**Solution**

**Class 10 - Mathematics**

**2020-2021 - Paper-7**

**Part-A**

1. We know that HCF of two numbers is a divisor of their LCM. Here, 18 is not a divisor of 380.
   But 380 = 18×21+2
   Here 2 is remainder so 380 is not divisible by 18.
   So, 18 and 380 cannot be respectively HCF and LCM of two numbers.

   OR

   Since the decimal expansion is non-terminating but recurring, the given number is a rational number of the form $\frac{p}{q}$ and q is not of the form $2^m \times 5^n$ that is, the prime factors of q will also have a factor other than 2 and 5.
2. Given, $2x^2 - 2\sqrt{2}x + 1 = 0$
   Here, a = 2, b = $-2\sqrt{2}$, c = 1.
   So, $b^2 - 4ac = 8 - 8 = 0$
   Therefore, x = $\frac{2\sqrt{2} \pm \sqrt{0}}{4} = \frac{\sqrt{2}}{2} \pm 0$ i.e., $x = \frac{1}{\sqrt{2}}$
   So, the roots are $\frac{1}{\sqrt{2}}, \frac{1}{\sqrt{2}}$
3. The given pair of linear equations
   x - 2y - 8 = 0
   and 5x - 10y - c = 0
   On Comparing with ax + by + c = 0;
   Here, $a_1 = 1$, $b_1 = -2$, $c_1 = -8$;
   And $a_2 = 5$, $b_2 = -10$, $c_2 = -c$;
   $a_1/a_2 = 1/5$
   $b_1/b_2 = 1/5$
   $c_1/c_2 = 8/c$
   But if c = 40 (real value), then the ratio $c_1/c_2$ becomes 1/5 and then the system of linear equations has an infinitely many solutions.
   Hence, at c= 40, the system of linear equations does not have a unique solution.
4. ∵ BD is a diameter
   $\therefore \angle BCD = 90^o$ [Angle in the semi-circle]
   $\therefore \angle BCP = 180^o - 90^o - 40^o = 50^o$
5. Here,
   $a_n = n^2 + 1$
   So, $a_1 = 1^2 + 1 = 2$
   $a_2 = 2^2 + 1 = 5$
   $a_3 = 3^2 + 1 = 10$
   List of numbers becomes 2, 5, 10,.......
   Here, 5 – 2 ≠ 10–5, so it does not form an A.P.

   OR

   0.6, 1.7, 2.8, 3.9...
   First term = a= 0.6
   Common difference (d) = Second term -First term
   = Third term - Second term and so on
   Therefore, Common difference (d) = 1.7−0.6=1.1

6. $\frac{1}{3}, \frac{5}{3}, \frac{9}{3}, \frac{13}{3}, \ldots\ldots$
   First term (a) $= \frac{1}{3}$
   Common difference (d) $= \frac{5}{3} - \frac{1}{3} = \frac{4}{3}$
7. Given $(x + 4)^2 - 8x = 0$

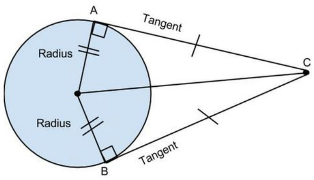
   $\Rightarrow x^2 + 8x + 16 - 8x = 0$

   $\therefore x^2 + 16 = 0$

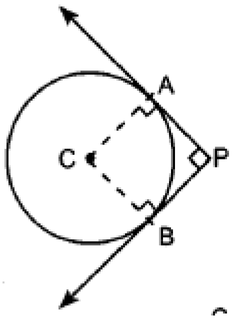
   $\therefore D = b^2 - 4ac = (0) - 4(1)(16) < 0$

   Hence, the equation $(x + 4)^2 - 8x = 0$ has no real roots.

OR

   We have given that $x^2 + 4x + 5 = 0$. Here, a = 1, b = 4, c = 5. So, $b^2 - 4ac = 16 - 20 = -4 < 0$.
   Since the square of a real number cannot be negative, therefore $\sqrt{b^2 - 4ac}$ will not have any real value. So, there are no real roots for the given equation.
8. 


