+b}\right)(a^2-b^2)$

$= \left\{\frac{a+b-a+b}{(a+b)(a-b)}\right\}(a^2-b^2)$

$= \frac{2b}{(a^2-b^2)} \times (a^2-b^2)$

$= 2b$

$= R.H.S$ (proved)

Ans to the Q. NO - 2 (a)

$$\frac{1}{x-1} - \frac{2x}{x^2-1}$$

$$= \frac{1}{x-1} - \frac{2x}{(x+1)(x-1)}$$

$$= \frac{x+1-2x}{(x-1)(x+1)}$$

$$= \frac{1-x}{(x-1)(x+1)}$$

$$= \frac{-(x-1)}{(x-1)(x+1)}$$

$$= -\frac{1}{x+1} \text{ (Ans)}$$

Ans to the Q.NO - 2 (b)

Given, $A = \frac{x^2-5x+14}{x^2-4x-21}$, $B = \frac{x+2}{x^2+7x+12}$

$C = \frac{4x}{x^2-9}$

NOW, $A \div B = \frac{x^2-5x+14}{x^2-4x-21} \div \frac{x+2}{x^2+7x+12}$

$= \frac{x^2-7x+2x+14}{x^2-7x+3x-21} \div \frac{x+2}{x^2+4x+3x+12}$

$= \frac{x(x-7)+2(x+7)}{x(x-7)+3(x-7)} \div \frac{(x+2)}{x(x+4)+3(x+4)}$

$= \frac{(x-7)(x+2)}{(x-7)(x+3)} \div \frac{(x+2)}{(x+4)(x+3)}$

$= \frac{(x-7)(x+2)}{(x-7)(x+3)} \times \frac{(x+4)(x+3)}{(x+2)}$

$= (x+4)$

NOW, $A \div B \times C = (x+4) \times \frac{4x}{x^2-9}$

$= \frac{4x(x+4)}{(x+3)(x-3)}$ (Ans)

Ans to the Q-NO 2 (c)

$$A = \frac{(x+2)}{(x+3)} \quad [\text{From} - b]$$

$$B = \frac{(x+2)}{(x+4)(x+3)} \quad [\text{From} - b]$$

$$C = \frac{4x}{(x+3)(x-3)}$$

L.C.M of the denominators of the fractions

$$= (x+3)(x-3)(x+4)$$

So, $A = \frac{(x+2)}{(x+3)} = \frac{(x+2)(x-3)(x+4)}{(x+3)(x-3)(x+4)}$

$B = \frac{(x+2)}{(x+4)(x+3)} = \frac{(x+2)(x-3)}{(x+3)(x-3)(x+4)}$

$C = \frac{4x}{(x+3)(x-3)} = \frac{4x(x+4)}{(x+3)(x-3)(x+4)}$ Ans

Ans to the Q.NO-3 (a)

$$\frac{x}{x-y} - \frac{x}{x+y}$$

$$= \frac{x(x+y) - x(x-y)}{(x+y)(x-y)}$$

$$= \frac{x^2+xy-x^2+xy}{x^2-y^2}$$

$$= \frac{2xy}{x^2-y^2}$$ Ans

Ans to the Q.NO-3 (b)

L.C.M of the denominators of the fractions

$$= (a+b)(a-b)$$

∴ 1st fraction → $\frac{a+b}{a-b} = \frac{(a+b)(a+b)}{(a+b)(a-b)}$

2nd fraction → $\frac{a-b}{a+b} = \frac{(a-b)(a-b)}{(a+b)(a-b)}$

3rd fraction → $\frac{2a}{a^2-b^2} = \frac{2a}{(a+b)(a-b)}$ (Ans)

Ans to the Q.NO-3 (c)

$$(P+Q) \div (P-Q)$$

$$= \left\{\frac{a+b}{a-b} + \frac{a-b}{a+b}\right\} \div \left\{\frac{a+b}{a-b} - \frac{a-b}{a+b}\right\}$$

$$= \left\{\frac{(a+b)^2 + (a-b)^2}{(a+b)(a-b)}\right\} \div \left\{\frac{(a+b)^2 - (a-b)^2}{(a+b)(a-b)}\right\}$$

$$= \frac{a^2+2ab+b^2+a^2-2ab+b^2}{(a+b)(a-b)} \div \frac{a^2+2ab+b^2-a^2+2ab-b^2}{(a+b)(a-b)}$$

$$= \frac{2a^2+2b^2}{a^2-b^2} \times \frac{a^2-b^2}{4ab}$$

$$= \frac{2(a^2+b^2)}{2.2ab}$$

$$= \frac{a^2+b^2}{2ab} \text{ (Ans)}$$

Ans to the Q.NO – 4 (a)

Given expression, $\left(\frac{1}{x}-\frac{1}{y}\right) \div \left(\frac{1}{y}-\frac{1}{x}\right)$

$$= \frac{y-x}{xy} \div \frac{x-y}{xy}$$

$$= \frac{y-x}{xy} \times \frac{xy}{x-y}$$

$$= \frac{-1(x-y)}{(x-y)}$$

$$= -1 \quad \text{(Ans)}$$

Ans to the Q.NO – 4 (b)

$$A = \frac{(a-b)^2+2ab}{(a-b)(a^2+2ab+b^2)} = \frac{a^2+b^2}{(a-b)(a+b)^2}$$

$$B = \frac{a^3+b^3}{(a+b)^3(a^2-b^2)} = \frac{(a+b)(a^2-ab+b^2)}{(a+b)^3(a+b)(a-b)} = \frac{(a+b)(a^2-ab-}{(a+b)^4(a-}$$

$$C = \frac{a^3-b^3}{a^4-b^4} = \frac{(a-b)(a^2+ab+b^2)}{(a^2+b^2)(a+b)(a-b)}$$

L.C.M of the denominators

$$= (a+b)^4(a^2+b^2)(a-b)$$

4/6

$$\therefore A = \frac{(a^2+b^2)}{(a+b)^2(a-b)} = \frac{(a^2+b^2)^2(a+b)^2}{(a+b)^4(a^2+b^2)(a-b)}$$

$$\therefore B = \frac{(a+b)(a^2-ab+b^2)}{(a+b)^4(a-b)} = \frac{(a^2+b^2)(a+b)(a^2-ab+b^2)}{(a+b)^4(a^2+b^2)(a-b)}$$

$$\therefore C = \frac{(a-b)(a^2+ab+b^2)}{(a^2+b^2)(a+b)(a-b)} = \frac{(a+b)^3(a-b)(a^2+ab+b^2)}{(a+b)^4(a^2+b^2)(a-b)}$$

