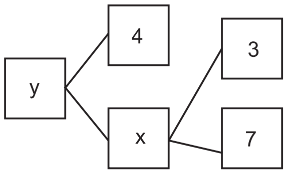
Solutions to RSPL/3 (Basic)

1. (b),



$x = 7 \times 3 = 21$

$y = 4 \times 21 = 84$

$\therefore$ Option (b) is correct.

2. (c),

$$\begin{aligned} f(x) &= (x-2)^2 + 4 \\ &= x^2 + 4 - 4x + 4 \\ f(x) &= x^2 - 4x + 8 \\ a &= 1, b = -4, c = 8 \\ \text{D} &= b^2 - 4ac \\ &= (-4)^2 - 4 \times 8 \\ &= 16 - 32 = -16 < 0 \end{aligned}$$

The given equation have no zero

$\therefore$ Option (c) is correct.

3. (c), diameter of larger wheel = 50 cm

Radius of larger wheel = $\frac{50}{2}$ = 25 cm

Circumference of larger wheel (1 revolution) = $2\pi r = 2\pi \times 25$ cm $= 50\pi$ cm

Distance travelled in 15 revolutions = $15 \times 50\pi = 750\pi$ cm

Diameter of smaller wheel = 30 cm

Circumference of smaller wheel = $2\pi(15) = 30\pi$ cm

Number of revolutions made by smaller wheel

$$= \frac{\text{Total distance travelled by larger wheel}}{\text{circumference of smaller wheel}}$$

$$= \frac{750\pi}{30\pi} = 25$$

$\therefore$ Option (c) is correct.

4. (c), Let α and β are roots of the quadratic equation $x^2 + bx + 1 - b = 0$,

Such that $\alpha = 1 - b$

$$\alpha + \beta = \frac{-b}{a} \text{ and } \alpha\beta = \frac{c}{a} = \frac{1-b}{1}$$

$$\alpha \cdot \beta = 1 - b$$

$$\Rightarrow \quad (1-b)\beta = (1-b)$$

$$\Rightarrow \quad \beta = 1$$

$$\alpha + \beta = -b$$
$$1 - b + \beta = -b$$
$$\beta = -1$$

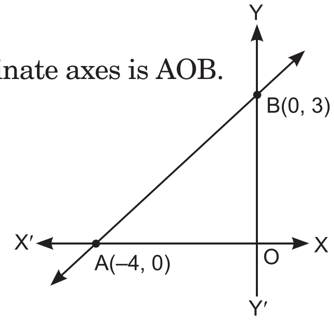
Roots are (1, – 1)

$\therefore$ Option (*c*) is correct.

5. (*d*), $\because$ Probability of sure event is always 1.

6. (*a*), as

Let the triangle formed by line $3x - 4y + 12 = 0$ with coordinate axes is AOB.



A(–4, 0) B(0, 3) O(0, 0)

x	0	–4
y	3	0

$$\text{Area of } \Delta AOB = \frac{1}{2}|-4(3-0) + 0(0-0) + 0(0-3)|$$
$$= \frac{1}{2}|-12| = 6 \text{ unit}^2$$

$\therefore$ Option (*a*) is correct.

7. (*c*), $n = 31, a_{16} = m$

$$a_{16} = a + 15d = m$$
$$s_{31} = \frac{31}{2}[2a + (31-1)d]$$
$$= \frac{31}{2}[2a + 30d)$$
$$\Rightarrow \quad = \frac{31}{2} \times 2(a + 15d) = 31 \text{ m}$$

$\Rightarrow$ $\therefore$ Option (*c*) is correct.

8. (*d*), Two lines in the plane either intersect or are parallel.

$\therefore$ Option (*d*) is not possible.

9. (*c*), Cost of each pen is ₹ x, cost of each pencil is y

cost of 3 pens and 5 pencils = $3x + 5y = 40$

Cost of 5 pens and 4 pencils = $5x + 4y = 58$

$\therefore$ Option (*c*) is correct.

10. (*b*), $\dfrac{\cos x}{1-\tan x} + \dfrac{\sin x}{1-\cot x}$

$$= \frac{\cos x}{1 - \frac{\sin x}{\cos x}} + \frac{\sin x}{1 - \frac{\cos x}{\sin x}}$$
$$= \frac{\cos^2 x}{\cos x - \sin x} + \frac{\sin^2 x}{\sin x - \cos x}$$
$$= \frac{\cos^2 x - \sin^2 x}{\cos x - \sin x}$$
$$= \frac{(\cos x - \sin x)(\cos x + \sin x)}{(\cos x - \sin x)}$$
$$= \cos x + \sin x = \text{RHS}$$

$\therefore$ Option (*b*) is correct.

