1. **(d)** $x-y=10 \Rightarrow x=y+10$
Substitute this value of x in eqn $2x+3y=5$.
Then solve yourself.

2. (B)

3. **(b)** square

4. **(c)** Let the vertices of the parallelogram be $A(1,-2), B(3,6), C(5,10)$ and $D(x,y)$ since diagonals of a parallelogram bisect each other, mid - point of $AC =$ mid - point of BD

$$\Rightarrow \left(\frac{5+1}{2}, \frac{10-2}{2}\right) = \left(\frac{x+3}{2}, \frac{y+6}{2}\right)$$

$$\Rightarrow (3,4) = \left(\frac{x+3}{2}, \frac{y+6}{2}\right)$$

Now find x and y.

5. **(d)** Length of a side of the square

$$= \sqrt{(-1-4)^2 + (-5+3)^2}$$

$$= \sqrt{25+4} = \sqrt{29} \text{ units.}$$

$$\text{Area } = (\text{Side}) = \left(\sqrt{29}\right)^2 \text{ sq.units}$$

$$= 29 \text{ sq.units}$$

6. (C)

7. (C)

8. **(b)** Let the cost of one apple and one orange be Rs x and Rs y respectively.
Then, according to the given question,

$8x+5y=92 \ldots (i)$

$5x+8y=77 \ldots (ii)$

Multiplying eqn (*i*) by 5 and eqn (*ii*) by 8, we get $40x+25y=460$ (*iii*)

$40x+64y=616 \ldots (iv)$

Subtracting eqn (*iii*) from eqn (*iv*),

$$39y=156 \Rightarrow y=\frac{156}{39}=4$$

From (*i*) putting the value of y, we get

$8x+20=92 \Rightarrow 8x=72 \Rightarrow x=9$

Cost of 2 oranges and 3 apples

$= 2 \times \text{Rs}4 + 3 \times \text{Rs}9 = \text{Rs}8 + \text{Rs}27 = \text{Rs}35.$

9. (B)

10. (C)

11. **(d)** $2\sqrt{a^2+b^2}$

12. **(c)** Calculating the distance of each point from the origin, we have

(a) $\sqrt{(0-2)^2+(0+3)^2} = \sqrt{4+9} = \sqrt{13}$

(b) $\sqrt{(0-6)^2+0} = \sqrt{36} = 6$

(c) $\sqrt{(0+2)^2+(0+1)^2} = \sqrt{4+1} = \sqrt{5}$

(d) $\sqrt{(0-3)^2+(0-5)^2} = \sqrt{9+25} = \sqrt{34}$

Clearly, $(-2,-1)$ is the nearest point from the origm.

13. (B)

14. (B)

15. **(d)** Check for $\frac{a_1}{a_2} \neq \frac{b_1}{b_2}$, $\frac{a_1}{a_2} = \frac{b_1}{b_2} \neq \frac{c_1}{c_2}$

and $\frac{a_1}{a_2} = \frac{b_1}{b_2} = \frac{c_1}{c_2}$

Here $a_1=2,\ b_1=3,\ c_1=-5$

$a_2=4,\ b_2=6,\ c_2=-10.$

16. **(c)** Given, $\sqrt{(-6+6)^2+(y+1)^2} = 12$

$\Rightarrow \sqrt{y^2+2y+1} = 12$

$\Rightarrow y^2+2y+1=144 \Rightarrow y^2+2y-143=0$

$\Rightarrow y^2+13y-11y-143=0$

$\Rightarrow y(y+13)-11(y+13)=0$

$\Rightarrow (y-11)(y+13)=0 \Rightarrow y=11 \text{ or } -13$

The required positive integer is 11.

17. **(b)** 2 and 3

18. (B)

19. **(d)** Given, $AP=AQ$

$\Rightarrow AP^2 = AQ^2$

$\Rightarrow (x+3)^2+(y-2)^2 = (x-2)^2+(y+3)^2$

$\Rightarrow x^2+6x+9+y^2-4y+4$

$= x^2-4x+4+y^2+6y+9$

$\Rightarrow 10x=10y \Rightarrow x=y$

20. (A)

21. (c) Sides $PQ=\sqrt{(-5+3)^2+(-5-2)^2}$

$=\sqrt{(-2)^2+(-7)^2}=\sqrt{4+49}=\sqrt{53}$

$=\sqrt{(-2)^2+(-7)^2}=\sqrt{4+49}=\sqrt{53}$

$QR=\sqrt{(2+5)^2+(-3+5)^2}$

$=\sqrt{7^2+2^2}=\sqrt{49+4}=\sqrt{53}$

$RS=\sqrt{(4-2)^2+(4+3)^2}$

$=\sqrt{2^2+7^2}=\sqrt{4+49}=\sqrt{53}$

$PS=\sqrt{(4+3)^2+(4-2)^2}$

$=\sqrt{7^2+2^2}=\sqrt{49+4}=\sqrt{53}$

Diagonals $PR=\sqrt{(2+3)^2+(-3-2)^2}$

$=\sqrt{5^2+5^2}=\sqrt{25+25}=5\sqrt{2}$

$QS=\sqrt{(t+5)^2+(4+5)^2}$

$=\sqrt{9^2+9^2}=\sqrt{81+81}=9\sqrt{2}$

This shows, sides $PQ=QR=RS=PS$ and diagonals $PR\neq QS$

The quadrilateral is a rhombus.

