MODEL KEY ANSWER

STATE LEVEL SSLC PREPARATORY EXAMINATION, FEBRUARY-2020

18-Feb-20

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1. 2
2. 3
3. $x = \frac{-b\pm\sqrt{b^2-4c}}{2}$
4. $\frac{5}{3}$
5. 1
6. 1:16
7. $\frac{\pi r^\circ}{4}$ sq units.
8. $\frac{2}{3}\pi r^3+\frac{1}{3}\pi r^2 h$
9. P=4
10. $a_{12}=38$.
11. $\frac{9}{2}$
12. 1
13. BC=$15\sqrt{3}$ m.
14. 12 cm.
15. One
16. $\pi l(R+r)+\pi R^2+\pi r^2$.
17. 3x+2y=11--------------→ (1)

    5x-2y=13 -----------→ (2)

    By using elimination method we get x=3 & y=1
18. 3, 7, 11, 15, ……………..

    Here a=3 & d=4 n=20 we have to find the value of S_{20}.

    $S_{20}=\frac{n}{2}(2a+(n-1)d)$

    $S_{20}=820$
19. $2x^2+x+4=0$

    Here a=2, b=1 & c=4

    $\Delta=b^2-4ac$

    $\Delta=-31$

    Hence the negative value is <0

    There is no real roots
20. The two points are (8, 3) & (2, 11)

    The distance formula is d=$\sqrt{(x2-x1)^2+(y2-y1)^2}$

    d=$\sqrt{100}$

    distance is 10 units
21. Total number of bulbs in the box =28

    Number of bulbs those are defective =7

Number of bulbs that are non-defective =28-7=21

Probability of the picking non defective one $=\frac{21}{28}$

$=\frac{3}{4}$

22. To prove : $CA^2=CB \times CD$

Given: triangle ABC, ∟ADC=∟BAC

Proof: in the figure

∟BAC=∟ADC (given)

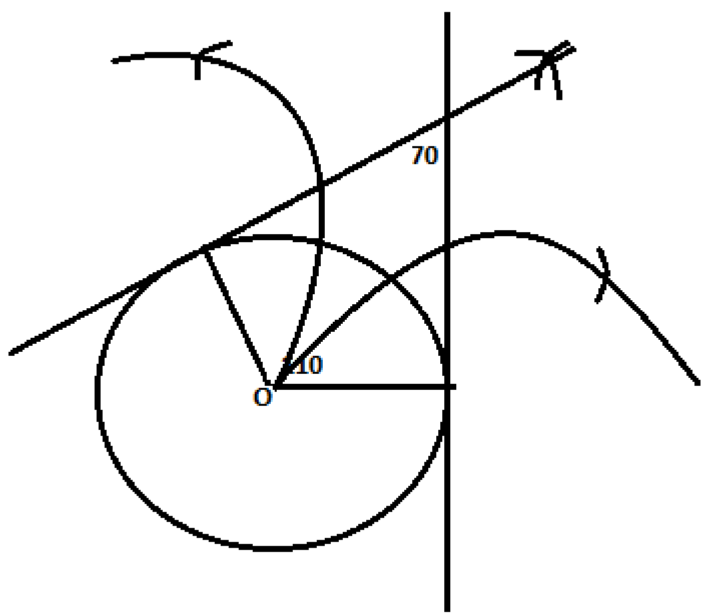
∟ACB=∟DCA (common angle)

There fore ΔABC≅ΔADC

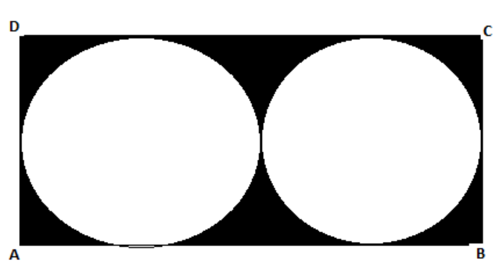
$\frac{CA}{CD}=\frac{CB}{CA}$

$CA^2=CB \times CD$

23.



24. Here rectangle of length is given AB=28cm & breadth BC=14cm



If the length is 28 cm then half it is 14 that is diameter of the circle d=14cm.

Then radius of any one circle is equal to the 7cm,

Therefore area of the rectangle = lxb

=28x14

=392cm^2.

Area of the 2 circles = 2x πr^2.

= 308 cm^2.

Therefore area of the shaded region = area of the rectangle- Area of the 2 circles

= 392-308

=84 cm^2.