11. Point of contact

12. 120°

13. $4\pi r^2$

14.
$$A = \frac{\alpha+\beta}{2} \text{ and } \alpha\beta = G^2$$
$$\Rightarrow \quad \alpha + \beta = 2A \text{ and } \alpha\beta = G^2$$

Quadratic equation whose roots are α and β is $x^2 - 2Ax + G^2 = 0$

$$\Rightarrow \quad x^2 - 2Ax + G^2 = 0$$

OR

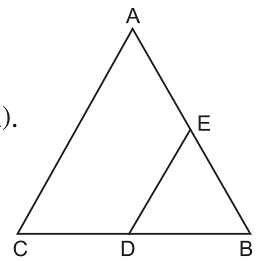
We have $ax^2 + bx + c = 0$

For equal roots

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

15. Trigonometry

16. Given $BD = \frac{1}{2}BC \Rightarrow 2BD = BC$



Also, $\Delta ABC \sim \Delta BDE$ (both triangles are equilateral triangles, given).

$$\frac{\text{Area of } \Delta ABC}{\text{Area of } \Delta BDE} = \frac{BC^2}{BD^2}$$
$$= \frac{(2BD)^2}{BD} = \frac{4BD^2}{BD^2} = \frac{4}{1}$$

17. $(\alpha - \beta), (\beta - \gamma)$ are roots of equation $ax^2 + bx + c = 0$

$$\therefore \quad (\alpha - \beta) + (\beta - \gamma) = \frac{-b}{a} \text{ and } (\alpha-\beta)(\beta-\gamma) = \frac{c}{a}$$
$$(\alpha - \gamma) = \frac{-b}{a} \text{ and } (\alpha-\beta)(\beta-\gamma) = \frac{c}{a}$$

$$\Rightarrow (\gamma - \alpha) = \frac{b}{a}$$

We have,
$$\frac{(\alpha-\beta)(\beta-\gamma)}{\gamma-\alpha} = \frac{\frac{c}{a}}{\frac{b}{a}} = \frac{c}{a} \times \frac{a}{b} = \frac{c}{b}$$

OR

For coincident roots D = 0

$$\therefore \quad [-(2+m)]^2 - 4[1][-m^2 - 4m - 4] = 0$$
$$4 + m^2 + 4m + 4m^2 + 16m + 16 = 0$$
$$5m^2 + 20m + 20 = 0$$
$$m^2 + 4m + 4 = 0$$
$$\Rightarrow \quad (m+2)^2 = 0$$
$$\Rightarrow \quad m = -2$$

18. Mean weight of 9 students = 19 kg

$\Rightarrow$ Total weight of 9 students = 19 × 9 = 171 kg

A boy of 29 kg is added to group

$\Rightarrow$ Total weight of 10 students = (171 + 29) kg = 200 kg

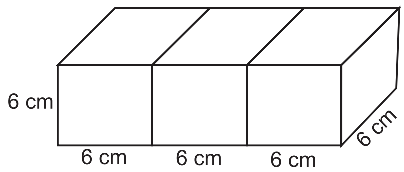
$\Rightarrow$ Mean weight of 10 students = $\frac{200}{10}$ = 20 kg

$\therefore$ The mean weight = 20 kg

19. Volume of each cube = 216 cm^3

Side of each cube = 6 cm

If cubes are joined together, it becomes a cuboid.



Length of cuboid = l = 18 cm

Breadth of cuboid = b = 6 cm

Height of cuboid = h = 6 cm

Total surface area of cuboid = $2[l \times b + b \times h + h \times l]$

$= 2[18 \times 6 + 6 \times 6 + 6 \times 18]$

$= 2[108 + 36 + 108]$

$= 2[252]$

$= 504$ cm^2

20. $[\sin^2 5° + \sin^2 85°] + [\sin^2 10° + \sin^2 80°] + [\sin^2 15° + \sin^2 75°] + [\sin^2 20° + \sin^2 70°] +$
$[\sin^2 25° + \sin^2 65°] + [\sin^2 30° + \sin^2 60°] + [\sin^2 35° + \sin^2 55°] + [\sin^2 40° + \sin^2 50°] +$
$(\sin^2 45°) + (\sin^2 90°)$

