ACE OF PACE

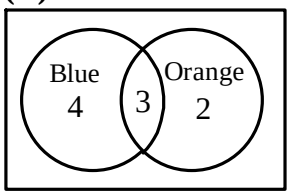
ADVANCED (CODE - 01) **ANSWERS KEY** **DATE: 06/01/2019**

Question	Answer
1	A
2	A
3	B
4	A
5	A
6	B
7	B
8	B
9	C
10	D
11	B
12	A
13	D
14	C
15	A
16	C
17	B
18	A
19	B
20	D
21	A
22	D
23	D
24	A
25	C
26	2700
27	230

SECTION A : SOLUTION

1. **(A)**

2. **(A)**



Children have an orange block but not a blue block is 2

3. **(B)**

If $x + y + z = 0$

Then, $x^3 + y^3 + z^3 = 3xyz$

So, $x^3 + y^3 + z^3 - 3xyz = 0$

4. **(A)**

Work of Mr. Karthik in 1 hr = $1/y$

Work of Mr. Karthik in 2 hr = $2/y$

Fraction of assignment was left incomplete
= Total work – work completed in 2 hr
= $1 - 2/y$

5. **(A)**

$$\frac{6435 + 6927 + 6855 + 7230 + 6562 + x}{6} = 6500$$

x = 4991

6. **(B)**

$x = 3^{34}, \quad y = 2^{51}$

$x = \left(3^2\right)^{17}, \quad y = \left(2^3\right)^{17}$

$x = 9^{17}, \quad y = 8^{17}$

$9^{17} > 8^{17}$

x > y

7. **(B)**

$$\frac{a^2 + b^2}{c^2 + d^2} = \frac{(2x + y)^2 + (2x - y)^2}{(x + 2y)^2 + (x - 2y)^2}$$

$$= \frac{8x^2 + 2y^2}{2x^2 + 8y^2} = \frac{4x^2 + y^2}{x^2 + 4y^2}$$

8. **(B)**

$$(\operatorname{cosec}\theta-\sin\theta)(\sin\theta-\cos\theta)(\tan\theta+\cot\theta)$$

$$=\left(\frac{1}{\sin\theta}-\sin\theta\right)\left(\frac{1}{\cos\theta}-\cos\theta\right)\left(\frac{\sin\theta}{\cos\theta}+\frac{\cos\theta}{\sin\theta}\right)$$

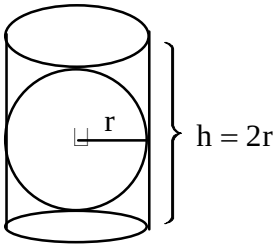
$$=\left(\frac{1-\sin^2\theta}{\sin\theta}\right)\left(\frac{1-\cos^2\theta}{\cos\theta}\right)\left(\frac{\sin^2\theta+\cos^2\theta}{\sin\theta\cos\theta}\right)$$

$$=\left(\frac{\cos^2\theta}{\sin\theta}\right)\left(\frac{\sin^2\theta}{\cos\theta}\right)\left(\frac{1}{\sin\theta\cos\theta}\right)=1$$

9. **(C)**

10. **(D)**

11. **(B)**



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

$$V_{cyclic}=\pi r^2 h$$

$$=2\pi r^3$$

$$\frac{V_{sphere}}{V_{cyclic}}=\frac{\frac{4}{3}\pi r^3}{2\pi r^3}=\frac{2}{3}=2:3$$

12. **(A)**

ROSE $\rightarrow$ SPTE

+ 1 in every latter

Then

LIFE $\rightarrow$ MJGF

13. **(D)**

$2kx^2+5kx+2=0, 2k\neq 0$

If roots are equal then

$(5k)^2-4(2k)(2)=0$

$25k^2-16k=0$

$k(25k-16)=0$

$k\neq 0, \quad k=16/25$

14. (C)

15. (A)

No. of squares of

$4\times4 \rightarrow 1$

$3\times3 \rightarrow 2^2$

$2\times2 \rightarrow 3^2$

$1\times1 \rightarrow 4^2$

The total number of squares

$= 1 + 4 + 9 + 16 = 30$

16. (C)

$\angle PCQ = 180^\circ - \angle CQP - \angle CPQ$

$= 180^\circ - 25^\circ - 25^\circ$

$= 130^\circ$

Similarly $\angle PCR = 180^\circ - \angle CPR - \angle CRP$

$= 180^\circ - 15^\circ - 15^\circ$

$= 150^\circ$

$\angle QCR + \angle PCQ + \angle PCR = 360^\circ$

$\therefore \angle QCR = 360^\circ - 130^\circ - 150^\circ$

$= 80^\circ$

17. (B)

$25^{x-1} = 5^{2x-1} - 100$ (given)

Or, $5^{2(x-1)} = 5^{2x-1} - 100$

Or , $5^{2x-1} - 5^{2x-2} = 100$

Only, x = 2, satisfy above equation.

