Solution

PRE BOARD EXAM - II (2025-26)

Class 10 - Mathematics

Section A

1.

(b) 0

Explanation:

$1080 = 2^3 \times 3^3 \times 5$

On comparing

x = 3, y = 3

x - y = 3 - 3 = 0

2.

(d) $-\frac{3}{4}, \frac{3}{4}$

Explanation:

$16x^2 - 9 = 0$

(4x - 3)(4x + 3) = 0

$\therefore$ x = $\pm\frac{3}{4}$

3. **(a)** $10x^2 - x - 3$

Explanation:

$\alpha + \beta = \left(\frac{3}{5} - \frac{1}{2}\right) = \frac{1}{10}, \alpha\beta = \frac{3}{5} \times \left(\frac{-1}{2}\right) = \frac{-3}{10}$

Required polynomial is $x^2 - \frac{1}{10}x - \frac{3}{10}$, i.e., $10x^2 - x - 3$

4. **(a)** 18 sq. units

Explanation:

The triangle formed by the lines y = x, x = 6 and y = 0 is shaded.

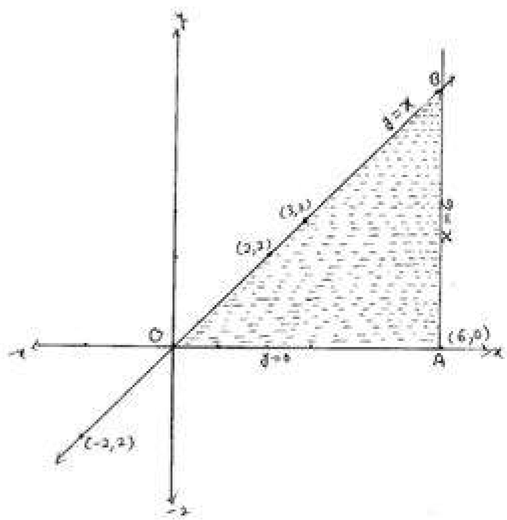
The area of the shaded region, i.e., $x = y$

We got a right-angled triangle with base 6 units and height 6 units

Triangle OAB = $\frac{1}{2} \times$ OA $\times$ AB

Hence the area of triangle = $\frac{1}{2} \times 6 \times 6$ = 18 sq.units

x	2	-2	3
y	2	-2	3



5.

(b) $\frac{b^2}{4a}$

Explanation:

Since the roots are equal, we have D = 0

$\therefore b^2 - 4ac = 0 \Rightarrow 4ac = b^2 \Rightarrow c = \frac{b^2}{4a}$.

6.

(d) n^2

Explanation:

1, 3, 5, 7, ... are n odd numbers

Where a = 1, and d = 2

$\therefore S_n = \frac{n}{2}[2a + (n-1)d]$

= $\frac{n}{2}[2 \times 1 + (n-1) \times 2]$

$\frac{n}{2}[2 + 2n - 2]$ = $\frac{n}{2} \times 2n$

= n^2

7.

(b) 5

Explanation:

a_n = 5n - 1

a_4 = 5(1) - 1

= 5 - 1

= 4

a_2 = 5(2) - 1

= 10 - 1

= 9

$\therefore$ d = a_2 - a_4

= 9 - 4

= 5

8.

(d) $\angle$B = $\angle$P

Explanation:

$\angle$B = $\angle$P

9.

(d) 5 units

Explanation:

A(2,-1) B(-1,-5)

$AB = \sqrt{(2+1)^2 + (-1+5)^2}$

$= \sqrt{3^2 + 4^2}$

$= \sqrt{9 + 16}$

$= \sqrt{25}$

AB = 5 units

10.

(d) 20°

Explanation:

$2\cos 3\theta = 1 \Rightarrow \cos 3\theta = \frac{1}{2} = \cos 60^\circ \quad \Rightarrow 3\theta = 60^\circ \Rightarrow \theta = 20^\circ$

11.