Ans

Ans to the Q.No – 4 (c)

$$A = \frac{a^2+b^2}{(a-b)(a+b)^2}, \quad B = \frac{(a+b)(a^2-ab+b^2)}{(a+b)^4(a-b)}$$

$$C = \frac{(a-b)(a^2+ab+b^2)}{(a^2+b^2)(a+b)(a-b)}$$

L.H.S, $A \div B \times C$

$$= \frac{a^2+b^2}{(a-b)(a+b)^2} \div \frac{(a+b)(a^2-ab+b^2)}{(a+b)^4(a-b)} \times \frac{(a-b)(a^2+ab+b^2)}{(a^2+b^2)(a+b)(a-b)}$$

$$= \frac{(a^2+b^2)}{(a-b)(a+b)(a+b)} \times \frac{(a+b)(a+b)(a+b)(a+b)(a-b)}{(a+b)(a^2-ab+b^2)} \times \frac{(a-b)(a^2+ab+b^2)}{(a^2+b^2)(a+b)(a-b)}$$

$$= \frac{a^2+ab+b^2}{a^2-ab+b^2}$$

= R.H.S (proved)

Ans to the Q.No - 5 (a)

Given, $R = a^2 - 8a + 15$

$= a^2 - 5a - 3a + 15$

$= a(a-5) - 3(a-5)$

$= (a-5)(a-3)$ Ans

Ans to the Q.No - 5 (b)

$$\frac{1}{P} = \frac{1}{a^2-2a-8} = \frac{1}{a^2-4a+2a-8} = \frac{1}{a(a-4)+2(a-4)}$$

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

$$\frac{1}{Q} = \frac{1}{a^2-3a-10} = \frac{1}{a^2-5a+2a-10} = \frac{1}{a(a-5)+2(a-5)}$$

$$= \frac{1}{(a-5)(a+2)}$$

$$\frac{1}{R} = \frac{1}{a^2-8a+15} = \frac{1}{(a-5)(a-3)}$$ [From-a]

L.C.M of the denominators:

$= (a-4)(a+2)(a-5)(a-3)$

Now,

$$\frac{1}{P} = \frac{1}{(a-4)(a+2)} = \frac{(a-5)(a-3)}{(a-4)(a+2)(a-5)(a-3)}$$

$$\frac{1}{Q} = \frac{1}{(a-5)(a+2)} = \frac{(a-4)(a-3)}{(a+4)(a-5)(a-3)(a+2)}$$

$$\frac{1}{R} = \frac{1}{(a-5)(a-3)} = \frac{(a+4)(a+2)}{(a+4)(a-5)(a-3)(a+2)}$$ (Ans)

Ans to the Q.NO - 5 (c)

$P = (a-4)(a+2)$

$Q = (a-5)(a+2)$

$R = (a-5)(a-3)$

$$L.H.S = P \times \frac{a-5}{Q} \div \frac{R}{a-3}$$

$$= (a-4)(a+2) \times \frac{(a-5)}{(a-5)(a+2)} \div \frac{(a-5)(a-3)}{(a-3)}$$

$$= (a-4) \div (a-5)$$

$$= \frac{a-4}{a-5}$$

$= R.H.S$ (Proved)

Ans to the Q-NO-6/a

$$\left(1+\frac{2}{x}\right) \div \left(1-\frac{4}{x^2}\right) = \left(\frac{x+2}{x}\right) \div \left(\frac{x^2-4}{x^2}\right)$$

$$= \frac{x+2}{x} \times \frac{x^2}{(x+2)(x-2)}$$

$$= \frac{x}{x-2} \quad (\text{Ans})$$

Ans to the Q-NO-6/b

Here, $A = \dfrac{(x-y)^2+4xy}{a^3-b^3-3ab(a-b)} = \dfrac{(x+y)^2}{(a-b)^3}$

And, $B = \dfrac{x^3+y^3+3xy(x+y)}{(a+b)^2-4ab} = \dfrac{(x+y)^3}{(a-b)^2}$

Now, $A \div B = \dfrac{(x+y)^2}{(a-b)^3} \div \dfrac{(x+y)^3}{(a-b)^2}$

$$= \frac{(x+y)^2}{(a-b)^3} \times \frac{(a-b)^2}{(x+y)^3}$$

$$= \frac{1}{(a-b)(x+y)}$$

Ans to the Q. NO- 6(b)

Now, $A \div B \times \frac{ab-b^2}{xy-y^2}$

$= \frac{1}{(a-b)(x+y)} \times \frac{b(a-b)}{y(x-y)}$

$= \frac{b}{y(x^2-y^2)}$ (Ans)

Ans to the Q. NO- 6(c)

Here, $C = \frac{2x}{x^2+6x+5} = \frac{2x}{x^2+5x+x+5}$

$= \frac{2x}{x(x+5)+1(x+5)} = \frac{2x}{(x+5)(x+1)}$

$D = \frac{2y}{x^3+125} = \frac{2y}{(x)^3+(5)^3} = \frac{2y}{(x+5)(x^2-5x+25)}$

L.C.M of the denominators

$= (x+5)(x+1)(x+5)(x^2-5x+25)$

6/c

Therefore:

$$\frac{2x}{(x+5)(x+1)} = \frac{2x(x^2-5x+25)}{(x+5)(x+1)(x^2-5x+25)}$$

$$\frac{2y}{(x+5)(x^2-5x+25)} = \frac{2y(x+1)}{(x+5)(x+1)(x^2-5x+25)}$$

(Ans)