   Consider C is an external point as shown in figure.
   According to theorem, from an external point only two tangents can be drawn to a circle.
   So, value of k = 2
9. PA and PB are two tangents drawn from an external point P to a circle.




   $CA \perp AP$
   $CB \perp BP$
   $PA \perp PB$
   $\therefore$ BPAC is a square.
   $\Rightarrow AP = PB = BC = 4cm$

OR

   Given , A line touches a circle of radius 4 cm.
   Distance between two parallel tangents = Diameter of the circle = $2 \times 4$ = 8 cm.
10. $\triangle AHK \sim \Delta ABC$
   $\Rightarrow \frac{AK}{AC} = \frac{HK}{BC}$
   $\Rightarrow \frac{10}{x} = \frac{7}{3.5}$, when AC = x cm
   $\Rightarrow \quad x = \frac{10 \times 3.5}{7} = 5$
   $\therefore$ AC = 5 cm.
11. We have $a_1 = -1$ , $a_2 = -1$, $a_3 = -1$ and $a_4 = -1$

   $a_2 - a_1 = 0$

   $a_3 - a_2 = 0$

   $a_4 - a_3 = 0$

   Clearly, the difference of successive terms is same, therefore given list of numbers form an AP.
12. We have $\frac{\tan 26^\circ}{\cot 64^\circ}$

   by using $\tan(90^o - A) = \cot A$, we get

$= \frac{\tan(90^\circ - 64^\circ)}{\cot 64^\circ}$
$= \frac{\cot 64^\circ}{\cot 64^\circ}$
= 1

13. $\tan A = \frac{3}{4}$ and $A + B = 90^\circ \Rightarrow B = 90^\circ - A$
$\therefore \cot B = \cot(90^\circ - A) = \tan A$
$= \frac{3}{4}$
14. Edge of the cube = 4.2 cm
Diameter of base of cone=4.2 cm
Radius = $\frac{4.2}{2}$ = 2.1 cm
15. Given AP: 75, 67, 59, 51,...
Common difference = 67 - 75 = -8
5th term = 51 - 8 = 43
6th term = 43 - 8 = 35
16. After removing king, queen and jack of clubs from a deck of 52 playing cards there are 49 cards left in the deck. Out of these 49 cards one card can be chosen in 49 ways.
$\therefore$ Total number of elementary events = 49
There are 13 heart cards in the deck containing 49 cards out of which one heart card can be chose in 13 ways.
$\therefore$ Favourable number of elementary events = 13
Hence, P (Getting a heart) = $\frac{13}{49}$

OR

No, the outcomes are not equally likely, because 3 contains half part of the total region, so it is more likely than 1 and 2, since 1 and 2, each contains half part of the remaining part of the region.
17. i. (d) The perpendiculars from P, Q, R and S intersect the x-axis at 3, 10, 10 and 3 respectively.
Also, the perpendiculars from P, Q, R and S intersect the y-axis at 6, 6, 2, 2 respectively.
Hence coordinates of P and S are: P(3, 6) and S(3, 2).
ii. (b) Let M be the mid-point of QS.
So using mid-point formula, Coordinates of M are $\left(\frac{3+10}{2}, \frac{2+6}{2}\right)$ = $\left(\frac{13}{2}, 4\right)$
iii. (a) Now, PQ $= \sqrt{(10-3)^2 + (6-6)^2} = \sqrt{49} = 7 \text{ m}$
PS $= \sqrt{(3-3)^2 + (2-6)^2} = \sqrt{16} = 4 \text{ m}$
Hence, area of rectangle PQRS = PQ $\times$ PS = 7 $\times$ 4 = 28 $m^2$
iv. (c) R(10, 2), Q(10, 6)
v. (b) 7, 4
18. i. (c) $90^0$
ii. (b) SAS
iii. (b) 4:9
iv. (d) Converse of Pythagoras theorem
v. (a) 48 $cm^2$
19. i. (a) 46-48
ii. (b) 46.9 kg
iii. (a) Mean
iv. (c) 45.85
v. (b) 14K
20. i. (a) 196.25 $cm^3$
ii. (b) 32.71 $cm^3$
iii. (c) 163.54 $cm^3$
iv. (b) 9.81 $cm^3$
v. (d) 186.44 $cm^3$