(d) $\frac{60}{\pi}$ cm

Explanation:

Given: Length of arc = 20 cm

$\Rightarrow \frac{\theta}{360^{\circ}} \times 2\pi$r= 20

$\Rightarrow \frac{60^{\circ}}{360^{\circ}} \times 2\pi$r= 20

$\Rightarrow \frac{\pi r}{3}$ = 20

$\Rightarrow r\left(\frac{\pi}{3}\right)$ = 20

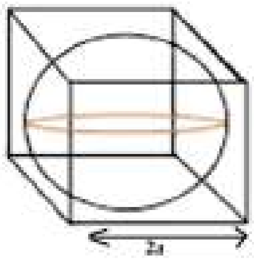
$\Rightarrow r\left(\frac{\pi}{3}\right)$ = 20

$\Rightarrow$ r = $\frac{60}{\pi}$ cm

12.

(d) $\frac{4}{3}\pi$a^3

Explanation:



$\because$ Spherical ball is inside the cubical box.

$\therefore$ diameter = 2a.

radius = a

Volume of sphere = $\frac{4}{3}\pi r^3$

Volume of sphere = $\frac{4}{3}\pi r^3$ cubic units.

13.

(c) mode

Explanation:

The most frequent value in the data is known as the Mode. e.g let us consider the following data set: 3,5,7,5,9,5,8,4 the mode is 5 since it occurs most often in data set.

14. **(a)** $\overline{x}$ + a

Explanation:

Let terms be x_1, x_2, x_3, ..., x_n

$\therefore$ Mean $(\overline{x})$ = $\frac{x_1+x_2+x_3+............+x_n}{n}$

New observations are x_1 + a,x_2 + a,x_3 + a, ..., x_n + a

$\therefore$ New Mean = $\frac{x_1+a+x_2+a+x_3+a+............+x_n+a}{n}$

= $\frac{x_1+x_2+x_3+............+x_n+na}{n}$

= $\overline{x}+a$

15.

(d) $\frac{9}{25}$

Explanation:

A number is selected from the numbers 1 to 25

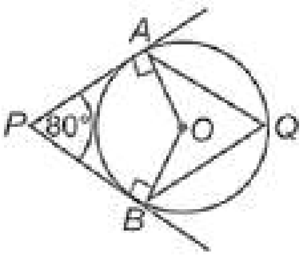
Probability of prime number which are 2, 3, 5, 7, 11, 13, 17, 19, 23 = 9

$\therefore \mathrm{P(E)} = \frac{m}{n} = \frac{9}{25}$

16.

(d) 50^{o}

Explanation:



Since, PA and PB are tangents.
Also, tangent is perpendicular to radius at the point of contact.

$\therefore \angle PAO = 90^o$ and $\angle PBO = 90^o$

In quadrilateral APBO;

$\angle APB + \angle PAO + \angle PBO + \angle AOB = 360^o$

$80^o + 90^o + 90^o + \angle AOB = 360^o$

$\Rightarrow \angle AOB = 100^o \Rightarrow \angle AQB = \frac{1}{2}\angle AOB = 50^o$

17.

(c) 15 cm

Explanation:

Let PQ be the tangent.
Since OP is perpendicular to PQ, then $\angle OPQ = 90°$
Now, in right-angled triangle OPQ,

$OQ^2 = OP^2 + PQ^2$

$\Rightarrow (17)^2 = (8)^2 + PQ^2$

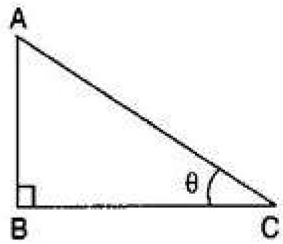
$\Rightarrow PQ^2 = 289 - 64$

$\Rightarrow PQ^2 = 225$

$\Rightarrow PQ = 15$ cm

18. **(a)** 60°

Explanation:



Let the height of the pole AB = 60 m, the length of the shadow BC = $20\sqrt{3}$ m
and angle of elevation be θ

$\therefore \tan\theta = \frac{\text{AB}}{\text{BC}}$

$\Rightarrow \tan\theta = \frac{60}{20\sqrt{3}}$

$\Rightarrow \tan\theta = \frac{3}{\sqrt{3}} \times \frac{\sqrt{3}}{\sqrt{3}}$

$\Rightarrow \tan\theta = \sqrt{3}$

$\Rightarrow \tan\theta = \tan 60^\circ$

$\Rightarrow \theta = 60^\circ$

19.

(b) Both A and R are true but R is not the correct explanation of A.