Ans to Q. NO - 7/a

$$\frac{x^3-1}{x^3+x^2+x} = \frac{(x)^3-(1)^3}{x(x^2+x+1)} = \frac{(x-1)(x^2+x+1)}{x(x^2+x+1)}$$

$$= \frac{x-1}{x} \text{ (Ans)}$$

Ans to the Q. NO - 7/b

Here, $$A = \frac{3x}{x^2+3x-4} = \frac{3x}{x^2+4x-x-4}$$

$$= \frac{3x}{x(x+4)+1(x+4)} = \frac{3x}{(x-1)(x+4)}$$

$$B = \frac{2x}{x^2-1} = \frac{2x}{(x+1)(x-1)}$$

There fore, $A+B$

$$= \frac{3x}{(x-1)(x+4)} + \frac{2x}{(x+1)(x-1)}$$

$$= \frac{3x(x+1)+2x(x+4)}{(x-1)(x+1)(x+4)}$$

$$= \frac{3x^2+3x+2x^2+8x}{(x-1)(x+1)(x+4)}$$

$$= \frac{5x^2+11x}{(x^2-1)(x+4)} \text{ (Ans)}$$

Ans to the Q.NO. 7 (C)

Here the fraction are

$$\frac{1}{3a^2+a-10}, \quad \frac{1}{a^3+8}, \quad \frac{1}{2a^2+9a+10}$$

Denominator of 1st fraction $= 3a^2+a-10$

$$= 3a^2+6a-5a-10$$
$$= 3a(a+2)-5(a+2)$$
$$= (a+2)(3a-5)$$

" of 2nd fraction, a^3+8

$$= (a)^3+(2)^3$$
$$= (a+2)(a^2-a.2+2^2)$$
$$= (a+2)(a^2-2a+4)$$

" of 3rd fraction $= 2a^2+9a+10$

$$= 2a^2+4a+5a+10$$
$$= 2a(a+2)+5(a+2)$$
$$= (a+2)(2a+5)$$

L.C.M of the denominators,

$$(a+2)(3a-5)(a^2-2a+4)(2a+5)$$

P.T.O

Ans to the Q.No 7/e

Therefor,

$$\frac{1}{C} = \frac{1}{(a+2)(3a-5)} = \frac{(a^2-2a+4)(2a+5)}{(a+2)(3a-5)(2a+5)(a^2-2a+4)}$$

$$\frac{1}{D} = \frac{1}{(a+2)(a^2-2a+4)} = \frac{(3a-5)(2a+5)}{(a+2)(3a-5)(2a+5)(a^2-2a+4)}$$

$$\frac{1}{E} = \frac{1}{(a+2)(2a+5)} = \frac{(3a-5)(a^2-2a+4)}{(a+2)(3a-5)(2a+5)(a^2-2a+4)}$$

(Ans)

Ans to the Q.NO-8 (a)

Given fraction, $\frac{a^2+2a-15}{a^2-9}$

$$= \frac{a^2+5a-3a-15}{(a)^2-(3)^2}$$

$$= \frac{a(a+5)-3(a+5)}{(a+3)(a-3)}$$

$$= \frac{(a+5)(a-3)}{(a+3)(a-3)}$$

$$= \frac{a+5}{a+3}$$ Ans

Ans to the Q-NO-8 | b

$$A \div B$$

$$= \frac{(p-q)^2 + 4pq}{p^3 - q^3 - 3pq(p-q)} \div \frac{p^3 + q^3 + 3pq(p+q)}{(p+q)^2 - 4pq}$$

$$= \frac{(p+q)^2}{(p-q)^3} \div \frac{(p+q)^3}{(p-q)^2}$$

$$= \frac{(p+q)^2}{(p-q)^3} \times \frac{(p-q)^2}{(p+q)^3}$$

$$= \frac{1}{(p+q)(p-q)}$$

$$= \frac{1}{p^2 - q^2} \quad (\text{Ans})$$

Ans to the Q. NO - 8 (c)

Here, The fraction are

$$\frac{x}{c} = \frac{x}{x^3+y^3}$$

$$\frac{y}{D} = \frac{y}{x^3-y^3}$$

L.c.m of the denominators $= (x^3+y^3)(x^3-y^3)$

Therefore,

$$\frac{x}{x^3+y^3} = \frac{x(x^3-y^3)}{(x^3+y^3)(x^3-y^3)} = \frac{x(x^3-y^3)}{x^6-y^6}$$

$$\frac{y}{x^3-y^3} = \frac{y(x^3+y^3)}{(x^3+y^3)(x^3-y^3)} = \frac{y(x^3+y^3)}{x^6-y^6}$$ Ans

Ans to the Q. NO- 9/a

Given, $C = x^2 + 4x + 3$

$= x^2 + 3x + x + 3$

$= x(x+3) + 1(x+3)$

$= (x+1)(x+3)$

NOW, $\frac{C}{x^2+x} = \frac{(x+1)(x+3)}{x(x+1)}$

$= \frac{x+3}{x}$ (Ans)

Ans to the Q.NO-9(b)

Given, $A = x^2 - 5x + 6$

$= x^2 - 3x - 2x + 6$

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

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

$B = x^2 - 9$

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

$= (x+3)(x-3)$

$\therefore \frac{1}{A} + \frac{1}{B} = \frac{1}{(x-3)(x-2)} + \frac{1}{(x+3)(x-3)}$

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

$= \frac{2x+1}{(x^2-9)(x-2)}$ (Ans)

Ans to the Q. NO. 9/c

Here, $\frac{1}{A} = \frac{1}{(x-3)(x-2)}$ [From - b]

$\frac{1}{B} = \frac{1}{(x+3)(x-3)}$ ["]

$\frac{1}{C} = \frac{1}{x^2+4x+3} = \frac{1}{x^2+3x+x+3}$

$= \frac{1}{x(x+3)+1(x+3)} = \frac{1}{(x+1)(x+3)}$

L.C.M of the denominators

$= (x-3)(x-2)(x+3)(x+1)$

Now, $\frac{1}{A} = \frac{1}{(x+3)(x-2)} = \frac{(x+3)(x+1)}{(x+1)(x-2)(x+3)(x-3)}$

$\frac{1}{B} = \frac{1}{(x+3)(x-3)} = \frac{(x+1)(x-2)}{(x+1)(x-2)(x+3)(x-3)}$

$\frac{1}{C} = \frac{1}{(x+1)(x+3)} = \frac{(x-2)(x-3)}{(x+1)(x-2)(x+3)(x-3)}$

(Ans)

Ans to the Q. NO- 10 (a)