$= [\sin^2 5° + \cos^2 5°] + [\sin^2 10° + \cos^2 10°] + [\sin^2 15° + \cos^2 15°] + [\sin^2 20° + \cos^2 20°]$
$+ [\sin^2 25° + \cos^2 25°] + [\sin^2 30° + \cos^2 30°] + [\sin^2 35° + \cos^2 35°] + [\sin^2 40° + \cos^2 40°] +$
$[\sin^2 45° + \sin^2 90°]$

$= 1 + 1 + 1 + 1 + 1 + 1 + 1 + 1 + \frac{1}{\sqrt{2}} + 1 = 9 + \frac{1}{\sqrt{2}}$

21. Numbers are 105 and 84

Using Euclid's division algorithm

$105 = 84 \times 1 + 21$

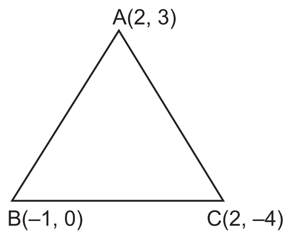
$84 = 21 \times 4 + 0$

$\therefore$ HCF = 21

22. Area of ΔABC $= \frac{1}{2}|x_1(y_2 - y_3) + x_2(y_3 - y_1) + x_3(y_1 - y_2)|$

$= \frac{1}{2}|2(0 - (-4) + (-1)(-4 - 3) + 2(3 - 0)|$

$= \frac{1}{2}|8 + 7 + 6| = \frac{21}{2}$ sq units.



23. Total number of ways to draw a card = 52

(i) Number of black face cards = 6

$\therefore$ Required probability $= \frac{6}{52} = \frac{3}{26}$

(ii) Number of red face cards = 6

Required probability $= \frac{6}{52} = \frac{3}{26}$

24.
$$2x + 3y = 9 \quad ...(i)$$
$$3x + 4y = 5 \quad ...(ii)$$

From equation (i) we get

$$x = \frac{9 - 3y}{2} \quad ...(iii)$$

Substituting in equation (ii) we get

$$3\left(\frac{9-3y}{2}\right) + 4y = 5$$

$$\Rightarrow \quad 27 - 9y + 8y = 10$$
$$y = 17$$

When $y = 17$, equation (iii) becomes

$$x = \frac{9 - 51}{2} = -21$$

$$\therefore \quad x = -21, \; y = 17$$

OR

$$7x + 11y - 3 = 0 \quad ...(i)$$
$$8x + y - 15 = 0 \quad ...(ii)$$

From equation (ii) we get

$$y = 15 - 8x \quad ...(iii)$$

Substituting in equation (i) we get

$$7x + 11(15 - 8x) - 3 = 0$$
$$7x + 165 - 88x - 3 = 0$$
$$81x = 162$$
$$x = 2$$

When $x = 2$, equation (iii) becomes

$$y = 15 - 8 \times 2 = -1$$

$$\therefore \quad x = 2, y = -1$$

25.
$$A + B = 90° \Rightarrow B = 90° - A \quad ...(i)$$

Now $\quad \cot B = \cot (90° - A) = \tan A \quad$ [using (i)]

$$\Rightarrow \quad \cot B = \frac{3}{4}$$

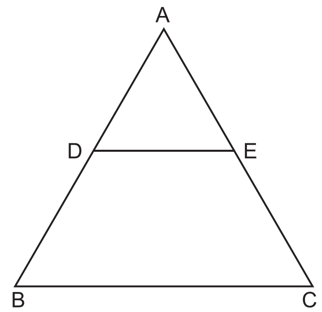
OR

$\tan 10° \cdot \tan 75° \cdot \tan 15° \cdot \tan 80°$

$$= \cot(90° - 10°) \cdot \cot(90° - 75°) \cdot \tan 15° \cdot \tan 80°$$

$$= \cot 80° \times \cot 15° \times \frac{1}{\cot 15°} \times \frac{1}{\cot 80°} = 1$$

26. In ΔABC and ΔADE



$\because$ DE | | BC

$$\angle ADE = \angle ABC \text{ (corresponding angles)}$$

$$\angle AED = \angle ACB \text{ (corresponding angles)}$$

$$\therefore \quad \angle A = \angle A \text{ (common)}$$

$$\therefore \quad \Delta ADE \sim \Delta ABC \qquad \text{(SAS)}$$

$$\Rightarrow \quad \frac{AD}{AB} = \frac{DE}{BC}$$

$$\Rightarrow \quad \frac{3}{AD + DB} = \frac{6}{BC}$$

$$\frac{3}{3+2} = \frac{6}{BC} \Rightarrow BC = \frac{6 \times 5}{3}$$

$$\Rightarrow \quad BC = 10 \text{ cm}$$

27. The bells will toll together at an interval of 9, 12 and 15 minutes.

$$9 = 3^2,\ 12 = 2^2 \times 3,\ 15 = 3 \times 5$$

$$\therefore \quad \text{LCM } (9, 12, 15) = 3^2 \times 2^2 \times 5 = 180$$

$\therefore$ Bells will toll together after 180 minutes.