OR

Area of the circle when radius is 5cm = πr^2.

= 78.57 cm^2.

Area of the right angled triangle when base 6cm and height is 8cm = $\frac{1}{2}$ x 6 x8

= 24 cm^2.

Therefore, the area of the shaded region = Area of the circle - Area of the right angled triangle

= 78.57-24

= 54.57 cm^2.

25. Let us assume that $\sqrt{3}$ is a ration number.

$\sqrt{3} = \frac{p}{q}$, p , q $\dot{\in}$ z, q ≠0, HCF of (p. q) =1

Squaring on both side we get

3= $\frac{p}{q}$

P^2 & q^2 are not co-prime numbers.

This is contradictory to our assumptions that p & q are co-prime is wrong.

Therefore $\sqrt{3}$ is an irrational number.

OR

HCF of 135 & 75 is

75)135(1
75
60)75(1
60
15)60(4
60 therefore HCF of 135 & 75 is 15.

LCM of 135, 75 & 20 is 60.

26. If two zeroes of the polynomial is 3 & -3

We can take this as (x-3)(x+3)

By multiplying we get x^2+0x-9.

$x^2+0x-9)x^3+2x^2-9x-18(x+2$

$\underline{x^3+0x^2-9x}$

$2x^2+0x-18$

$\underline{2x^2+0x-18}$

0

So another zero of the polynomial is -2.

OR

$g(x)(3x-5)+9x+10= 3x^3+x^2+2x+5$

$g(x)(3x-5)= 3x^3+x^2-7x-5$

therefore $g(x)= \dfrac{3x^3+x^2-7x-5}{3x-5}$

$g(x)= x^2+2x+1$.

27. $\dfrac{\cos\theta}{1-\tan\theta} + \dfrac{\sin\theta}{1-\cot\theta} =\sin\theta+ \cos\theta$

$\dfrac{\cos\theta}{1-\frac{\sin\theta}{\cos\theta}} + \dfrac{\sin\theta}{1-\frac{\cos\theta}{\sin\theta}}$

$\dfrac{\text{Sin}^2\theta}{\text{Cos}\,\theta-\sin\theta} + \dfrac{\cos^2\theta}{\sin\theta-\cos\theta}$

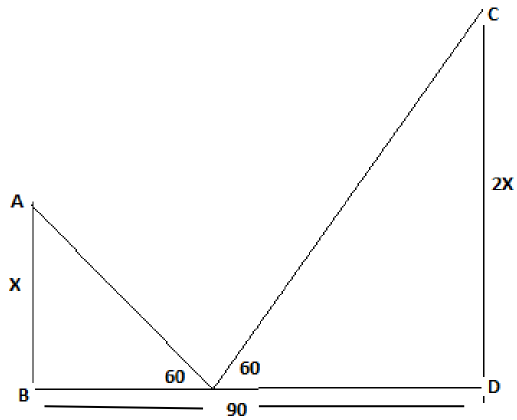
$\dfrac{\text{Sin}^2\theta}{\text{Cos}\,\theta-\sin\theta} - \dfrac{\cos^2\theta}{\cos\theta-\sin\theta}$