Given, $M = x^2 - 3x + 2$

$= x^2 - 2x - x + 2$

$= x(x-2) - 1(x-2)$

$= (x-1)(x-2)$

$\therefore \frac{M}{x-2} = \frac{(x-1)(x-2)}{(x-2)}$

$= (x-1)$ Ans

Ans to the Q.NO-10|b

From "a" we get, $M = (x-2)(x-1)$

Given, $N = x^2 - 5x + 6$

$= x^2 - 3x - 2x + 6$

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

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

And, $K = x^2 - 4x + 3$

$= x^2 - 3x - x + 3$

$= x(x-3) - 1(x-3)$

$= (x-1)(x-3)$

Now, $\frac{1}{M} + \frac{1}{N} + \frac{1}{K}$

$= \frac{1}{(x-2)(x-1)} + \frac{1}{(x-2)(x-3)} + \frac{1}{(x-1)(x-3)}$

$= \frac{x-3+x-1+x-2}{(x-1)(x-2)(x-3)}$

$= \frac{3x-6}{(x-1)(x-2)(x-3)} = \frac{3(x-2)}{(x-1)(x-2)(x-3)}$

$= \frac{3}{(x-1)(x-3)}$ (Ans)

Ans to the Q.NO-10/c

1st fraction, $\frac{1}{M} = \frac{1}{(x-2)(x-1)}$ [From-a]

2nd " $\frac{1}{N} = \frac{1}{(x-2)(x-3)}$ [From-b]

3rd " $\frac{1}{K} = \frac{1}{(x-1)(x-3)}$ [From-b]

L.C.M of the denominators

$= (x-2)(x-1)(x-3)$

$\therefore$ 1st Fraction: $\frac{1}{(x-2)(x-1)} = \frac{(x-3)}{(x-1)(x-2)(x-3)}$

2nd fraction $\frac{1}{(x-2)(x-3)} = \frac{(x-1)}{(x-1)(x-2)(x-3)}$

3rd fraction; $\frac{1}{(x-1)(x-3)} = \frac{(x-2)}{(x-1)(x-2)(x-3)}$

(Ans)

Ans to the Q-NO-11 (a)

$$\frac{x-2}{x} + \frac{x-2}{2}$$

$$= \frac{2(x-2) + x(x-2)}{2x}$$

$$= \frac{2x-4+x^2-2x}{2x}$$

$$= \frac{x^2-4}{2x}$$

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

$$= \frac{(x+2)(x-2)}{2x}$$ (Ans)

Ans to the Question No. 11/6

$$\left(\frac{1}{A}+\frac{1}{B}\right) = \frac{1}{6p^2-p-1} + \frac{1}{4p^2-1}$$

$$= \frac{1}{6p^2-3p+2p-1} + \frac{1}{(2p)^2-(1)^2}$$

$$= \frac{1}{3p(2p-1)+1(2p-1)} + \frac{1}{(2p+1)(2p-1)}$$

$$= \frac{1}{(2p-1)(3p+1)} + \frac{1}{(2p+1)(2p-1)}$$

$$= \frac{2p+1+3p+1}{(2p+1)(2p-1)(3p+1)}$$

$$= \frac{(5p+2)}{(4p^2-1)(3p+1)}$$

$$\therefore \left(\frac{1}{A}+\frac{1}{B}\right) \div \frac{5p+2}{(4p^2-1)(3p+1)}$$

$$= \frac{(5p+2)}{(4p^2-1)(3p+1)} \times \frac{(4p^2-1)(3p+1)}{(5p+2)}$$

$$= 1 \quad \text{(Ans)}$$

Ans to the Question NO- 11/c

$$\frac{1}{C} = \frac{1}{p^3 - q^3} = \frac{1}{(p-q)(p^2+pq+q^2)}$$

$$\frac{1}{D} = \frac{1}{p^4 + p^2q^2 + q^4} = \frac{1}{(p^2)^2 + 2p^2q^2 + (q^2)^2 - p^2q^2}$$

$$= \frac{1}{(p^2+q^2)^2 - (pq)^2} = \frac{1}{(p^2+pq+q^2)(p^2-pq+q^2)}$$

L.C.M of the denominators

$$(p-q)(p^2+pq+q^2)(p^2-pq+q^2)$$

$$\frac{1}{C} = \frac{1}{(p-q)(p^2+pq+q^2)} = \frac{p^2-pq+q^2}{(p-q)(p^4+p^2q^2+q^4)}$$

$$\frac{1}{D} = \frac{1}{(p^2+pq+q^2)(p^2-pq+q^2)} = \frac{(p-q)}{(p-q)(p^4+p^2q^2+q^4)}$$

(Ans)

MCQs

1. Which one of the following is the square of $(x - 3y)$?
   a) $x^2 + 6xy + 9y^2$
   b) $x^2 - 6xy + 9y^2$
   c) $x^2 + 6xy - 9y^2$
   d) $x^2 - 6xy - 9y^2$

2. Which one is the square of $(x + 2y)$?
   a) $x^2 + 2xy + y^2$
   b) $x^2 + 4xy + 4y^2$
   c) $x^2 + 2xy + 4y^2$
   d) $x^2 + xy + y^2$

3. Which is the difference of the square of $(x + 6)$ and $(x + 4)$?
   a) $x^2 - 6^2$
   b) $x^2 - 4^2$
   c) $(x)^2 - (10)^2$
   d) $(x + 5)^2 - (1)^2$

4. If $x^2 + {}^1/_{x2} = 1$, what is the value of $x + {}^1/_x$?
   a) $\sqrt{2}$
   b) $\sqrt{3}$
   c) 2
   d) 3

5. Which one is the square of the algebraic expression $a + b - c$?
   a) $a^2 + b^2 + c^2$
   b) $a^2 + b^2 + c^2 + 2ab - 2bc + 2ca$
   c) $a^2 + b^2 + c^2 + 2ab - 2bc - 2ca$
   d) $a^2 + b^2 + c^2 + 2ab + 2bc - 2ca$

6. What is the value of $(a - {}^1/_a)^2$, if $a + {}^1/_a = 4$?
   a) 8
   b) 12
   c) 16
   d) 20

7. If $a + {}^1/_a = 3$, then which is the value of $a^2 + {}^1/_a{}^2$?
   a) 5
   b) 7
   c) 11
   d) 13

8. If $a - b = 5$ and $ab = 3$ then what is the value of $a^2 + b^2$?
   a) 13
   b) 19
   c) 31
   d) 37

9. if $x + {}^{1}/_{x} = 2$, then which one of the following is the value of $x - {}^{1}/_{x}$?