28. $$x + 2y - 7 = 0 \qquad ...(i)$$

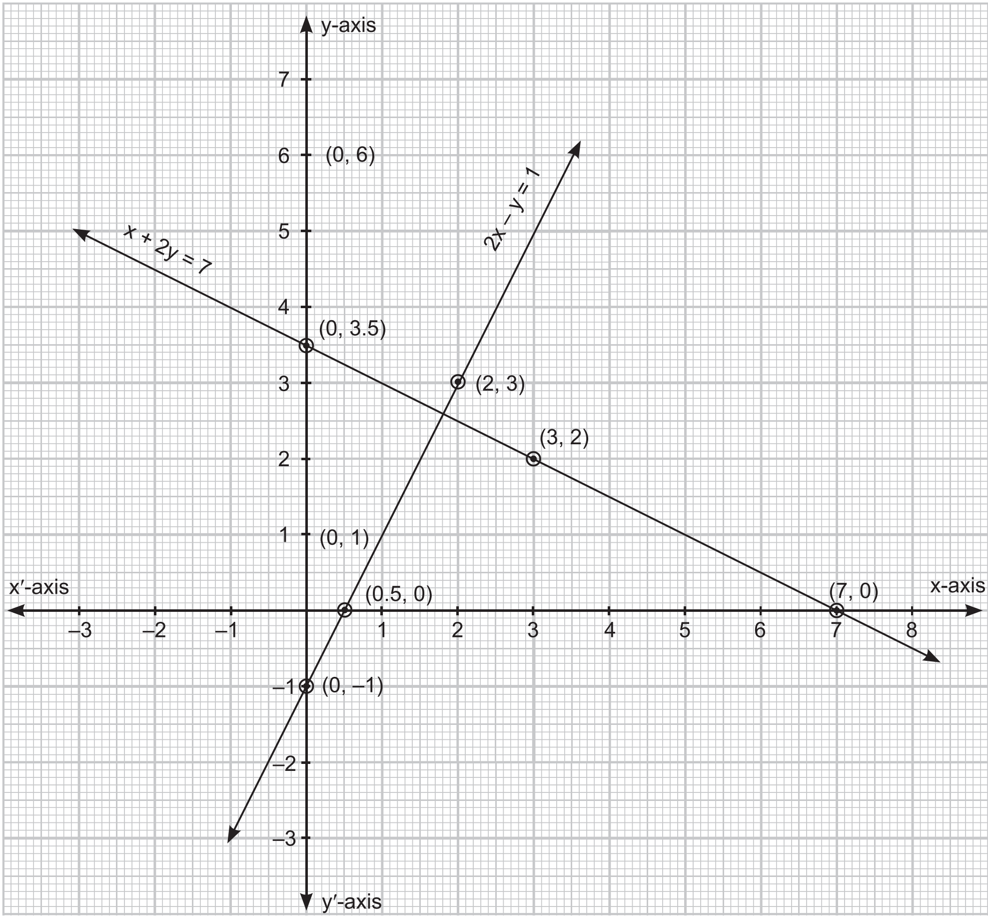
$$2x - y - 1 = 0 \qquad ...(ii)$$

Table for equation (*i*)

x	7	0	3
y	0	3.5	2

Table for equation (*ii*)

x	0.5	0	2
y	0	–1	3



Points meet at y-axis at (0, 3.5) and (0, –1).