**Part-B**

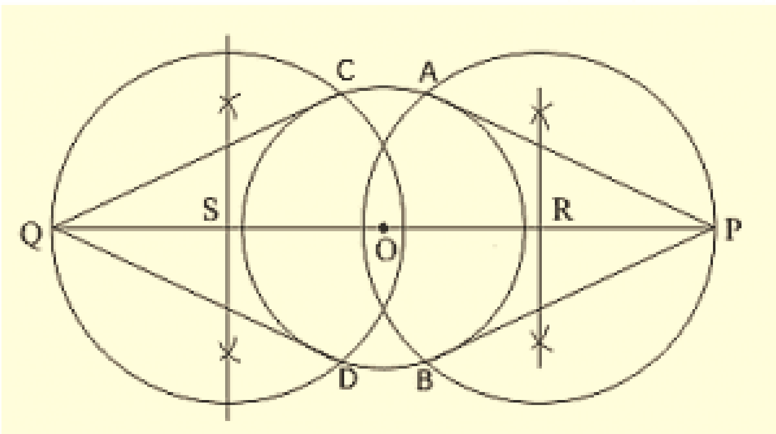
21. Let us assume, to the contrary, that $3\sqrt{2}$ is rational.
That is, we can find coprimes a and b (b ≠ 0) such that $3\sqrt{2} = \frac{a}{b}$
Rearranging, we get $\sqrt{2} = \frac{a}{3b}$ ...(i)
Since 3, a and b are integers, $\frac{a}{3b}$ is rational, and so (i) shows that $\sqrt{2}$ is rational.
But this contradicts the fact that $\sqrt{2}$ is irrational.
So, we conclude that $3\sqrt{2}$ is irrational.

22. Since (a, b) is the mid-point of the line segment A(10, -6) and B(k, 4),
$a = \frac{10+k}{2}$ and b = $\frac{-6+4}{2}$
$\Rightarrow$ 2a = 10 + k and $b = \frac{-2}{2}$
$\Rightarrow$ k = 2a - 10 and b = -1
Now, a - 2b = 18
$\Rightarrow$ a - 2(-1) = 18
$\Rightarrow$ a + 2 = 18
$\Rightarrow$ a = 16
Hence,
k = 2×16 - 10 = 32 -10 = 22
$\therefore AB = \sqrt{(22-10)^2 + (4+6)^2} = \sqrt{12^2 + 10^2} = \sqrt{144 + 100} = \sqrt{244} = 2\sqrt{61}$ units

OR

It is given that P (x,y) is equidistant from A(3, 6) and B(-3, 4).
Using Distance formula, we can write
PA = PB
$\sqrt{(x-3)^2 + (y-6)^2} = \sqrt{[x-(-3)]^2 + (y-4)^2}$
$\Rightarrow \sqrt{x^2 + 9 - 6x + y^2 + 36 - 12y} = \sqrt{x^2 + 9 + 6x + y^2 + 16 - 8y}$
Squaring both sides, we get
$\Rightarrow x^2 + 9 - 6x + y^2 + 36 - 12y = x^2 + 9 + 6x + y^2 + 16 - 8y$
$\Rightarrow -6x - 12y + 45 = 6x - 8y + 25$
$\Rightarrow 12x + 4y = 20$
$\Rightarrow 3x + y = 5$

23. The quadratic equation is given as: $4u^2 + 8u$
it can be written in the standard form as:
$= 4u^2 + 8u + 0$
$= 4u (u + 2)$
The value of $4u^2 + 8u$ is zero when 4u = 0 or u + 2 = 0,
i.e., u = 0 or u = −2
Therefore, the zeroes of $4u^2 + 8u$ are 0 and −2
Sum of zeroes = $0 + (-2) = -2 = \frac{-(8)}{4} = \frac{-(\text{ coefficient of } u)}{\text{coefficient of } u^2}$
Product of zeroes = $0 \times (-2) = 0 = \frac{0}{4} = \frac{\text{constant torm}}{\text{coefficient of } u^2}$
Hence verified

24. 