a) 0
b) 1
c) 2
d) 3

10. If $a + b = 7$ and $a - b = 3$, then which one of the following is the value of $a^2 + b^2$?

a) 20
b) 29
c) 40
d) 58

11. Which one of the following is correct of expression of $(y + 4)(y + 2)$ as the difference of two square?

a) $(y + 3)^2 - 1$
b) $(y + 4)^2 - 1$
c) $(y + 2)^2 - 1$
d) $(x - 3)^2 - 1$

12. If $x = p + {}^{1}/_{p}$ and $y = p - {}^{1}/_{p}$ then $(x + y)^2 = ?$

a) $2p$
b) $4p$
c) $2p^2$
d) $4p^2$

13. If $a^4 + {}^{1}/_{a^4} = 119$ then $a^2 + {}^{1}/_{a^2} = ?$

a) 11
b) $\sqrt{119}$
c) 13
d) 19

14. If $x - {}^{1}/_{x} = 6$, what is the value of $(x + {}^{1}/_{x})^2$?

a) 32
b) 38
c) 40
d) 44

15. If $a + b = 5$, $a - b = 4$, $a^2 - b^2 = ?$

a) 9
b) 10
c) 15
d) 20

16. If $a^2 - 1 = 5a$, what is the value of $a^2 + {}^{1}/_{a^2}$?

a) 21
b) 23
c) 25
d) 27

17. If $x + {}^{1}/_{x} = 2$, which one is the value of $x^3 + {}^{1}/_{x^3}$?

a) 0
b) 2
c) 12
d) 14

18. Which one is the cubic value of $x^3 + 2$?

a) $x^6 + 8$
b) $x^9 + 8$
c) $x^6 + 4x^3 + 4$
d) $x^9 + 6x^6 + 12x^3 + 8$

19. If $x - {}^{1}/_{x} = 1$, which one of the following is the value of $x^3 - {}^{1}/_{x^3}$?

a) 4
b) 6
c) 7
d) 8

20. If $a^3 - b^3 = 36$, $a - b = 3$, then $ab = ?$

a) -1
b) 0
c) 1
d) 3

21. If $x + y = 2$, $x^3 + y^3 + 6xy = ?$

a) -8
b) 0
c) 8
d) 10

22. If $x + {}^1/_x = 2$, then which one is the value of $(x^3 + {}^1/_x{}^3)$?

a) 0
b) 2
c) 12
d) 14

23. Which one of the following will be right if we express $(3x - 7)(7 + 3x)$ in the form of the difference between two squares?

a) $3x^2 - 49$
b) $(3x)^2 - (49)^2$
c) $9x^2 - 7$
d) $9x^2 - 49$

24. Which one of the following is the H.C.F. of $x^2y + xy^2$ and $x^3 + y^3$?

a) $x + y$
b) $x(x + y)$
c) $x^2 + y^2$
d) $x^3 + y^3$

25. Which one is the H.C.F. of $x^3 + x^2y$, $x^2y + xy^2$ and $x^3 + y^3$?

a) $x + y$
b) $x(x + y)$
c) $x^2(x + y)$
d) $xy(x + y)$

26. Which of the following is the H.C.F. of $(a^3 + b^3)$ and $(a^3 - b^3)$?

a) 1
b) a -b
c) a + b
d) $a^2 + ab + b^2$

27. What is the HCF of ^{x2} -4, $x^2(x - 2)$ and $x^2y - 2xy$?

a) x -2
b) x + 2
c) x (x -2)
d) (x + 2) (x - 2)

28. H.C.F. of $a^3 - b^3$ and $a^3 + b^3$ is --

a) a -b
b) a +b
c) 0
d) 1

29. Which one of the following is the H.C.F of $a + b$, $a^2 + ab$ and $a^2 - b^2$?

a) a (a -b)
b) a -b
c) $a(a^2 - b^2)$
d) $a^2 - b^2$

30. Which is the L.C.M. of $4ab^2x^3$, $9a^3c$ and $12a^3bc^4x$?

a) $36a^3b^2c^4x^3$
b) $36a^3b^3c^4$
c) $36ab^3c^4x$
d) $a^3b^2c^4x$

31. Which one of the following is the L.C.M.of $x^2 - 9$ and $x^2 - 3x$?

a) $x^2 - 3x$
b) $x^2 - 9$
c) x + 3
d) $x(x^2 - 9)$

32. What is the L.C.M. of a -b, a^2 -ab and $a^2 - b^2$?

a) a (a -b)
b) a-b
c) $a(a^2 - b^2)$
d) $a^2 - b^2$

33. Which one of the following is the H.C.F. of $a + b$, $a^2 + ab$, $a^2 - b^2$?

a) $a(a - b)$
b) $a + b$
c) $a(a^2 - b^2)$
d) $a^2 - b^2$

34. What is the L.C.M. of $4ab^2x^3$, $9a^3c$ and $12a^3bc^4x$?

a) $36a^3b^2c^4x^3$
b) $36a^3b^3c^4$
c) $36ab^3c^4x$
d) $a^3b^2c^4x$

35. Which one of the following is the L.C.M.of $x^2 - 9$ and $x^2 - 3x$?

a) $x^2 - 3x$
b) $x^2 - 9$
c) $x + 3$
d) $x(x^2 - 9)$

36. What is the L.C.M. of $a - b$, $a^2 - ab$ and $a^2 - b^2$?

a) $a(a - b)$
b) $a - b$
c) $a(a^2 - b^2)$
d) $a^2 - b^2$

37.

Which one of the following is the lowest value of $\frac{x^2 - 7x + 12}{x^2 - 6x + 9}$?

a) $\frac{x - 4}{x - 3}$ b) $\frac{x + 4}{x - 3}$ c) $\frac{x - 4}{x + 3}$ d) $\frac{x + 4}{x + 3}$

38.

Which one of the following is the lowest value of $\frac{x^3 + 3x^2}{x^2 - 9}$?

a) $\frac{x^2}{x - 3}$ b) $\frac{x^2}{x + 3}$ c) $\frac{x}{x - 3}$ d) $\frac{x + 3}{x - 3}$

39.