29. The coordinates of house be H(2, 4) and office be O(13, 26)

Distance between house to office

$$HO = \sqrt{(13-2)^2+(26-4)^2}$$
$$= \sqrt{(11)^2+(22)^2}$$
$$HO = \sqrt{121+484}$$
$$= \sqrt{605}$$
$$HO = 11\sqrt{5} \text{ km}$$

The coordinates of bank and school respectively B(5, 8) and S(13, 14)

$$HB = \sqrt{(5-2)^2+(8-4)^2}$$
$$= \sqrt{9+16}$$
$$= \sqrt{25}$$
$$= 5 \text{ km}$$
$$BS = \sqrt{(13-5)^2+(14-8)^2}$$
$$= \sqrt{64+36} = \sqrt{100}$$
$$= 10 \text{ km}$$

$$SO = \sqrt{(13-13)^2+(26-14)^2}$$
$$= \sqrt{(12)^2} = 12km$$
$$\text{Totaldistance} = 5km+10km+12km$$
$$= 27km$$
$$\text{Extradistancetravelled} = (27-11\sqrt{5})km$$
$$= 27-11(2.236)$$
$$= 27-24.596$$
$$= 2.404km$$

30. $$(\sin A+\cos A)\sec A = (\sin A+\cos A)\times\frac{1}{\cos A}=\frac{\sin A+\cos A}{\cos A}$$
$$= \frac{\sin A}{\cos A}+\frac{\cos A}{\cos A}$$
$$= \tan A+1=\frac{5}{12}+1=\frac{17}{2}$$

31. **Given:** Two parallel tangents to a circle with centre O. Tangent AB with point of contact C intersectsXYatAandX′Y′atB.

ToProve:$\angle AOB=90°$

Construction: JoinOA,OBandOC

Proof: InΔAOPandΔAOC

$AP = AC$ [Lengthsoftangentsfromcommonpoint]

$OP = OC$ [Radii]

$OA = OA$ [Common]

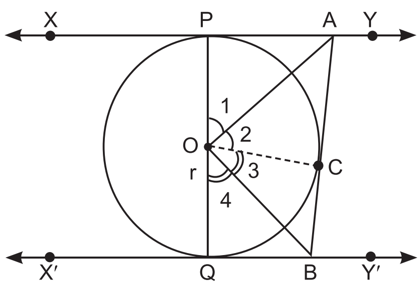
$\Rightarrow$ $\Delta AOP \cong \Delta AOC$ [SSScongruencerule]

$\Rightarrow$ $\angle PAO = \angle CAO$ [C.P.C.T]

$\therefore$ $\angle PAC = 2\angle OAC$ ...(*i*)

Similarly $\angle QBC = 2\angle OBC$ ...(*ii*)

Adding(*i*)and(*ii*),weget



$\angle PAC+\angle QBC = 2[\angle OAC+\angle OBC]$

$\angle PAC+\angle QBC = 180°$ [interiorconsecutive anglesonsamesideoftransversal]

$2[\angle OAC+\angle OBC] = 180°$

$\Rightarrow$ $\angle OAC+\angle OBC = 90°$

InΔAOB,$\angle AOB+\angle OAC+\angle OBC=180°$

$\Rightarrow$ $\angle AOB+90° = 180°$ $\Rightarrow$ $\angle AOB=90°$

OR

$BR = BP$ (lengthoftangentsfromB)

$\therefore$ $BP = 3cm$

Similarly $AR = AQ$

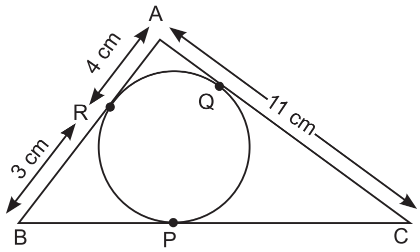
⇒ $AQ = 4$ cm

$QC = AC - AQ = 11 - 4 = 7$ cm

Also $QC = PC$

⇒ $PC = 7$ cm

Now $BC = BP + PC = 3 + 7 = 10$ cm



32. Given: In ΔABC, $AB \perp BC$ and $DE \perp AC$

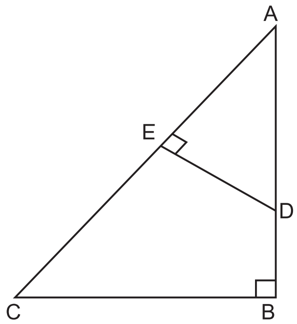
To prove: $\Delta ABC \sim \Delta AED$.