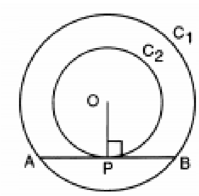
**Steps of construction:**

**(i)** Draw a line segment PQ of 14 cm.
**(ii)** Take the midpoint O of PQ.
**(iii)** Draw the perpendicular bisectors of PO and OQ which intersects at points R and S.
**(iv)** With center R and radius RP draw a circle.
**(v)** With center S and radius, SQ draw a circle.
**(vi)** With center O and radius 3 cm draw another circle which intersects the previous circles at the points A, B, C, and D.
**(vii)** Join PA, PB, QC, and QD.
So, PA, PB, QC, and QD are the required tangents.

25. $\sin 60^\circ \cos 30^\circ + \sin 30^\circ \cos 60^\circ$
$= \frac{\sqrt{3}}{2} \cdot \frac{\sqrt{3}}{2} + \frac{1}{2} \cdot \frac{1}{2}$
$= \frac{3}{4} + \frac{1}{4} = 1$

OR

LHS
$= \frac{\sin\theta - 2\sin^3\theta}{2\cos^2\theta - \cos\theta} = \frac{\sin\theta(1-2\sin^2\theta)}{\cos\theta(2\cos^2\theta-1)}$
$= \frac{\sin\theta(\cos^2\theta + \sin^2\theta - 2\sin^2\theta)}{\cos\theta(2\cos^2\theta - \cos^2\theta - \sin^2\theta)} \quad \because \cos^2\theta + \sin^2\theta = 1$
$= \frac{\sin\theta(\cos^2\theta - \sin^2\theta)}{\cos\theta(\cos^2\theta - \sin^2\theta)} = \tan\theta$
= RHS

26. 


In larger circle C1 , AB is the chord and OP is the tangent.
Therefore, $\angle OPB = 90^\circ$
Hence, AP = PB ( perpendicular from center of the circle to the chord bisects the chord)

27. We can prove $7\sqrt{5}$ irrational by contradiction.
Let us suppose that $7\sqrt{5}$ is rational.
It means we have some co-prime integers *a* and *b* (*b*≠ 0)
such that
$7\sqrt{5} = \frac{a}{b}$
$\Rightarrow \sqrt{5} = \frac{a}{7b}$ .......(1)
R.H.S of (1) is rational but we know that $\sqrt{5}$ is irrational.
It is not possible which means our supposition is wrong.
Therefore, $7\sqrt{5}$ cannot be rational.
Hence, it is irrational.

28. Let the two consecutive odd positive integers be 'x' & 'x + 2'.
According to the question :-
$x^2 + (x + 2)^2 = 290$
$\Rightarrow 2x^2 + 4x + 4 = 290$
$\Rightarrow 2x^2 + 4x - 286 = 0$
$\Rightarrow x^2 + 2x - 143 = 0$
$\Rightarrow x^2 + 13x - 11x - 143 = 0$
$\Rightarrow x(x + 13) - 11(x + 13) = 0$
$\Rightarrow (x + 13)(x - 11) = 0$
$\Rightarrow x - 11 = 0$ [$\because x > 0 \therefore x + 13 \neq 0$]
$\Rightarrow x = 11$ & so, $x + 2 = 13$
Hence, required consecutive odd positive integers are 11 and 13.