What is the simplified form of $\frac{x - y}{x} - \frac{x + y}{y}$?

a) $\frac{-(x^2 + y^2)}{xy}$ b) $\frac{-(x^2 - y^2)}{xy}$ c) $\frac{(x - y)^2}{xy}$ d) $\frac{(x - y)^2}{xy}$

40.

Which one of the following is the lowest form of $\frac{x^2-1}{x+1}$?

a) x b) $x+1$ c) $x-1$ d) x^2+1

41.

What one of the following is the lowest value of $\frac{x^3+3x^2}{x^2-9}$?

a) $\frac{x^2}{x-3}$ b) $\frac{x^2}{x+3}$ c) $\frac{x}{x-3}$ d) $\frac{x+3}{x-3}$

42.

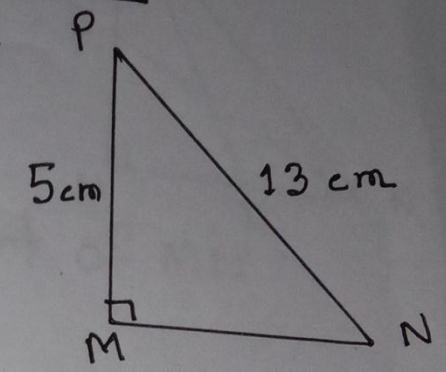
Which one of the following is the lowest value of $\frac{x^2-7x+12}{x^2-9x+20}$?

a) $\frac{x-3}{x-5}$ b) $\frac{x-1}{x-5}$ c) $\frac{x-2}{x-3}$ d) $\frac{x-2}{x-5}$

Geometry- Pythagorean Theorem

Ans to the question - 1 (a)

By phythagoras theorem



In $\triangle PMN$,

$PM^2 + MN^2 = PN^2$

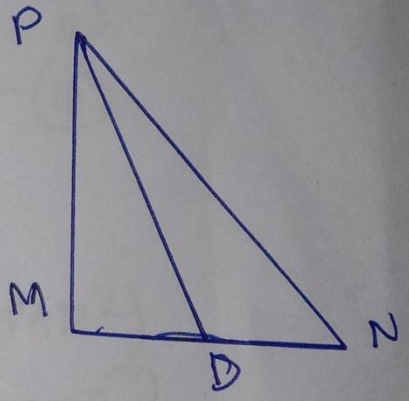
or, $5^2 + MN^2 = 13^2$

or, $25 + MN^2 = 169$

or, $MN = \sqrt{169 - 25}$

$\therefore MN = 12$ (Ans)

Ans to the Q.NO- 1 (b)



D is the mid point of MN.

It is to proved that

$PN^2 = PD^2 + 3DN^2$

In $\triangle PMD$, $\angle PMD = 90^\circ$

$\therefore PD^2 = PM^2 + MD^2$ ——— (i)

Now, In $\triangle PMN$

$PN^2 = PM^2 + MN^2$

or, $PN^2 = PD^2 - MD^2 + (2MD)^2$ [D is the mid point]

or $PN^2 = PD^2 - MD^2 + 4MD^2$

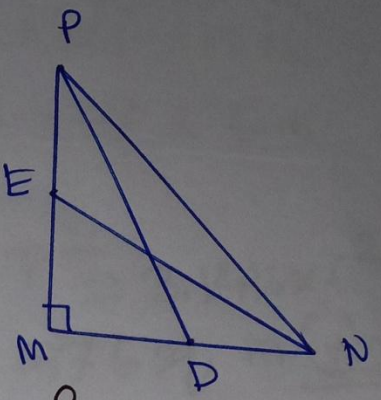
or, $PN^2 = PD^2 + 3MD^2$

or, $PN^2 = PD^2 + 3DN^2$ [MD = DN]

(proved)

Ans to the Q.NO. 9/C

D and E are the mid point of MN and PM respectively.



It is to prove that

$4(PD^2 + NE^2) = 5MN^2$

Proof:- D is the mid point of MN

$\therefore MD = \frac{MN}{2}$,

Similarly $EM = \frac{PM}{2}$

Now, In $\triangle PMN$, $PM^2 + MN^2 = PN^2$ ——— (i)

In $\triangle PMD$, $PD^2 = PM^2 + MD^2$ ——— (ii)

In $\triangle MEN$, $EN^2 = ME^2 + MN^2$ ——— (iii)

L.H.S $= 4(PD^2 + NE^2)$

$= 4\{PM^2 + MD^2 + ME^2 + MN^2\}$

$= 4\left\{PM^2 + MN^2 + \frac{MN^2}{4} + \frac{PM^2}{4}\right\}$

$= 4\left\{PN^2 + \frac{MN^2 + PM^2}{4}\right\}$

$= 4\left\{PN^2 + \frac{PN^2}{4}\right\}$

$= 4\left\{\frac{4PN^2 + PN^2}{4}\right\}$

$= 5PN^2 =$ R.H.S (proved)

Ans to the question No- 2 (a)

The diameter of the garden (d) = 12 m

So, the radius (r) = $\frac{d}{2} = \frac{12}{2} = 6$ m

We know,

Area of circle = $\pi \cdot r^2 = 3.1416 \times 6^2$

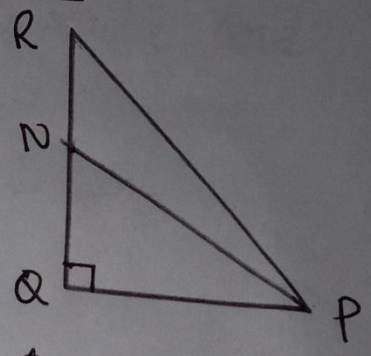
$= 113.0976$ sq m (Ans)

Ans to the Q. No. 2/b

Similar to the proof of pythagoras theorem in chapter 9 of your text book (Article - 9.2)

Ans to the Q.NO - 2 (c)

Given, $\triangle PQR$, $\angle Q = 90^\circ$
N is a point on QR. Let's Join PN. it is to prove that $PR^2 + QN^2 = PN^2 + QR^2$



Proof:- In $\triangle PQR$, $\angle RQP = 90^\circ$

$\therefore PR^2 = RQ^2 + PQ^2$ [According to pythagoras] ——— (i)