Proof: In ΔAED and ΔABC

$\angle AED = \angle ABC$ (each 90°)

$\angle A = \angle A$ (common)

∴ $\Delta AED \sim \Delta ABC$ (AA corollary)

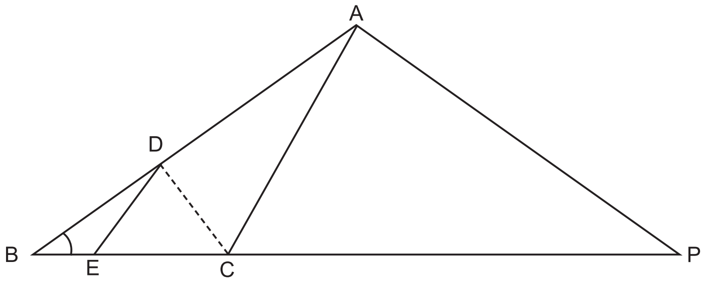


OR

Given: In ΔABC, $DE \parallel AC$

$$\frac{BE}{EC} = \frac{BC}{CP} \quad ...(i)$$

To prove: $DC \parallel AP$



Construction: Join DC

Proof: In ΔACB, $DE \,||\, AC$ (given)

∴ $$\frac{BE}{EC} = \frac{BD}{AD} \quad ...(i) \text{ (By BPT)}$$

Also, $$\frac{BE}{EC} = \frac{BC}{CP} \quad ...(ii) \text{ (Given)}$$

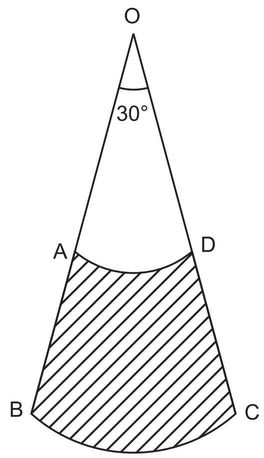
From (*i*) and (*ii*)

$$\frac{BD}{AD} = \frac{BC}{CP}$$

In ΔABP, $$\frac{BD}{AD} = \frac{BC}{CP} \quad \text{(proved)}$$

$CD \,||\, AC$ (Using converse of B.P.T.)

33. OA = 7 cm



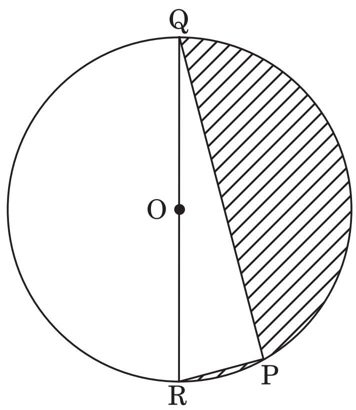
$$\begin{aligned} OB &= OA + AB \\ &= 7 + 21 = 28 \text{ cm} \\ \angle AOD &= \theta = 30° \\ \text{Area of sector AOD} &= \frac{\theta}{360°} \times \pi r^2 \\ &= \frac{30}{360} \times \pi \times 7 \times 7 \ (r = 7 \text{ cm}) \\ &= \frac{49\pi}{12} \text{ cm}^2 \\ \text{Area of sector BOC} &= \frac{30}{360} \times \pi \times 28 \times 28 \ (r = 28 \text{ cm}) \\ &= \frac{196\pi}{3} \text{ cm}^2 \end{aligned}$$

$$\text{(shaded area) Area swept by wiper} = \left(\frac{196\pi}{3} - \frac{49\pi}{12}\right) \text{cm}^2 = \left(\frac{784-49}{12}\right)\pi \text{ cm}^2$$

$$= \frac{735}{12}\pi = \frac{245}{4}\pi \text{ cm}^2$$

OR

OR is diameter of circle



ΔQPR is a right-angled triangle

$$\begin{aligned} \therefore \quad QR^2 &= PQ^2 + PR^2 \\ &= (24)^2 + (7)^2 = 576 + 49 \\ QR^2 &= 625 \\ QR &= 25 \text{ cm} \\ \therefore \quad OR &= \frac{1}{2} QR = \frac{25}{2} \text{ cm.} \end{aligned}$$

Area of shaded region = area of semicircle – area of ΔPQR

$$\begin{aligned} &= \frac{\pi}{2}\left(\frac{25}{2}\right)^2 - \frac{1}{2} \times 7 \times 24 \\ &= \frac{22}{7} \times \frac{1}{2} \times \frac{625}{4} - 84 \\ &= \left(\frac{6875}{28} - 84\right) \text{cm}^2 \\ &= (245.53 - 84) \text{ cm}^2 \\ &= 161.53 \text{ cm}^2 \end{aligned}$$

34.