OR

Let the base of the right triangle be x cm.
Then altitude = (x - 7) cm
Hypotenuse = 13 cm
By Pythagoras theorem
$(\text{Base})^2 + (\text{Altitude})^2 = (\text{Hypotenuse})^2$

$\implies x^2 + (x-7)^2 = (13)^2$

$\implies x^2 + x^2 - 14x + 49 = 169$

$\implies 2x^2 - 14x - 120 = 0$

$\implies 2(x^2 - 7x - 60) = 0$ or $x^2 - 7x - 60 = 0$

$\implies x^2 - 12x + 5x - 60 = 0$

$\implies x(x - 12) + 5(x - 12) = 0$

$\implies (x + 5)(x - 12) = 0$

Either x + 5 = 0 or x - 12 = 0

$\implies x = -5, 12$

Since side of the triangle cannot be negative. So, x =12 cm and x = - 5 is rejected.
Hence, length of the other two sides are 12cm, (12 - 7) = 5cm.

29. $7y^2 - \frac{11}{3}y - \frac{2}{3}$

$= \frac{1}{3}(21y^2 - 11y - 2)$

$= \frac{1}{3}(21y^2 - 14y + 3y - 2)$

$= \frac{1}{3}[7y(3y - 2) + 1(3y - 2)]$

$= \frac{1}{3}(3y - 2)(7y + 1)$

$\Rightarrow y = \frac{2}{3}, \frac{-1}{7}$ are zeroes of the polynomial.

If Given polynimoal is $7y^2 - \frac{11}{3}y - \frac{2}{3}$

Then a = 7 , b = $-\frac{11}{3}$ and c = $-\frac{2}{3}$

Sum of zeroes = $\frac{2}{3} + \frac{-1}{7} = \frac{14-3}{21} = \frac{11}{21}$ ........ (i)

Also, $\frac{-b}{a} = \frac{-\left(\frac{-11}{3}\right)}{7} = \frac{11}{21}$ ........ (ii)

From (i) and (ii)

Sum of zeroes = $\frac{-b}{a}$

Now, product of zeroes = $\frac{2}{3} \times \frac{-1}{7} = \frac{-2}{21}$ ....... (iii)

Also, $\frac{c}{a} = \frac{\frac{-2}{3}}{7} = \frac{-2}{21}$ ......... (iv)

From (iii) and (iv)

Product of zeroes = $\frac{c}{a}$

30. We know that, the sum of three angles of a triangle is $180^\circ$.

In $\triangle$PQR, $\angle P + \angle Q + \angle R = 180^\circ$

$\Rightarrow 55^\circ + 25^\circ + \angle R = 180^\circ$

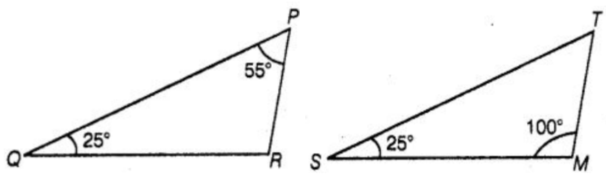
$\Rightarrow \angle R = 180^\circ - (55^\circ + 25^\circ) = 180^\circ - 80^\circ = 100^\circ$

In $\triangle$TSM, $\angle T + \angle S + \angle M = 180^\circ$

$\Rightarrow \angle T + \angle 25^\circ + 1000^\circ = 180^\circ$

$\Rightarrow \angle T = 180^\circ - (25^\circ + 100^\circ)$

$= 180^\circ - 125^\circ = 55^\circ$




In $\triangle$PQR and $\triangle$TSM, we have

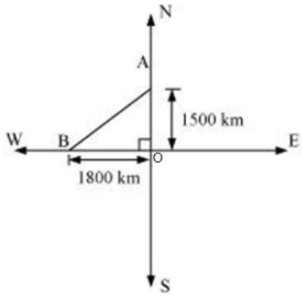
$\angle$P = $\angle$T, $\angle$Q = $\angle$S,

and $\angle$R = $\angle$M

Therefore, $\triangle$PQR ~ $\triangle$TSM [since, all corresponding angles are equal]

Hence, $\triangle$QPR is not similar to $\triangle$TSM, since correct correspondence is P $\leftrightarrow$ T, Q < r $\leftrightarrow$ S and R $\leftrightarrow$ M.