Explanation:

For assertion, given equation has no solution if
$\frac{1}{2} = \frac{1}{k} \neq \frac{-4}{-3}$ i.e. $\frac{4}{3}$

k = 2 $\left[\frac{1}{2} \neq \frac{4}{3} \text{ holds}\right]$

Assertion is true. Reason does not give the result of assertion.

20.

(d) A is false but R is true.

Explanation:

A is false but R is true.

Section B

21. We have, (k- 12)x^2 + 2(k - 12)x + 2 = 0.

a = k - 12,b = 2(k - 12) and c = 2.

The given equation will have equal roots, if

$\therefore$ D = b^2 - 4ac = 0

$\Rightarrow$ 4$(k - 12)^2$ - 4 (k - 12)$\times$ 2 = 0

$\Rightarrow$4(k- 12) [(k - 12) - 2] = 0

$\Rightarrow$4(k - 12)(k - 14) = 0

$\Rightarrow$4(k - 12) (k - 14) = 0 $\Rightarrow$ k - 12 = 0 or, k - 14 = 0 $\Rightarrow$ k = 12 or, k = 14

OR

Given, $3x^2 + 5\sqrt{5}x - 10 = 0$

By splitting the middle term, we have

$3x^2 + 6\sqrt{5}x - \sqrt{5}x - 10 = 0$

$\Rightarrow 3x(x + 2\sqrt{5}) - \sqrt{5}(x + 2\sqrt{5}) = 0$

$\Rightarrow (3x - \sqrt{5})(x + 2\sqrt{5}) = 0$

$\therefore 3x - \sqrt{5} = 0$ or $x + 2\sqrt{5} = 0$

$\therefore$ x = $\frac{\sqrt{5}}{3}$ or x = $-2\sqrt{5}$

22. At mid-point of AB = $\left(\frac{\frac{x}{2}+x+1}{2}\right) = 5$

or, x = 6

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

or, y + 1 + 2y - 6 = -8

y = -1

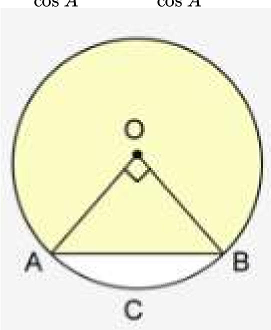
23. $LHS = \frac{\cos A}{1+\sin A} + \frac{1+\sin A}{\cos A}$

$= \frac{\cos^2 A+(1+\sin A)^2}{(1+\sin A)\cos A} = \frac{\cos^2 A+1+\sin^2 A+2\sin A}{(1+\sin A)\cos A}$

$= \frac{1+1+2\sin A}{(1+\sin A)\cos A} \because \sin^2 A + \cos^2 A = 1$

$= \frac{2+2\sin A}{(1+\sin A)\cos A} = \frac{2(1+\sin A)}{(1+\sin A)\cos A}$

$= \frac{2}{\cos A} = 2 \cdot \frac{1}{\cos A} = 2\sec A = RHS$

24. 

Let O be the centre of the circle and AB be the chord.

Now, Area of the minor segment $= Area\ of\ the\ sector\ OACBO - Area\ of\ \triangle AOB$

$= 3.14 \times 10 \times 10 \times \frac{90}{360} - \frac{1}{2} \times 10 \times 10$

$= 78.5 - 50$
$= 28.5 cm^2$

OR

Here, r = 14 cm and $\theta = \frac{90^\circ}{3} = 30^\circ$
$\therefore$Area swept = $\frac{\theta}{360^\circ} \times \pi r^2$
=$\frac{30^\circ}{360^\circ} \times \frac{22}{7} \times 14 \times 14$
= $\frac{154}{3}$ cm^2

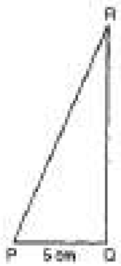
25. If two cubes are joined end to end, we get a cuboid such that
l = Length of the resulting cuboid = 10 cm +10 cm = 20 cm
b = Breadth of the resulting cuboid = 10 cm
h = Height of the resulting cuboid = 10 cm
$\therefore$ Surface area of the cuboid = 2 (lb + bh + Ih)
$\Rightarrow$ Surface area of the cuboid = $2(20 \times 10 + 10 \times 10 + 20 \times 10)\text{cm}^2$ = 1000 cm^2