Now, In $\triangle PQN$, $\angle NQP = 90^\circ$

$\therefore PN^2 = QN^2 + PQ^2$ ——— (ii) or, $QN^2 = PN^2 - PQ^2$ ——— (ii)

Adding (i) and (ii) we get

$PR^2 + QN^2 = QR^2 + PQ^2 + PN^2 - PQ^2$

or, $PR^2 + QN^2 = PN^2 + QR^2$ [Proved]

Ans to the Question NO- 3 (a)

Given, three sides of a triangle are 6 cm, 8cm, 10 cm. Let us take the square of two smaller sides.

$$6^2+8^2$$
$$= 36+64$$
$$= 100$$
$$= 10^2$$

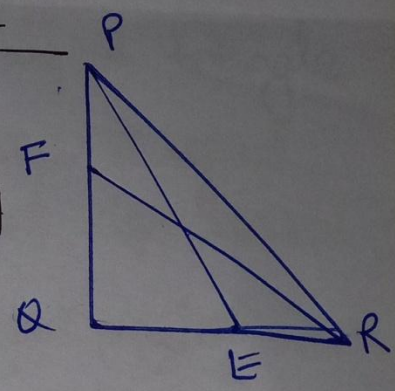
Whic is equal to the square of larger side, so, its a right angled triangle.

Ans to the Q-NO- 3(b)

Similar to the proof of pythagoras theorem of your text book, page-152

P.T.O

Ans to the Q.NO 3/c



Let, in $\triangle PQR$, $\angle PQR = 90^\circ$
PE and RE be the two medians of the triangle. It is to prove that

$5PR^2 = 4(PE^2 + RF^2)$

Proof:- In $\triangle PQR$, $PQ^2 + QR^2 = PR^2$ ——— (i)

In $\triangle PQE$, $PE^2 = PQ^2 + QE^2$ —— (ii)

In, $\triangle FQR$, $RF^2 = RQ^2 + FQ^2$ —— (iii)

Adding equation (ii) and (iii)

$$PE^2 + RF^2 = PQ^2 + QE^2 + RQ^2 + FQ^2$$

$$= (PQ^2 + RQ^2) + \left(\frac{QR}{2}\right)^2 + \left(\frac{PQ}{2}\right)^2$$

$$PE^2 + RF^2 = PR^2 + \frac{QR^2}{4} + \frac{PQ^2}{4}$$

$$PE^2 + RF^2 = \frac{4PR^2 + (PQ^2 + QR^2)}{4}$$

$$(PE^2 + RF^2) = \frac{4PR^2 + PR^2}{4}$$

$$\Rightarrow 4(PE^2 + RF^2) = 5PR^2$$

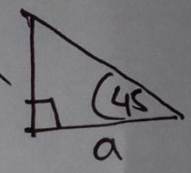
$$\therefore 5PR^2 = 4(PE^2 + RF^2)$$ [Proved]

Ans to the Q. NO -4 (a)

Two characteristics of a right angled triangle

(i) The square of the hypotenuse is equal to the seem of the square of ther two sides

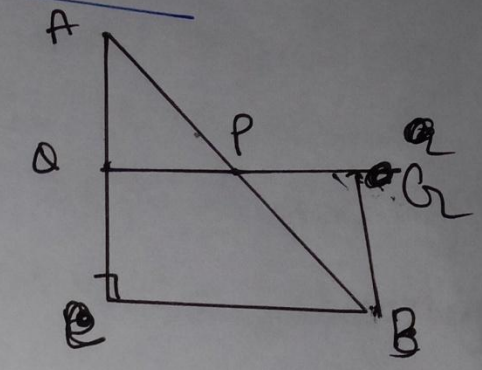
(ii) If any angle of the right angled triangle is equal to 45°, than base = perpendicular



Ans to the Q-NO - 4 (b)

Similar to the proof of pythagoras theorem of your text book. page-152

Ans to the Q. NO-4 (c)



Join QP and produced upto R, so that PQ = PR, Join BR.

H is to prove that

$PQ \parallel BC$ and $PQ = \frac{1}{2}BC$

Proof:- In $\triangle APQ$ and $\triangle BRP$

$AP = BP$ [P is the mid point]

$PQ = PR$ [According to construction]

$\angle APQ = \angle BPR$ [vertically]

$\therefore \triangle APQ \cong \triangle BRP$ [SAS]

$\therefore AQ = BR$

$CQ = BR$ [$AQ = CQ$]

$\therefore CQ \parallel BR$

$\therefore BCQR$ is a parelellogram

$\therefore QR \parallel BC$

$\Rightarrow QR = BC$

or, $PQ + PR = BC$

$\Rightarrow PQ + PQ = BC$

$\Rightarrow 2PQ = BC$

$\rightarrow PQ = \frac{1}{2}BC$

(proved)

Ans to the Q.NO 5/a

Given, two adjacent sides of a right angled triangle are 5 cm and 6 cm respectively Let us assume the base is 6 cm and Perpendicular is 5 cm which is also height.

The area of triangle $= \frac{1}{2} \times$ base $\times$ height

$= \frac{1}{2} \times 5 \times 6$

$= 15$ sq cm (Ans)

Ans to Q.NO- 5/b

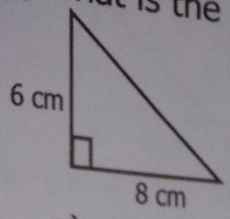
Similar to the converse pythagoras theorem of your text book →

Ans to. QN 5/c

Follow Q.NO - 1/c

MCQs

1. What is the area of the triangle in cm^2 ?



a) 12
b) 24
c) 36
d) 48

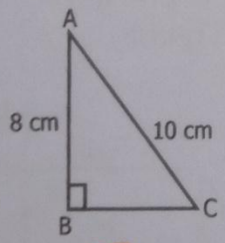
2. By which of the following length right angle triangle can be drawn?

a) 4, 5, 6
b) 6, 8, 10
c) 7, 9, 11
d) 5, 10, 15

3. If the difference of the two acute angles of a right angled triangle is 25°, then what is the value of the smallest angle in degree?

