SOLUTIONS

1. (A)
Let the number of fish Peter caught be *n*. The information in the question tells us that $3n = n + 24$, which has solution *n* = 12. Therefore Peter caught 12 fish.

2. (C)
Since six goals were scored in the first half and the away side was leading at half-time, the possible half-time scores were 0 – 6, 1 – 5, and 2 – 4. However, we are also told that the home team scored three goals in the second half and won the game. Hence the home team cannot have been more than two goals behind at half-time. Therefore the scored at half-time was 2 – 4. Hence the number of goals the home team scored in total was 2 + 3 = 5.

3. (A)


Let $R\,\text{m}^2$ be the area of the triangle shown on the diagram. The triangle with area $(P+R)\,\text{m}^2$ has base 10 m and height 10 m. Similarly, the triangle with area $(Q+R)\,\text{m}^2$ also has base 10 m and height 10m. Therefore the area of these two triangles are equal and hence $P+R=Q+R$. Therefore $P=Q$ and hence the value of $P-Q$ is 0.

4. (D)
Since Kenny covers three times the distance with each downhill jumps as he does with each uphill jumps, he will make three times as many jumps going uphill as he does covering the same distance going downhill. The question tells us that Kenny makes 2024 jumps in total and so $\frac{3}{4}$ of these, namely 1518 jumps, with be uphill. Now, since Kenny covers 1 metre per uphill jump, the distance he jumps uphill is 1518 metres. Therefore the total distance Kenny jumps is 2×1518 meters, or 3036 metres.

5. (D)
Since the average age of the three sisters is 10, their total age is $3\times10=30$.
Since the average age of one pair of the sisters is 11, their total age is $2\times11=22$ and hence the age of the sisters not included in that pairing is 30 – 22 = 8. Similarly, since the average age of a different pair of sisters is 12, their total age is $2\times12=24$ and hence the age of the sister not included in that pairing is 30 – 24 = 6. Therefore the age of the eldest sister is 30 – 8 – 6 = 16.

6. (B)
For each number *n* that Werner wrote down, Ria wrote 7 – *n*. Therefore, the sum of one of Werner's numbers and Ria's corresponding number is 7. Since the total of all Werner's numbers and all of Ria's numbers is 22 + 34 = 56, the number of numbers that Werner wrote down is 56 ÷ 7 = 8

7. (B)
The area of the circle inside the triangle is 45% of the total area of the diagram. The area of the circle outside the triangle is (100 – 40 – 45)% = 15% of the total area of the diagram. Therefore, the percentage of the circle that lies outside the triangle is $\frac{15}{15+45}\times100=25\%$.

8. (A)

The snake would only say "Yesterday was one of my lying days" on Monday, when it would be a lie and on Thursday, when it would be the truth. Similarly, the tiger would only say "Yesterday was one of my lying days" on Thursday, when it would be a lie, and on Sunday, when it would be the truth. Hence, since both said this, it was Thursday.

9. (B)

Let the number of kangaroos in each of the seven parks be P, Q, R, S, T, U and V with the corresponding number of koalas being p, q, r, s, t, u and v. The question tells us that the number of kangaroos in any park is equal to the sum of the numbers of koalas in the other six parks. Therefore we have

$$P = q+r+s+t+u+v,$$
$$Q = p+r+s+t+u+v,$$
$$R = p+q+s+t+u+v,$$
$$S = p+q+r+t+u+v,$$
$$T = p+q+r+s+u+v,$$
$$U = p+q+r+s+t+v,$$
$$V = p+q+r+s+t+u.$$

Adding these equations, we obtain

$$P+Q+R+S+T+U+V = 6(p+q+r+s+t+u+v).$$

The total number of kangaroos in the seven is 2022. Hence

$$P+Q+R+S+T+U+V = 2022.$$

Therefore

$$2022 = 6(p+q+r+s+t+u+v)$$

and hence the total number of koalas in the seven parks is

$$p+q+r+s+t+u+v = 2022 \div 6 = 337.$$

10. (B)

$\because$ The sum of all the angles of the polygon = 2160^{o}

$\Rightarrow (n-2)\times 180^\circ = 2160^\circ$

$\Rightarrow n-2 = 2160^\circ / 180^\circ$

$\Rightarrow n-2 = 12$

$\Rightarrow n = 12+2$

$\Rightarrow n = 14$

11. (B)

Let x be the common angle among all the four angles of a quadrilateral.