Section C

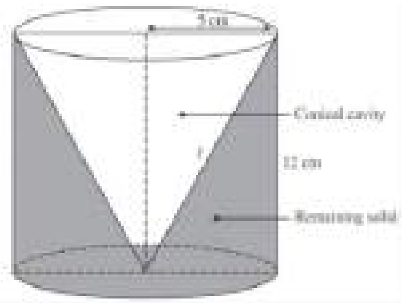
26. Let p(x) = $6x^2$ - 3 - 7x
For zeroes of p(x),
p(x) = 0
$\Rightarrow$ $6x^2$ - 3 - 7x = 0
$\Rightarrow$ $6x^2$ - 7x - 3 = 0
$\Rightarrow$ $6x^2$ - 9x + 2x - 3 = 0
$\Rightarrow$ 3x(2x - 3) + (2x - 3) = 0
$\Rightarrow$ (2x - 3) (3x + 1) = 0
$\Rightarrow$ 2x - 3 = 0 or 3x + 1 = 0
$\Rightarrow x = \frac{3}{2}$ or $x = -\frac{1}{3} \Rightarrow x = \frac{3}{2}, -\frac{1}{3}$
So, the zeroes of p(x) are $\frac{3}{2}$ and $-\frac{1}{3}$
We observe that Sum of its zeroes
$= \frac{3}{2} + \left(-\frac{1}{3}\right) = \frac{3}{2} - \frac{1}{3}$
= $\frac{9-2}{6} = \frac{7}{6} = \frac{-(-7)}{6} = -\frac{\text{Coefficient of } x}{\text{Coefficient of } x^2}$
Product of its zeroes = $\left(\frac{3}{2}\right) \times \left(-\frac{1}{3}\right)$
= -$\frac{1}{2} = -\frac{3}{6} = \frac{\text{Constant term}}{\text{Coefficient of x}^2}$

27. Let the digits at units and tens place of the given number be x and y respectively
Thus, the number is $10y + x$.
The sum of the two digits of the number is 9.
Thus, we have $x + y = 9$ .....(i)
After interchanging the digits, the number becomes $10x + y$.
Also, 9 times the number is equal to twice the number obtained by reversing the order of the digits.
Thus, we have
$9(10y + x) = 2(10x + y)$
$\Rightarrow 90y + 9x = 20x + 2y$
$\Rightarrow 20x + 2y - 90y - 9x = 0$
$\Rightarrow 11x - 88y = 0$
$\Rightarrow 11(x - 8y) = 0$
$\Rightarrow x - 8y = 0$ .....(ii)
So, we have the systems of equations
x + y = 9,
x - 8y = 0
Here x and y are unknowns.
Substituting $x = 8y$ from the second equation to the first equation, we get
$8y + y = 9$
$\Rightarrow 9y = 9$

$\Rightarrow y=\frac{9}{9}$
$\Rightarrow y=1$
Substituting the value of y in the second equation, we have
$x-8\times 1=0$
$\Rightarrow x-8=0$
$\Rightarrow x=8$
$\therefore$ the number is $10\times 1+8=18$

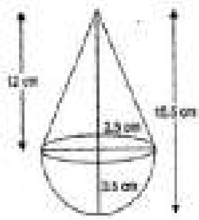
28. 

In $\triangle PQR$, by Pythagoras theorem
$PR^2 = PQ^2 + QR^2$
$\Rightarrow (25-QR)^2=5^2+QR^2 [\because PR+QR=25\text{ cm}\Rightarrow PR=25-\text{QR}]$
$625 - 50QR + QR^2 = 25 + QR^2$
$\Rightarrow 600-50QR=0$
$\Rightarrow QR=\frac{600}{50}=12\text{ cm}$
Now, PR + QR = 25 cm
$\Rightarrow$ PR = 25 - Q R = 25 - 12 = 13 cm
Hence, $\sin P=\frac{QR}{PR}=\frac{12}{13}, \cos P=\frac{PQ}{PR}=\frac{5}{13}$ and, $\tan P=\frac{QR}{PQ}=\frac{12}{5}$

29. 