OR




Distance traveled by the plane flying toward north in $1\frac{1}{2}$hrs

$= 1{,}000 \times 1\frac{1}{2} = 1{,}500km$

Similarly, distance traveled by the plane flying towards west in $1\frac{1}{2}$hrs

$= 1{,}200 \times 1\frac{1}{2} = 1{,}800km$

Let these distances are represented by OA and OB respectively.

Now applying Pythagoras theorem

Distance between these planes after $1\frac{1}{2}$hrs $AB = \sqrt{OA^2 + OB^2}$

$= \sqrt{(1{,}500)^2 + (1{,}800)^2} = \sqrt{2250000 + 3240000}$

$= \sqrt{5490000} = \sqrt{9 \times 610000} = 300\sqrt{61}$

So, distance between these planes will be $300\sqrt{61}$km, after $1\frac{1}{2}$hrs.

31. According to the question, A child’s game has 8 triangles of which 3 are blue and rest are red, and 10 squares of which 6 are blue and rest are red.

Total number of pieces $= 8 + 10 = 18$

i. No. of triangles = 8.

Hence, P(triangle is lost) = $\frac{8}{18} = \frac{4}{9}$

ii. No. of squares = 10

Hence, P(square is lost) = $\frac{10}{18} = \frac{5}{9}$

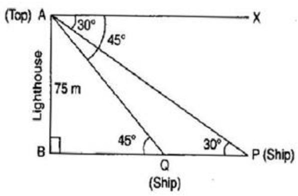
iii. No. of squares of blue colour = 6.

So, P(square of blue colour is lost) = $\frac{6}{18} = \frac{1}{3}$

iv. No. of triangles of red colour $= 8 - 3 = 5$

So, P(triangle of red colour is lost) = $\frac{5}{18}$

32. In right triangle ABQ,




$\tan 45^\circ = \frac{AB}{BQ}$

$\Rightarrow 1 = \frac{75}{\text{BQ}}$

$\Rightarrow$BQ = 75 m ........ (i)

In right triangle ABP,

$\tan 30^\circ = \frac{AB}{BP}$

$\Rightarrow \frac{1}{\sqrt{3}} = \frac{AB}{BQ+QP}$

$\Rightarrow \frac{1}{\sqrt{3}} = \frac{AB}{75+QP}$ [From eq. (i)]

$\Rightarrow$ 75 + QP = $75\sqrt{3}$

QP = $75(\sqrt{3}-1)$ m

Hence the distance between the two ships is $75(\sqrt{3}-1)$ m.

33. We first find the class mark $x_i$, of each class and then proceed as follows

| Weight (in kg) | Number of wrestles ($f_i$) | Class Marks ($x_i$) | Deviation $d_i = x_i - a$ | $f_i d_i$ |
|---|---|---|---|---|
| 100-110 | 4 | 105 | -20 | -80 |
| 110-120 | 14 | 115 | -10 | -140 |
| 120-130 | 21 | a=125 | 0 | 0 |
| 130-140 | 8 | 135 | 10 | 80 |
| 140-150 | 3 | 145 | 20 | 60 |
| | | $N=\sum f_i = 50$ | | $\sum f_i d_i = -80$ |

∴ Assumed mean, (a) = 125

Class width, (h) = 10

and total observations, (N) = 50

By step deviation method,

Mean $(\bar{x}) = a + \frac{\sum f_d d}{\sum f_i}$

Mean $(\bar{x}) = 125 + \frac{(-80)}{50}$

= 125 - 16

= 123.4kg

Hence, mean weight of wrestlers = 123.4kg

34. ∠C = 3 ∠B = 2(∠A + ∠B)

Taking 3 ∠B = 2(∠A + ∠B)

⇒ ∠B = 2 ∠A

⇒ 2 ∠A - ∠B = 0 ........ (1)

We know that the sum of the measures of all angles of a triangle is 180°.