$\dfrac{\text{Sin}^2\theta - \cos^2\theta}{\cos\theta-\sin\theta}$

$\dfrac{(\sin\theta+\cos\theta)(\sin\theta-\cos\theta)}{\cos\theta-\sin\theta}$

$= (\sin\theta+\cos\theta)$

28. Let AB be the small pole and CD be the big pole either side of the road of distance 90 feet as shown in figure.



In triangle ABO

Tan $\theta = \frac{AB}{BO}$

Tan 60= $\frac{AB}{90-d}$

$\sqrt{3} = \frac{x}{90-d}$

AB= $\sqrt{3}$ (90-d) ------→1

Similarly apply tanθ to the triangle ODC

We get tan 60=$\frac{DC}{d}$

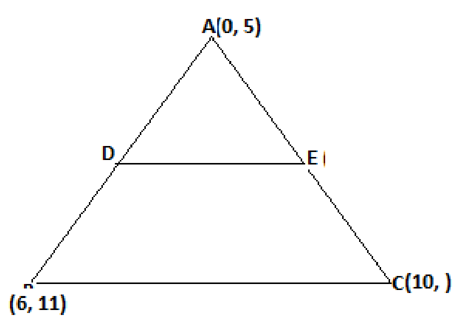
$\sqrt{3} = \frac{DC}{d}$ ---------→2

From 1 & 2

BO=30m

Therefore AB=30$\sqrt{3}$ & DC= 60$\sqrt{3}$

29. By using section formula at point D we get



$(\frac{0+6}{2}, \frac{5+11}{2})$
= (3, 8)
By using same at E we get
$(\frac{0+10}{2}, \frac{5+7}{2})$
= (5, 6)
In triangle ADE,
A(0, 5) , B(3, 8) & C(5, 6).
Area of the Triangle ADE= $\frac{1}{2}$($x_1(y_2-y_3)$+x2(y_3-y_1)+x3(y_1-y_2)).
Therefore area of the triangle = -6 or 6 sq units.

30. We have to find median for the data
Median =LRL+($\frac{n}{2}$-fc)/f x h

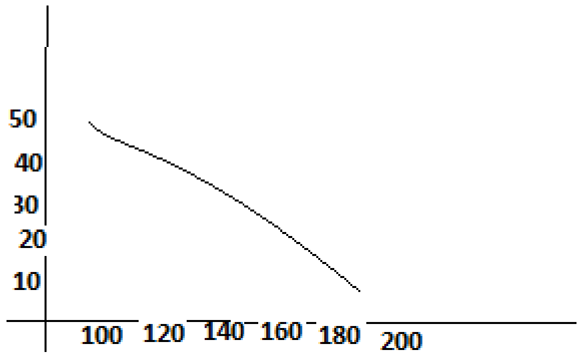
C.I	f	fc
50-60	12	12
60-70	14	26
70-80	8	34
80-90	6	40
90-100	10	50
	n=50	

n/2=25, LRL=60, f=14 , fc=12 & h=10
median = 60+ 65/7
= 60+9.28
= 69.28

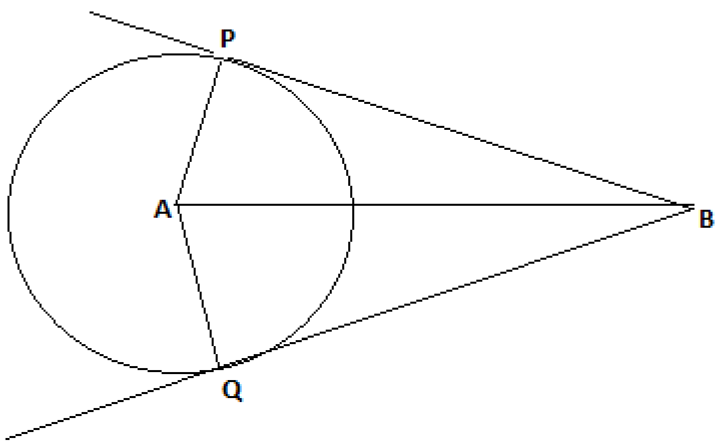
31. More than ogive

C.I	f	fc	Coordinates
100-120	5	50	(100, 50)
120-140	10	45	(120, 45)
140-160	20	35	(140, 35)
160-180	5	15	(160, 15)
180-200	10	10	(180, 10)
	N=50		

Scale : along x axis 1cm=20 units
Along y axis 1cm =10 units

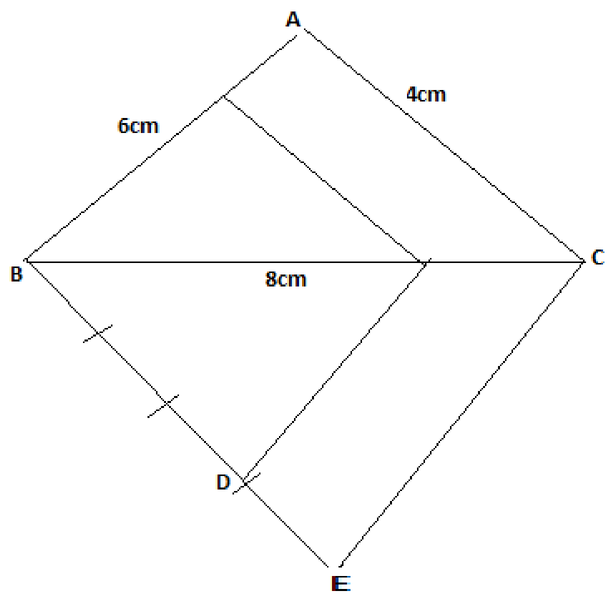


32. Data : A is the centre of the circle B is an external point
BP & BQ are the tangents
AP, AQ & AB are joined
To prove : BP= BQ



Proof: in triangle APB & triangle AQB
AP=AQ
∟P=∟Q=90^0.
Hyp AB= Hyp AB
ΔAPB≅AQB
Therefore PB=QB

33. Similar triangle



34. Let The first term of two AP's is a

Their common difference be d_1 & d_2.

