KENDRIYA VIDYALAYA SANGATHAN

CLASS- X SESSION- 2022- 23

SUBJECT- MATHEMATICS (STANDARD) 041

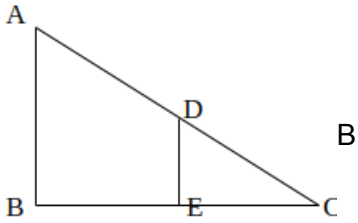
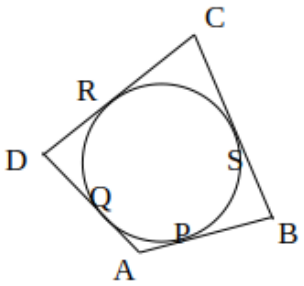
PRE BOARD- 1

MARKING SCHEME

Q.NO	SOLUTION	MKS
1	(c) 35	1
2	(b) x2 –(p+1)x +p=0	1
3	(b) 2/3	1
4	(d) 2	1
5	(c) (2,-1)	1
6	(d) 3^2 x 5^2 x 17	1
7	(b) tan 30°	1
8	(b) 2	1
9	(c) x= ay (a+b)	1
10	(c) 8cm	1
11	(d) 3√3cm	1
12	(d) 9π cm2	1
13	(c) n^2 + n	1
14	(a) 55/3	1
15	(d) 7000	1
16	(a) 120	1
17	(d) no solution	1
18	(c) 30	1
19	(b) Both assertion (A) and reason (R) are true and reason (R) is not the correct explanation of assertion (A)	1
20	(a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A)	1
	SECTION B	
21	(i)PE/EQ ≠ PF/FR , not parallel (ii) PE/QE = PF/RF, parallel	1+1
22	For correct explanation.	1+1
23	For using correct section formula for x and y x = 1, y = 3 Required point(1,3)	1 .5 .5
24	Time =5min, θ=30^0 area swept $\frac{\theta}{360}\pi r^2$ 154/3cm^2 **OR** area of sector = $\frac{\theta}{360}\pi r^2$ = 1232/3 cm^2	1 1 .5

	area of triangle = 333.2, area of six design =464.82cm^2 Cost of making design = 464.82 x .35 = 162.68rs	.5 .5 .5
25	PQ ∥ RS (Given) ∠ P = ∠ S (Alternate angles) ∠ Q = ∠ R ∠ POQ = ∠ SOR (Vertically opposite angles) Δ POQ ~ Δ SOR (AAA similarity criterion) **OR** OA . OB = OC . OD (Given) so, OA/OC = OD/OB ∠ AOD = ∠ COB (Vertically opposite angles) Therefore, from (1) and (2), Δ AOD ~ Δ COB (SAS similarity criterion) So, ∠ A = ∠ C and ∠ D = ∠ B (Corresponding angles of similar triangles	.5 .5 1 .5 .5 1
	SECTION C	
26	Let us assume 5 + 2√3 is rational, then it must be in the form of p/q where p and q are co-prime integers and q ≠ 0 i.e 5 + 2√3 = p/q So √3 = $(p-5q)\ 2q$ ……(i) Since p, q, 5 and 2 are integers and q ≠ 0, HS of equation (i) is rational. But LHS of (i) is √3 which is irrational. This is not possible. This contradiction has arisen due to our wrong assumption that 5 + 2√3 is rational. So, 5 + 2√3 is irrational.	1 .5 1 .5
27	a+2d=16 a= 4, d= 6 and 6,10,16,22.....	1 1 1
28	$\frac{\frac{CosA}{SinA}-CosA}{\frac{CosA}{SinA}+CosA}$ Cos A(1/SinA -1)/Cos A(1/SinA + 1) $\frac{CosecA-1}{CosecA+1}$ RHS **OR** (Sin^{2}A – Sin^{2}B)+ (Cos^{2}A – Cos^{2}B)/(Cos A + Cos B)(Sin A + Sin B) = 0	1 1 1 1.5
29	$cosA = \sqrt{1 - sin^2 A}$ $tanA = \frac{sinA}{\sqrt{1-sin^2 A}}$ $secA = \frac{1}{\sqrt{1-sin^2 A}}$	1 1 1
30	For correct fig and its explanation 	1

	$\tan 30^0 = AB/BC$ $1/\sqrt{3} = AB/30$ The height of the tower is $10\sqrt{3}$ m. **OR** For correct fig and its explanation OD = a and DB = $\sqrt{3}$ a $\tan\theta = DB/AD$ $\tan\theta = DB/(AO + OD)$ $\tan\theta = \sqrt{3}\,a/(a + 2b)$	 1 1 1 1 1
31	Area of sector = 150.72 cm^2 Area of equilateral triangle = $3\sqrt{3}$ $= 3 \times 1.73 = 5.19$ Area of required segment = 150.72 – 5.19 $= 145.53\ cm^2$	1 1 1
	SECTION D	
32	Let the time taken by larger pipe alone to fill the tank= x hours Therefore, the time taken by the smaller pipe = x+10 hours $x/4 + x/(x+10)$ $x^2-16x-80=0$ $(x+4)(x-20)= 0$ x=- 4, 20 x cannot be negative. Thus, x=20 x+10= 30 Larger pipe would alone fill the tank in 20 hours and smaller pipe would fill the tank alone in 30 hours. **OR** For correct fig. AP = (x + 7) m. $AP^2 + PB^2 = AB^2$ (By Pythagoras theorem) $(x + 7)^2 + x^2 = 13^2$ $x^2 + 7x – 60 = 0$ x = 5 or – 12. x cannot be negative. Thus, the pole has to be erected on the boundary of the park at a distance of 5m from the gate B and 12m from the gate A.	.5 1 1 1 1.5 .5 1 .5 1 1 .5 .5
33	For correct fig, given, construction, to prove. For correct proof.	2 3
34	In Δ PAC, BQ ‖ AP BQ/AP = CB/CA y/x = BC/AC .....(i)	 1.5

	similarly, y/z = BC/AC .....(ii) Add (i) and (ii), y/x + y/z = BC/AC + AB/AC y(1/x + 1/z) = (BC + AB)/AC y(1/x + 1/z) = AC/AC = 1 1/x + 1/z = 1/Y (a) For correct construction. For correct proof. (b) For correct fig and explanation BD = 1.2 m × 4 = 4.8 m. ∠ B = ∠ D (Each is of 90°) ∠ E = ∠ E ∆ ABE ~ ∆ CDE BE /DE = AB /CD DE = 1.6 	1.5 1 1 .5 1.5 .5 1.5 1
35	(a)For correct figure, given, to prove, constuction For correct proof . (b) AP = AS.....(i) BP =BQ.....(ii) CR = CQ.....(iii) DR = DS.....(iv) Adding (i), (ii), (iii), (iv) AB + CD = AD + BC 	1 2 1 1
36	1. a) (2,25) 2. c) (8,20) 3. c) √61	1 1 2
37	1. c)100m 2. d)60m 3. b)40m	1 1 2
38	1. b) x + 10y =75, x + 15y = 110 2. c) Rs.355 3. b) Rs.289	1 1 2