Life time (in hours)	Frequency (f_i)	Class marks (x_i)	$u_i = \frac{x_i - a}{h}$	$f_i u_i$
0 – 20	10	10	– 2	– 20
20 – 40	35	30	– 1	– 35
40 – 60	52	50	0	0
60 – 80	61	70	1	61
80 – 100	38	90	2	76
100 – 120	29	110	3	87
Total	225			169

Here, $a = 50$, $h = 20$

We have, $\text{Mean} = a + \frac{\Sigma f_i u_i}{\Sigma f_i} \times h$

$= 50 + \frac{169}{225} \times 20$

$= 50 + \frac{3380}{225} = 50 + 15.02 = 65.02$

Average life time of electrical components is 65.02

35. Let two successive integral multiples of 5 are $5x$ and $5(x+1)$

$\therefore \quad (5x)(5x + 5) = 300$

$25x^2 + 25x = 300$

$x^2 + x - 12 = 0$

$x^2 + 4x - 3x - 12 = 0$

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

$x = -4$ (rejected) and $x = 3$ (rejected)

1st integral of 5 = $5 \times 3 = 15$

Next successive integral = $5(3 + 1)$

$= 5 \times 4 = 20$

OR

Let speed of the train = x km/hr

Distance = 360 km

Time taken = $\frac{360}{x}$ hr

When speed = $(x + 10)$ km/hr

Time taken = $\frac{360}{x+10}$ hr

A.T.Q. $\frac{360}{x} - \frac{360}{x+10} = 3$

$360x + 3600 - 360x = 3x^2 + 30x$

$3x^2 + 30x - 3600 = 0$

$$\Rightarrow \quad x^2 + 10x - 1200 = 0$$

$$(x + 40)(x - 30) = 0$$

$$x = -40 \text{ or } x = 30$$

Rejecting $x = -40$ we get $x = 30$

$\therefore$ Usual speed of the train = 30 km/hr

36. Let Ist term of the A.P. = a

Common difference = d

A.T.Q. $\quad a_4 + a_8 = 24$

$\Rightarrow \quad a + 3d + a + 7d = 24$

$2a + 10d = 24$

$\Rightarrow \quad a + 5d = 12 \qquad ...(i)$

Also $\quad a_6 + a_{10} = 44$

$\Rightarrow \quad a + 5d + a + 9d = 44$

$\Rightarrow \quad 2a + 14d = 44$

$\Rightarrow \quad a + 7d = 22 \qquad ...(ii)$

Solving (i) and (ii)

$$a + 7d = 22$$
$$a + 5d = 12$$
$$- \quad - \qquad -$$

$$2d = 10 \quad \Rightarrow \quad d = 5$$

When $d = 5$, eq. (i) becomes

$$a + 5 \times 5 = 12$$

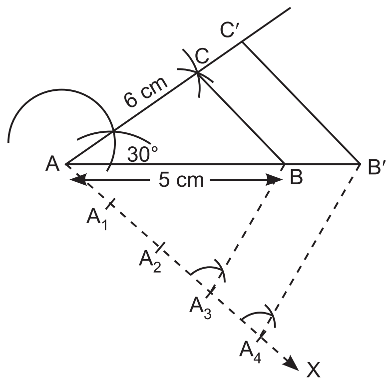
$$a = -13$$

$$a_1 = a = -13$$

$$a_2 = a + d = -13 + 5 = -8$$

$$a_3 = a + 2d = -13 + 10 = -3$$

37.



AC′B′ is the required triangle.

38. Let kite is at K

AK = length of string = 54 m

$$BK = \text{height of the kite above the ground}$$

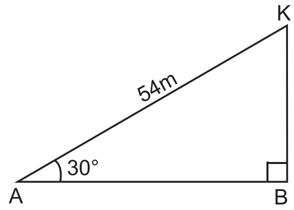
$$\angle KAB = 30°$$

In right ΔKBA,

$$\frac{KB}{AK} = \sin 30°$$

$$\frac{KB}{54} = \frac{1}{2}$$

$$KM = 27 \text{ m}$$



∴ Height of the kite above the ground = 27 m

39.

Age (in years)	Number of patients (f_i)	*c.f.*
0 – 10	22	22
10 – 20	10	32
20 – 30	8	40
30 – 40	15	55
40 – 50	5	60
50 – 60	6	66
Total	66	