Radius of common base = 5 cm
Height of cylinder = 12 cm
$l^2 = r^2 + h^2$
$\Rightarrow l^2 = 5^2 + 12^2$
$\Rightarrow l^2 = 25 + 144 = 169$
$\Rightarrow l=\sqrt{169}=13\text{cm}$
Whole surface area of remaining cylinder
$=2\pi rh+\pi r^2+\pi rl$
$=2\pi(5)(12)+\pi(5)^2+\pi(5)(13)=210\pi\ cm^2$
Volume of the remaining part of cylinder
=Volume of cylinder-volume of cone
$=\pi r^2h-\frac{1}{3}\pi r^2h$
$=\pi\times 5\times 5\times 12-\frac{1}{3}\pi\times 5\times 5\times 12$
$=\pi\times 5\times 5\times 12\left[1-\frac{1}{3}\right]$
$=\pi\times 5\times 5\times 12\times\frac{2}{3}$
$= 200\pi\text{ cm}^3$

OR



Radius of the cone = 3.5 cm

$\therefore$ Radius of the hemisphere = 3.5 cm

Total height of the toy = 15.5 cm

$\therefore$ Height of the cone = 15.5 - 3.5 = 12 cm

Slant height of the cone = $\sqrt{(3.5)^2 + (12)^2} = \sqrt{12.25 + 144}$

$= \sqrt{156.25}$ = 12.5 cm

$\therefore$ Total surface area of the toy = Curved surface area of hemisphere + Curved surface area of cone

$= 2\pi r^2 + \pi rl = 2\pi(3.5)^2 + \pi(3.5)(12.5)$

$= 24.5\pi + 43.75\pi = 68.25\pi = 68.25 \times \frac{22}{7}$ = 214.5 cm^2

30. The total number of marbles = 54.

As per given condition

P(getting a blue marble) = $\frac{1}{3}$ and P(getting a green marble) = $\frac{4}{9}$

Let P(getting a white marble) be x.

Since, there are only 3 types of marbles in the jar, the sum of probabilities of all three marbles must be 1.

Therefore, $\frac{1}{3}+\frac{4}{9}$+x=1

$\Rightarrow \frac{3+4}{9}$+x=1

$\Rightarrow \frac{7}{9}$+x=1

$\Rightarrow$ x = 1$-\frac{7}{9}$

$\Rightarrow$ x = $\frac{9-7}{9}$

$\Rightarrow$ x = $\frac{2}{9}$

Therefore, P(getting a white marble) = $\frac{2}{9}$ .... (1)

Let the number of white marbles be n.

Probability = $\frac{Number\, of\, favourable\, outcome}{Total\, Number\, of\, outcomes}$

Then, P(getting a white marbles) = $\frac{n}{54}$ .... (2)

From (1) and (2),

$\frac{n}{54} = \frac{2}{9}$

$\Rightarrow$ n = $\frac{2\times 54}{9}$

$\Rightarrow$ n = $\frac{108}{9}$

$\Rightarrow$ n = 12

Thus, there are 12 white marbles in the jar.

OR

We know that in a leap year there are 366 days and, 366 days = 52 weeks and two days.

Therefore, a leap year has always 52 Sundays.

Therefore,the remaining two days can be:

i. Sunday and Monday
ii. Monday and Tuesday
iii. Tuesday and Wednesday
iv. Wednesday and Thursday
v. Thursday and Friday
vi. Friday and Saturday
vii. Saturday and Sunday.

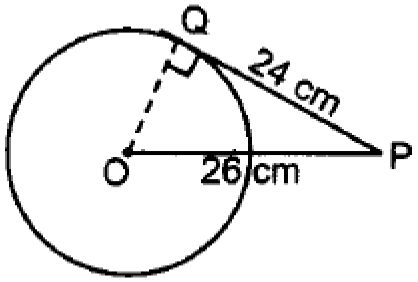
Therefore, From the above we observe that there are seven elementary events associated with this random experiment.

Let A be the event that a leap year has 53 Sundays.

Therefore, the event A will happen if the last two days of the leap year are either Sunday and Monday or Saturday and Sunday.

Therefore , favourable number of elementary events = 2

Therefore, required probability $= \frac{2}{7}$

31. 