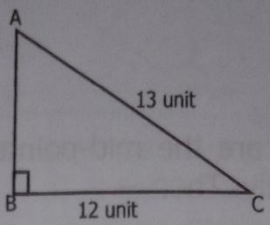
a) 65
b) 57.5
c) 32.5
d) 45

4. In the figure BC = ?



a) 6 cm
b) 12 cm
c) 13 cm
d) 14 cm

5.



What is the area of ΔABC in sq. unit?

a) 156
b) 78
c) 60
d) 30

6. Three sides are given. In which case of the following a triangle is possible to draw?

a) 4 cm, 7 cm, and 13 cm
b) 3 cm, 5 cm, and 8 cm
c) 3 cm, 6 cm, and 10 cm
d) 6 cm, 8 cm, and 10 cm

7. What is the length of the diagonal of a square with one side is 1 unit?

a) unit
b) 1.41 unit
c) 2.01 unit
d) 4.00 unit

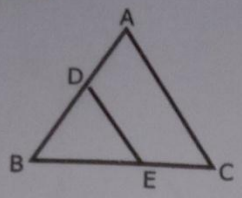
8. Which of the following measurement of sides is possible to draw a right angle triangle?

a) 3, 4, 5
b) 4, 4, 5
c) 6, 7, 8
d) 1, 6, 7

9. If the base of a triangle is 18 cm and the area is 108 sq. cm, what will be the height?

a) 3 cm
b) 6 cm
c) 12 cm
d) 24 cm

10.



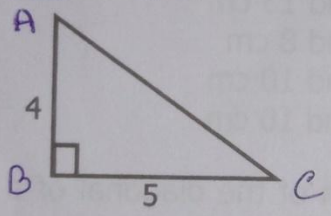
In the figure, D and E are the mid-points of AB and BC respectively. Then --

i. DE ll AC
ii. DE = $^1/_2$ AC
iii. BD = BE

Which of the following is correct?

a) i & ii
b) i & iii
c) ii & iii
d) i, ii & iii

11. In ΔABC --

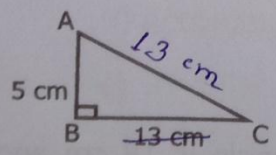


i. Area = 10 sq. unit
ii. AC = $\sqrt{41}$ unit
iii. $AB^2 = AC^2 + BC^2$

Which one is correct?

a) i and ii
b) i and iii
c) ii and iii
d) i, ii and iii

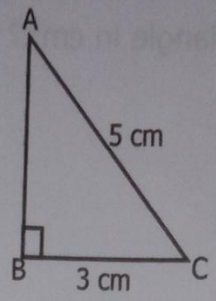
12.



What is the length of the side BC in cm?

a) 8
b) 12
c) 18
d) 144

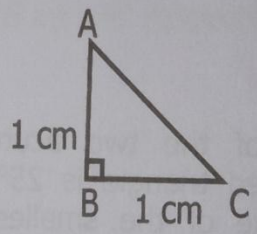
13.



In figure, what is the value of AB?

a) 2 cm
b) 3 cm
c) 4 cm
d) 8 cm

14.



In the above figure --

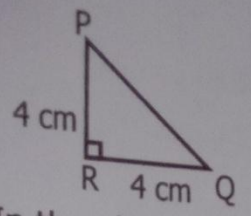
i. $\angle A = 45°$
ii. AC = $\sqrt{2}$ cm
iii. Area of ΔABC is 1 sq. cm.

Which one of the following is correct?

a) i & ii
b) ii & iii
c) i & iii
d) i, ii & iii

a)

15.



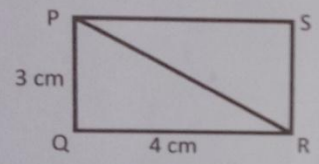
In the above figure --

i. $\angle PQR = 45°$
ii. $PQ = 4\sqrt{2}$ cm
iii. The area of ΔPQR is 16 sq. cm.

Which one is correct?

b) i and ii
c) i and iii
d) ii and iii
e) i, ii and iii

16.



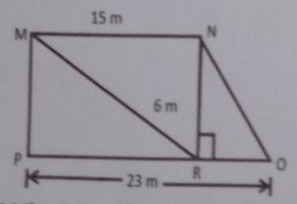
In figure PQRS is a rectangle, its --

i. Length of diagonal is 5 cm
ii. Area is 12 sq. cm
iii. Perimeter is 14 cm

Which one is correct?

a) i and ii
b) i and iii
c) ii and iii
d) i, ii and iii

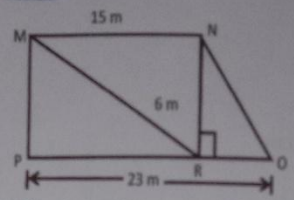
17.



What is the length of ON?

a) 9 m
b) 10 m
c) 14 m
d) 17 m

18.



What is the area of MNOP?

a) 44 sq. metres
b) 76 sq. metres
c) 114 sq. metres
d) 228 sq. metres

19. If BC is hypotenuse of triangle ABC

i. $\angle A$ = right angle
ii. $\angle B$ and $\angle C$ are acute angle
iii. $\angle B + \angle C = 90°$

Which of the following is correct?

a) i & ii
b) i & iii
c) ii & iii
d) i, ii & iii

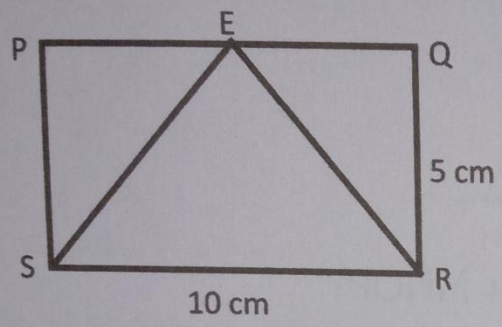
20. If the length of the side of a square is 4 metres, then its --

i. Area = 16 sq. metres
ii. Length of the diagonal = 8 metres
iii. Perimeter = 16 metres

Which of the following is correct?

a) i and ii
b) i and iii
c) ii and iii
d) i, ii and iii

21.



In the figure, PQRS is rectangular. If E is the mid-point of PQ --

i. $\Delta PES \cong \Delta QER$

ii. Rectangular PQRS = 2 ΔESR

iii. ΔESR = 25 sq. metre

Which of the following is correct?

a) i and ii
b) i and iii
c) ii and iii
d) i, ii and iii