As per angle sum property, we know:

$4x+5x+10x+11x = 360^\circ$

$30x = 360^\circ$

$x = 12^\circ$

Hence, angles are

$4x = 4(12) = 48^\circ$

$5x = 5(12) = 60^\circ$

$10x = 10(12) = 120^\circ$

$11x = 11(12) = 132^\circ$

12. (A)

Draw a line through C parallel to DA intersecting AB produced at E.

$CE = AD$ (opposite sides)

$AD = BC$ (Given)

$BC = CE$

$\Rightarrow \angle CBE = \angle CEB$

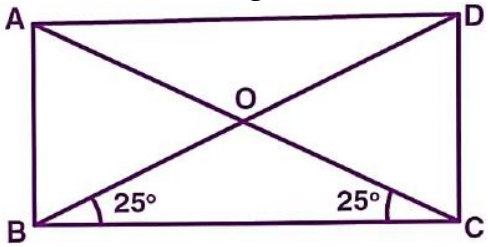
Also, $\angle A + \angle CBE = 180°$ (Angles on the same side of transversal and $\angle CBE = \angle CEB$)

$\angle B + \angle CBE = 180°$ (As

$\Rightarrow \angle A = \angle B$

13. (C)

Consider the rectangle $ABCD$



$\angle OBC = \angle OCB$ (Oppsoite angles of isosceles triangle)

Therefore, $\angle OBC + \angle OCB + \angle BOC = 180°$

$25° + 25° + \angle BOC = 180°$

$\angle BOC = 180° - 50°$

$\angle BOC = 130°$

By using the linear pair,

$\angle AOB + \angle BOC = 180°$

$\angle AOB = 180° - 130°$

$\angle AOB = 50°$

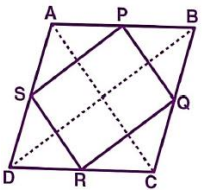
Hence, the acute angle between the diagonals is $50°$.

14. (C)

Let $ABCD$ be a rhombus.

P, Q, R, S be the midpoint of the sides AB, BC, CD and DA.

If we join the midpoints, we will get the shape rectangle.



15. (B)

Given:

$x + y + 3 = 0$

Formula used:

$(a+b)^3 = a^3 + b^3 + 3ab(a+b)$

Calculation:

$x + y + 3 = 0$

$\Rightarrow x + y = -3 \quad ...(1)$

$\Rightarrow (x+y)^3 = (-3)^3$ [Taking cube of both sides]

$\Rightarrow x^3 + y^3 + 3xy(x+y) = -27$

$\Rightarrow x^3+y^3+3xy\times(-3)=-27\ [\because\ x+y=-3]$

$\Rightarrow x^3+y^3-9xy=-27$

$\Rightarrow x^3+y^3-9xy+9=-27+9$ [Adding 9 in both sides]

$\Rightarrow x^3+y^3-9xy+9=-18$

$\therefore$ The value of $x^3+y^3-9xy+9$ is (–18).

16. (B)

Let the price of one pen be Rs. P, notebook be Rs. N and one file be Rs. F

According to the problem statement

$\Rightarrow 4P+6N+9F=305 \quad .....(\text{i})$

$\Rightarrow 3P+4N+2F=145 \quad .....(\text{ii})$

Now $2\times(\text{i})-(\text{ii})$

$\Rightarrow (8-3)P+(12-4)N+(18-2)F=5P+8N+16F=2\times305-145=465$

$\therefore$ The cost of 5 pens, 8 notebooks and 16 files is Rs. 465

17. (A)

$24x^3y^4=2\times2\times2\times3\times x\times x\times x\times y\times y\times y\times y$

$36x^4z^4=2\times2\times3\times3\times x\times x\times x\times x\times z\times z\times z\times z$

$48x^3y^2z=2\times2\times2\times2\times3\times x\times x\times x\times y\times y\times z$

The common factor is $12x^3$.

18. (C)

We know that $a^3+b^3+c^3-3abc=(a+b-c)(a^2+b^2+c^2-ab-bc-ca)$

In $x^3+8y^3+y^3-6xyz, a=x, b=2y$ and $c=z$

By using the above equation, we get

$x^3+8y^3+z^3-4xyz=(x+2y+z)(x^2+(2y)^2+z^2-x(2y)-2(2y)(z)-zx)$

$=(x+2y+z)(x^2+4y^2+z^2-2xy-2yz-zx)$

19. (A)

	Yellow	
	Green	
Red	Orange	white
	Blue	

So, yellow in opposite orange

20. (C)

Minimum value is attained at average of all points where each square becomes zero. i.e $1,-2,3,-4$

$\text{x}=\dfrac{1-2+3-4}{4}$

$=\dfrac{-2}{4}=-\dfrac{1}{2}$