According to the question, $OP = 26\ cm\ and\ PQ = 24\ cm$

In $\triangle$OQP, we have $\angle$Q = 90°

$\mathrm{OP}^2 = \mathrm{OQ}^2 + \mathrm{PQ}^2$

$\Rightarrow (26)^2 = \mathrm{OQ}^2 + (24)^2$

$\Rightarrow \mathrm{OQ}^2 = 676 - 576 = 100$

$\Rightarrow \quad OQ = 10\mathrm{cm}$

$\therefore$ Radius of the circle $= 10cm$

Section D

32. Given:-

Speed of boat =18 km/hr

Distance = 24 km

Let x be the speed of stream.

Let t_1 and t_2 be the time for upstream and downstream As we know that,

speed = $\frac{\text{distance}}{\text{time}}$

$\Rightarrow$ time = $\frac{\text{distance}}{\text{speed}}$

For upstream, Speed = (18 - x) km/hr

Distance =24 km

Time = t_1

Therefore,

$t_1 = \frac{24}{18-x}$

For downstream,

Speed = (18 + x) km/hr

Distance = 24 km

Time = t_2

Therefore,

$t_2 = \frac{24}{18+x}$

Now according to the question-

$t_1 = t_2 + 1$

$\frac{24}{18-x} = \frac{24}{18+x} + 1$

$\Rightarrow \frac{1}{18-x} - \frac{1}{18+x} = \frac{1}{24}$

$\Rightarrow \frac{(18+x)-(18-x)}{(18-x)(18+x)} = \frac{1}{24}$

$\Rightarrow$ 48x = (18 - x)(18 + x)

$\Rightarrow$ 48x = 324 + 18x - 18x - x^2

$\Rightarrow$ x^2 + 48x - 324 = 0

$\Rightarrow$ x^2 + 54x - 6x - 324 = 0

$\Rightarrow$ x(x + 54) -6(x + 54) = 0

$\Rightarrow$ (x + 54)(x - 6) = 0

$\Rightarrow$ x = -54 or x = 6

Since speed cannot be negative.

$\Rightarrow$ x $\neq$ -54

$\therefore$ x = 6

Thus the speed of stream is 6 km/hr.

Total time of Journey = $t_1 + t_2$

= $\frac{24}{18-x} + \frac{24}{18+x}$

= $\frac{24}{12} + \frac{24}{24}$ = 2 + 1 = 3 hrs.

OR

Let the average speed of truck be x km/h.

$\frac{150}{x} + \frac{200}{x+20} = 5$

or, 150x + 3000 + 200x = 5x(x + 20)

or, $x^2 - 50x - 600 = 0$

or, $x^2 - 60x + 10x - 600 = 0$

or, $x(x-60) + 10(x-60) = 0$

or, (x-60)(x + 10) = 0

or, x = 60 ; or x = -10

as, speed cannot be negative

Therefore, x=60 km/h

Hence, first speed of the truck = 60 km/h

33. $\Delta\text{PAC} \sim \Delta\text{QBC}$

$\therefore \frac{x}{y} = \frac{AC}{BC}$ or $\frac{y}{x} = \frac{BC}{AC}$ ...(i)

$\Delta\text{RCA} \sim \Delta\text{QBA}$

$\therefore \frac{z}{y} = \frac{AC}{AB}$ or $\frac{y}{z} = \frac{AB}{AC}$ ...(ii)

Adding (i) and (ii)

$\frac{y}{x} + \frac{y}{z} = \frac{BC+AB}{AC}$

$\Rightarrow \frac{1}{x} + \frac{1}{z} = \frac{1}{y}$

34.

Class	$\mathbf{x_i}$	$\mathbf{f_i}$	$\mathbf{u_i} = \frac{x_i - 57\cdot5}{5}$	$\mathbf{f_iu_i}$
40 - 45	42·5	5	-3	-15
45 - 50	47·5	11	-2	-22
50 - 55	52·5	20	-1	-20
55 - 60	57·5=a	24	0	0
60 - 65	62·5	28	1	28
65 - 70	67·5	12	2	24
		100		**-5**

Mean = $a + \frac{\sum f_i u_i}{\sum f_i} \times h$

= $57.5 + \frac{-5}{100} \times 5$ = 57.25

Mode = $l + \left(\frac{f_1 - f_0}{2f_1 - f_0 - f_2}\right) \times h$

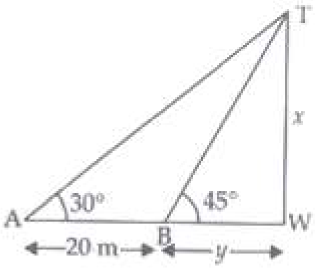
= $60 + \frac{28-24}{2(28)-24-12} \times 5$ = 61

35. Let the height of the vertical tower (TW) = x m

When a observer at A, makes angle of elevation at the top of tower is 30°.