∠A + ∠B + ∠C = 180°

⇒ ∠A + ∠B + 3∠B = 180°

⇒∠A + 4 ∠B = 180° ................ (2)

Multiplying equation (1) by 4, we obtain:

8 ∠A - 4 ∠B = 0 ...... (3)

Adding equations (2) and (3), we get

9 ∠A = 180°

⇒∠A = 20°

From eq. (2), we get,

20° + 4 ∠B = 180°

⇒ ∠B = 40°

And ∠C = 3 x 40°= 120°

Hence the measures of ∠A, ∠B and ∠C are 20°, 40° and 120° respectively.

OR

i. By Elimination method

   The given system of equation is

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

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

   Multiplying equation (2) by 2, we get

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

   Adding equation(1) and equation (2), we get

   $\frac{5}{2}x = 5 \Rightarrow x = \frac{5\times 2}{5} \Rightarrow \quad x = 2$

   Substituting this value of x in equation(2), we get

   $2 - \frac{y}{3} = 3 \Rightarrow \frac{y}{3} = 2 - 3 = -1 \Rightarrow \quad y = -3$

So, the solution of the given system of equation is

x = 2, y = -3

ii. By substitution method

The given system of equation is

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

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

From equation (2),

$x=\frac{y}{3}+3$....................(3)

Substituting this value of x in (1),

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

$\Rightarrow \quad \frac{y}{6}+\frac{3}{2}+\frac{2y}{3}=-1 \Rightarrow \quad \frac{5y}{6}=-1-\frac{3}{2}$

$\Rightarrow \quad \frac{5y}{6}--\frac{5}{2} \Rightarrow y=-3$

Substituting this value of y in equation (3), we get

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

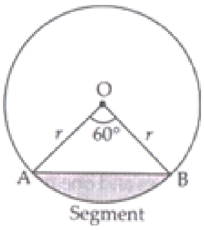
So, the solution of the given system of equations is x = 2, y = -3

Verification: Substituting x = 2, y = -3, we find that both the equation (1) and (2) are satisfied as shown below:

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

35. Area of minor segment = Area of sector – Area of $\triangle$OAB

In $\triangle$OAB,




$\theta$ = 60°

OA = OB = r = 12 cm

$\angle$B = $\angle$A = x [$\angle$s opp. to equal sides are equal]

$\Rightarrow$ $\angle$A + $\angle$B + $\angle$O = 180°

$\Rightarrow$ x + x + 60° = 180°

$\Rightarrow$ 2x = 180° – 60°

$\Rightarrow$ x = $\frac{120^{\circ}}{2}$ = 60°

$\therefore$ $\triangle$OAB is equilateral $\triangle$ with each side (a) = 12 cm

Area of the equilateral $\triangle=\frac{\sqrt{3}}{4}a^2$

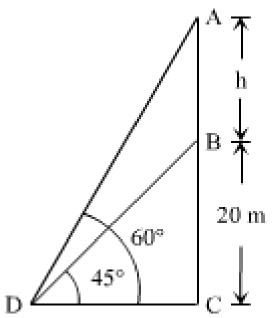
Area of minor segment = Area of the sector – Area of $\triangle$OAB

$=\frac{\pi r^2\theta}{360^{\circ}}-\frac{\sqrt{3}}{4}a^2$

$=\frac{3.14\times12\times12\times60^{\circ}}{360^{\circ}}-\frac{\sqrt{3}}{4}\times12\times12$

= 6.28 $\times$ 12 – $36\sqrt{3}$

$\therefore$ Area of minor segment = (75.36 – $36\sqrt{3}$) $cm^2$.

36. 


Let BC be the building, AB be the transmission tower, and D be the point on the ground.

In ΔBCD,
$\frac{BC}{CD} = tan45^{o}$
$\Rightarrow \frac{20}{CD} = 1$
$\Rightarrow CD = 20$
In ΔACD,
$\frac{AC}{CD} = tan60^{o}$
$\Rightarrow \frac{AB+BC}{CD} = \sqrt{3}$
$\Rightarrow \frac{AB+20}{20} = \sqrt{3}$
$\Rightarrow AB + 20 = 20\sqrt{3}$
$\Rightarrow AB = 20(\sqrt{3} - 1)\ m.$