18. (A)

$104^o + 90^o + 25^o + x = 360^o$ [complete angle]

$\Rightarrow x = 141^o$

19. (B)

$PQ = QR$

$\Rightarrow \angle QPR = \angle QRP$

$\Rightarrow \angle QRP = 48^o$

In ΔPQR

$\angle P + \angle Q + \angle QRP = 180^o$

[Angle sum property of Δ]

$\Rightarrow 48^o + \angle Q + 48^o = 180^o$

$\Rightarrow \angle Q = 180^o - 96^o$

$\Rightarrow \angle Q = 84^o$

20. (D)

In right ΔDBC,

$DB^2 = DC^2 - BC^2 = 17^2 - 8^2 = 225$

$\Rightarrow DB = 15cm$

And in right ΔDAB

$AB^2 = DB^2 - AD^2 = 15^2 - 12^2 = 81$

$\Rightarrow AB = 9\,cm$

Now, Area of quad. ABCD = $ar(\Delta DAB) + ar(\Delta DBC)$

$= \frac{1}{2} \times AB \times AD + \frac{1}{2} \times BC \times DB$

$= \frac{1}{2} \times 9 \times 12 + \frac{1}{2} \times 8 \times 15 = 54 + 60$

$= 114\ cm^2$

21. (A)

Let OD = x

$\Rightarrow AD = 5 - x$

In ΔOCD, $OC^2 = OD^2 + CD^2$

$\Rightarrow 5^2 = x^2 + CD^2$

$\Rightarrow CD^2 = 25 - x^2$ ……(1)

In ΔACD, $AC^2 = AD^2 + CD^2$

$\Rightarrow 6^2 = (5 - x)^2 + CD^2$

$\Rightarrow CD^2 = 11 + 10x - x^2$ …….(2)

From (1) and (2), we get

$11 + 10x - x^2 = 25 - x^2$

$\Rightarrow 10x = 14$

$\Rightarrow x = 1.4cm$

$CD^2 = 25 - (1.4)^2 = 23.04$

$\Rightarrow CD = 4.8cm$

$\therefore BC = 2 \times CD = 2 \times 4.8cm = 9.6cm$

22. (D)

$s = \frac{9 + 12 + 15}{2} = \frac{36}{2} = 18cm$

Area = $\sqrt{s\sqrt{(s-a)(s-b)(s-c)}}$

$= \sqrt{18(18-9)(18-12)(18-15)}$

$= \sqrt{18 \times 9 \times 6 \times 3} = \sqrt{9 \times 2 \times 9 \times 3 \times 2 \times 3}$

$= 9 \times 3 \times 2 = 54cm^2$.

23. (D)

Let ΔABC be an isosceles triangle and let $AL \perp BC$

Area $= \frac{1}{2} \times BC \times AL = 192 cm^2$

$\Rightarrow \frac{1}{2} \times 24 \times h = 192$

$\Rightarrow h = \left(\frac{192}{12}\right) cm = 16 cm$

Now, $BL = \frac{1}{2}(BC) = \left(\frac{1}{2} \times 24\right) cm = 12 cm$

And AL = 16 cm

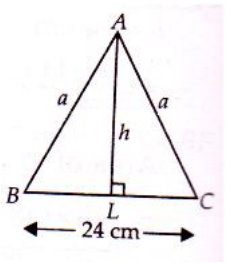
Now, in right angled ΔABL,

$AB = a = \sqrt{BL^2 + AL^2} = \sqrt{(12)^2 + (16)^2} cm$

$= \sqrt{144 + 256} cm$

$\Rightarrow a = \sqrt{400} cm = 20 cm$.

Hence perimeter $= (20 + 20 + 24) cm = 64 cm$.



24. (A)

We have:

$$\frac{1}{\alpha} + \frac{1}{\beta} = \frac{\alpha + \beta}{\alpha\beta} = \frac{-\frac{8}{3}}{\frac{2}{3}} = -4$$

25. (C)

$OA = OB \Rightarrow \angle OAB = \angle OBA = 28^o$

$\angle ABC = 90^o \Rightarrow \angle OBA + \angle OBC = 90^o$

$\Rightarrow 28^o + \angle OBC = 90^o$

$\Rightarrow \angle OBC = 90^o - 28^o = 62^o$

SECTION B : SOLUTION

26. (2700)

Total number of votes = 7500

80% of the votes are valid then number of valid votes $= 7500 \times \frac{180}{100} = 6000$

Number of valid votes other candidates got $= 6000 \times \frac{45}{100} = 2700$

27. (230)