The ratios of their common difference be 1:2

This can be written as $\frac{d1}{d2} = \frac{1}{2}$

$d_2=2d_1$.

For first AP

$a_7= a+6d_1=23$

For 2^{nd} AP

$a_{21}=a+20d_2=125$

by solving the above two equations we get $d_1=3$ & $d_2=6$.

Therefore

For first AP, 5, 8, 11, …….

For 2^{nd} AP, 5, 11, 17……….

35. Let the books purchased by sanvi be x

Cost of the every book be $\frac{120}{x}$

If she purchased 3 more books, then it will be x+3

Cost of the every books after this we get $\frac{120}{x+3}$

According to problem

$$\frac{120}{x} - \frac{120}{x+3} = 2$$

After solving we get the equation like $2x^2+6x- 360=0$

By solving this we get x=12 & x=-15 but we take the positive value
Hence cost of every book =120/12=Rs.10
And she purchased the 12 books.

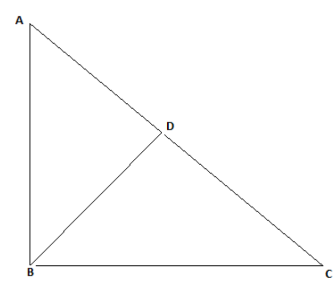
OR

Let the speed of the motor boat in still water = x km/hr.
Speed of the stream is 5km/hr
The time taken by the motor boat downstream = $\frac{30}{x+5}$
The time taken by the motor boat upstream = $\frac{30}{x-5}$
Total time taken by the boat = 4 and half hour means $4\frac{1}{2}$ hours. = $\frac{9}{2}$
according to problem

$$\frac{30}{x+5}+\frac{30}{x-5}=\frac{9}{2}$$

After simplifying we get the quadratic equation $9x^2-120x-225=0$
Therefore we get $x=15$ or $x=-\frac{5}{3}$
Speed of the motor boat in still water will be 15km/hr.

36.



"in a right angled triangle, the square of the hypotenuse is equal to the sum of the square of the other two sides".
Data: in triangle ABC, $\angle ABC=90^0$.
To prove : $AB^2+BC^2=AC^2$.
Construction : draw BD $\perp$AC
Proof : compare ΔABC & ΔADB, $\angle B=\angle D=90^0$. (Data & construction)
BAD is common
Therefore $\Delta ABC \cong \Delta ADB$
$\frac{AB}{AD}=\frac{AC}{AB}$ ------------→ $AB^2=AC.AD$ -------. (1)
compare ΔABC & ΔCDB, $\angle B=\angle D=90^0$. (Data & construction)
ACB is common
Therefore $\Delta ABC \cong \Delta ADB$

$\frac{BC}{DC} = \frac{AC}{BC}$ ------------→ $BC^2 = AC.DC$ -------. (2) By adding 1 & 2

$AB^2+BC^2 = AC.AD + AC.DC$

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

Hence the proof.