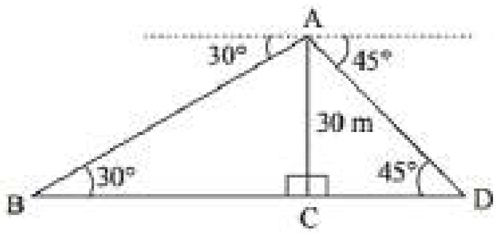
Now, angle of elevation of the top of tower is increased by 15° when observer moves 20m towards the tower.

i.e., it becomes 30° + 15° = 45°.



In $\triangle$TWB,
tan 45° $= \frac{P}{B} = \frac{x}{y}$
$\Rightarrow 1 = \frac{x}{y}$
$\Rightarrow$ x = y ......(i)
Now, $\triangle$TWA, we have
tan 30° $= \frac{P}{B} = \frac{x}{20+y}$
$\Rightarrow \frac{1}{\sqrt{3}} = \frac{x}{20+x}$ [From (i)]
$\Rightarrow \sqrt{3}x = 20 + x$
$\Rightarrow \sqrt{3}x - x = 20$
$\Rightarrow x(\sqrt{3} - 1) = 20$
$\Rightarrow x = \frac{20}{(\sqrt{3}-1)} \times \frac{\sqrt{3}+1}{(\sqrt{3}+1)}$
$\Rightarrow x = \frac{20(\sqrt{3}+1)}{3-1} = \frac{20(\sqrt{3}+1)}{2}$
$\Rightarrow x = 10(1.732 + 1)$
$\Rightarrow x = 10 \times 2.732 = 27.32m$
Hence, the height of the tower (TW) is 27.32 m.

OR



In $\triangle ABC$, $\frac{AC}{BC}$ = tan 30°
$\Rightarrow$ BC = $30\sqrt{3}$ m
In $\triangle ACD$, $\frac{AC}{CD}$ = tan 45°
$\Rightarrow$ CD = 30 m
Width of river = BD
= BC + CD
= $30(\sqrt{3}+1)$m = 30 $\times$ 2.73m = 81.9m

Section E

36. i. HCF (96, 240, 336) = 48
ii. Number of stacks = $\frac{336}{48}$ = 7
iii. Total number of stacks = $\frac{96}{48} + \frac{240}{48} + \frac{336}{48}$
= 14
OR
Height of each stack of History = 48 $\times$ 1.8 = 86.4 cm
Height of each stack of Science = 48 $\times$ 2.2 = 105.6 cm
Height of each stack of Mathematics = 48 $\times$ 2.5 = 120 cm

37. i. 8 coins
ii. Money in the piggy bank day wise 5, 10, 15, 20 ...
Money after 8 days = ₹ 180
iii. a. We can have at most 120 coins.
$\frac{n}{2}[2(1) + (n-1)1] = 120$
$n^2 + n - 240 = 0$
Solving for n, we get, n = 15 as n $\neq$ -16
$\therefore$ Number of days = 15
OR
b. Total money saved = 120 $\times$ 5 = ₹ 600

38. i. Mid point of FG is $\left(\frac{-3+1}{2}, \frac{0+4}{2}\right)$ = (-1, 2)

ii. a. $\text{AC} = \sqrt{(-1-3)^2 + (-2-4)^2}$

$= \sqrt{52}$ or $2\sqrt{13}$

OR

b. The coordinates of required point are $\left(\frac{1\times3+3\times3}{1+3}, \frac{1\times2+3\times4}{1+3}\right)$ i.e. $\left(3, \frac{7}{2}\right)$

iii. D(-2, -5)