22. (b) $m=18,\ n=24$

23. (C)

24. (b) $\frac{x}{2}+\frac{y}{3}=4\Rightarrow 6\times\frac{x}{2}+6\times\frac{y}{3}=6\times 4$

$\Rightarrow 3x+2y=24\ \ldots(i)$

Given, $x+y=10\Rightarrow y=10-x\ \ldots(ii)$

Substituting the value of y in (*i*), we get

$3x+2(10-x)=24$

$\Rightarrow 3x+20-2x=24\Rightarrow x=24-20=4$

From eqn (*ii*), $y=10-4=6$.

25. (d) $a=2, b=3$

26. (c) $2x+y=8\ \ldots(i)$

$-4x+3y=4\ \ldots(ii)$

Multiplying eqn (*i*) by 2 and adding to eqn (*ii*), we get

$4x+2y-4x+3y=16+4$

$\Rightarrow 5y=20\Rightarrow y=4$

Putting $y=4$ in (*i*), we get $2x+4=8$

$\Rightarrow 2x=4\Rightarrow x=2.$

27. (d) $(7,7)$

28. (D)

29. (A)

30. (B)

31. (a) Let the fraction be $\frac{x}{y}$

Given, $\frac{x+1}{y+1}=2$

$\Rightarrow x+1=2y+2\Rightarrow x-2y=1\ \ldots(i)$ and $\frac{x-1}{y-1}=3$

$\Rightarrow x-1=3y-3\Rightarrow x-3y=-2\ \ldots(ii)$ Now solve eqn (*i*) and (*ii*) for x and y.

32. (b) Total number of notes $=7\ x\ x+y=7$

Total value ofnotes $=\text{Rs}40$

$\Rightarrow 5x+10y=40$

$\Rightarrow x+2y=8$

33. (b) In the given system of equations,

$a_1=2,\ b_1=3,\ c_1=-5$

$a_2=k,\ b_2=-6,\ c_2=-8$

For a unique solution.

$\frac{a_1}{a_2}\neq\frac{b_1}{b_2}\Rightarrow\frac{2}{k}\neq\frac{3}{-6}\Rightarrow 3k\neq -12\Rightarrow k\neq -4.$

34. (d) Here, $a_1=9,\ b_1=4,\ c_1=-9$

$a_2=7,\ b_2=k,\ c_2=-5$

For no solution $\frac{a_1}{a_2}=\frac{b_1}{b_2}\neq\frac{c_1}{c_2}$

$\Rightarrow\frac{9}{7}=\frac{4}{k}\Rightarrow 9k=28\Rightarrow k=\frac{28}{9}.$

35. (c) Here, $a_1=2,\ b_1=32,\ c_1=3$

$a_2=3,\ b_2=48,\ c_2=k$

For coincident lines,

$\frac{a_1}{a_2}=\frac{b_1}{b_2}=\frac{c_1}{c_2}$

$\Rightarrow \frac{2}{3}=\frac{32}{48}=\frac{3}{k}\Rightarrow \frac{3}{k}=\frac{2}{3}\Rightarrow 2k=9$

$\Rightarrow k=\frac{9}{2}.$

36. (D) Rohit's son is Sunita's brother. Soniya and Sunita are sisters. Rohit's son is Sunita's brother. How is Rohan related to Soniya

37. (C)
38. (D)
39. (B)
40. (D)
41. (C)
42. (C)
43. (D)
44. (D)
45. (C)

46. **(a)** Let the salary of the worker per day be Rs x.

Then, $18\times x+8\times\frac{x}{2}-4\times 15=1700$

$\Rightarrow 18x+4x-60=1700\Rightarrow 22x=1760$

$\Rightarrow x=\frac{1760}{22}=80$

Total salary of a worker who came everyday on time for 30 days $=30\times \text{Rs}80=\text{Rs}$ 2400

47. **(b)** Let the total money with the person be Rs x. Then,

money spent on clothes $=$ Rs $\frac{x}{3}$

Remaining money $=$ Rs $\left(x-\frac{x}{3}\right)=\text{Rs}\frac{2x}{3}$

Money spent on food $=\frac{1}{5}\times\text{Rs}\frac{2x}{3}=\text{Rs}\frac{2x}{15}$

Now, remaining money $=\frac{2x}{3}-\frac{2x}{15}=\text{Rs}\frac{8x}{15}$

Money spent on travel $=\frac{1}{4}\times\text{Rs}\frac{8x}{15}=\text{Rs}\frac{2x}{15}$

Given, $\frac{x}{3}+\frac{2x}{15}+\frac{2x}{15}+100=x$

$\Rightarrow \frac{5x+2x+2x+1500}{15}=x$

$\Rightarrow 9x+1500=15x\Rightarrow 6x=1500$

$\Rightarrow x=\frac{1500}{6}=\text{Rs}250$

48. **(a)** $\frac{2}{x+3}-\frac{4}{x-3}=\frac{-6}{x+3}$

$\Rightarrow \frac{2(x-3)-4(x+3)}{(x+3)(x-3)}=\frac{-6}{x+3}$

$\Rightarrow \frac{2x-6-4x-12}{(x+3)(x-3)}=\frac{-6}{(x+3)}$

$\Rightarrow \frac{-2x-18}{x-3}=-6\Rightarrow -2x-18=-6x+18$

$\Rightarrow 4x=36\Rightarrow x=9$

49. **(d)** Let the digit m the unit' s place $=x$

Let the digit in the ten's place $=x+4$

The number is

$10(x+4)+x=10x+40+x=11x+40$

Sum of the digits $=x+x+4=2x+4$

Given, $2x+4=\frac{1}{7}(11x+40)$

$\Rightarrow 14x+28=11x+40z3x=12xx=4$

The number is $11\times 4+40=44+40=84$

50. **(c)** 32 years