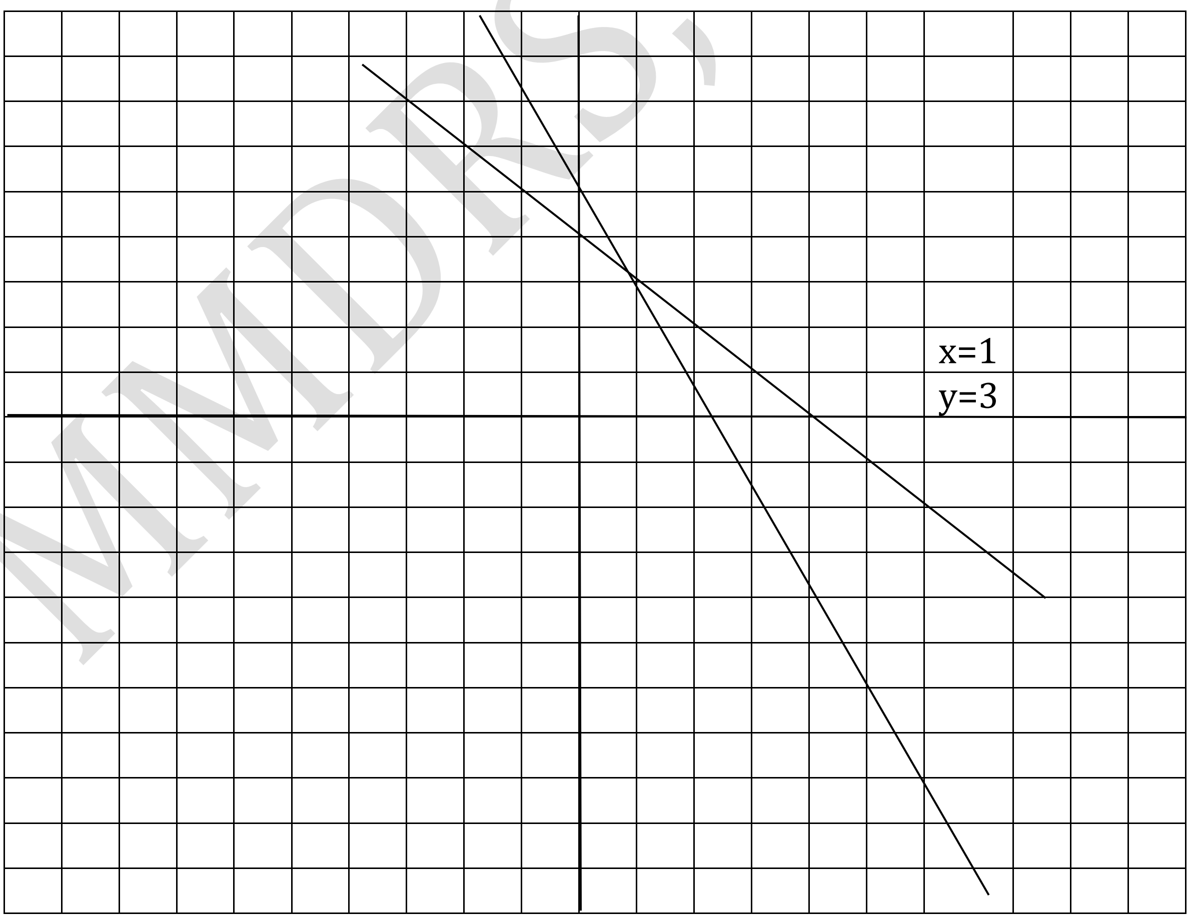
37. The pair of lin.equations are

$2x+y=5$

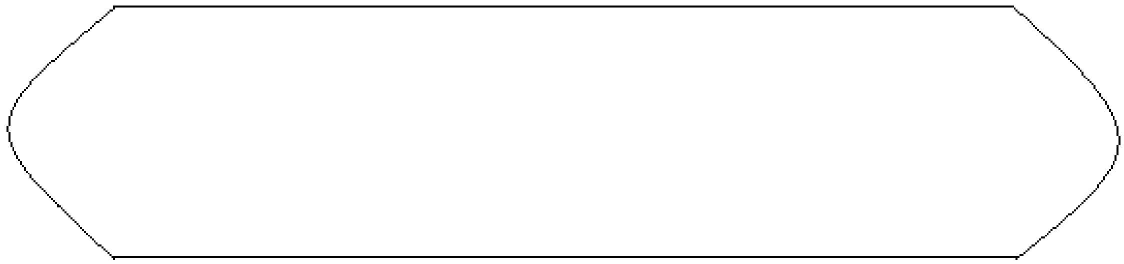
x	0	2.5
y	5	0

& $x+y= 4$

x	0	4
y	4	0



38. For cylinder , r= 0.6cm & h=3cm



Volume of the cylinder = $\pi r^2 h$.

= 3.14x0.6x0.6x3

= 3.394 m^3.

Volume of the 2 hemispherical bowl= $2x \frac{2}{3} \pi r^3$.

= 0.905 m^3.

Quantity of the tank = 3.394 + 0.905

= 4.299

Volume of the container = $\pi r^2 h$. (this is what people have)

= 693000 cm^3.

Convert this into m3 we get = 0.693 m^3.

For 60 peoples = 60x0.693

= 4.158 m^3.

The quantity of the water left in the tanker after distribution is

= 4.299- 4.158

= 0.141m^3.

= 141 litres.