N = 66, $\frac{N}{2} = 33$

Then median class is 20 – 30

here, $l = 20$, $f = 8$, $c.f. = 32$, $h = 10$

$$\text{Median} = l + \left(\frac{\frac{N}{2} - c.f.}{f}\right) \times h$$

$$= 20 + \left(\frac{33 - 32}{8}\right) \times 10$$

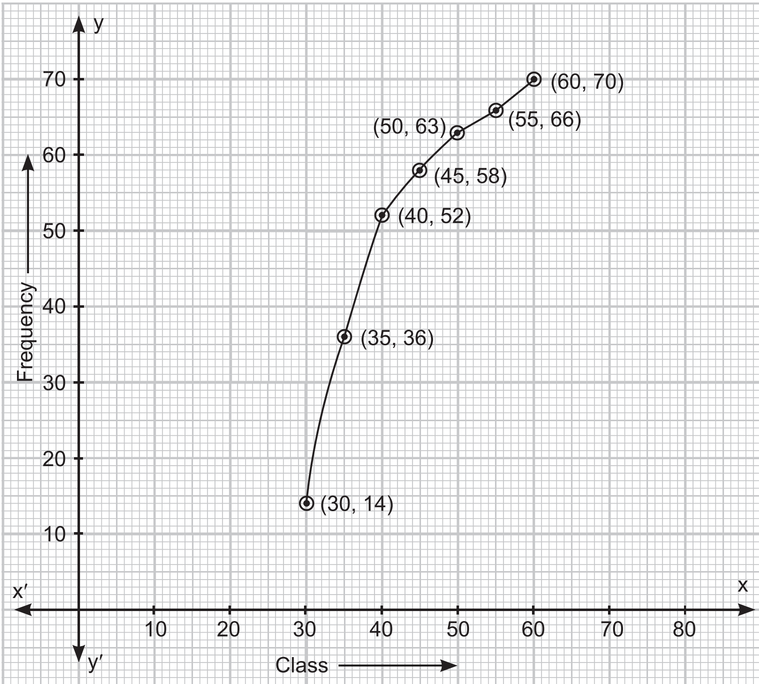
$$= 20 + \frac{10}{8}$$

$$= 20 + 1.25$$

$$\text{Median} = 21.25$$

OR

Classes	Frequency	*c.f.*	Points
25 – 30	14	14	(30, 14)
30 – 35	22	36	(35, 36)
35 – 40	16	52	(40, 52)
40 – 45	6	58	(45, 58)
45 – 50	5	63	(50, 63)
50 – 55	3	66	(55, 66)
55 – 60	4	70	(60, 70)

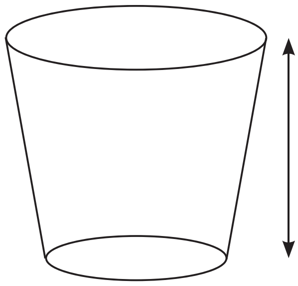


40. Radius of upper end

$$R = 20 \text{ cm}$$

Radius of lower end $r = 8$ cm

Height $(h) = 16$ cm



Let slant height = l cm

$$l = \sqrt{h^2 + (R - r)^2}$$

$$l = \sqrt{(16)^2 + (12)^2} = 20 \text{ cm}$$

$$\text{Area of metal sheet} = \pi l(R + r) + \pi r^2$$

$$= \pi \times 20(20 + 8) + \pi \times 8^2$$

$$= 560\pi + 64\pi = 624\pi \text{ cm}^2$$

$$\text{Rate of metal sheet} = \frac{₹\,15}{100 \text{ cm}^2}$$

$$\text{Total cost} = ₹\,624\,\pi \times \frac{15}{100} = ₹\,\frac{624 \times 22 \times 15}{7 \times 100}$$

$$= ₹\,294.17 \text{ (app.)}$$

OR

Radius of upper end = $R_1 = \frac{40}{2} = 20$ cm

Radius of lower end = $R_2 = \frac{20}{2} = 10$ cm

Let height be h cm

Volume of bucket = 17600 cm^3

$$\Rightarrow \quad \frac{1}{3}\pi h\,(R_1^{\,2} + R_2^{\,2} + R_1R_2) = 17600$$

$$\Rightarrow \quad \frac{1}{3} \times \frac{22}{7} \times h\,[(20)^2 + (10)^2 + 20 \times 10] = 17600$$

$$\Rightarrow \quad h = \frac{17600 \times 7 \times 3}{22 \times 700} = 24 \text{ cm}$$

Now slant height of bucket

$$l = \sqrt{h^2 + (R_1 - R_2)^2}$$

$$l = \sqrt{(24)^2 + (10)^2} = \sqrt{676} = 26 \text{ cm}$$

$$\text{Total surface area} = \pi R_2^2 + \pi l\,(R_1 + R_2)$$

$$= \pi[(10)^2 + 26\,(20 + 10)]$$

$$= \frac{22}{7} \times 880 \text{ cm}^2 = 2765.714 \text{ cm}^2$$