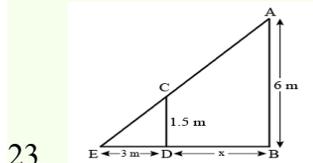ANSWER KEY

1) (C)500
2) (D) 36
3) (B) −10
4) (B) Parallel
5) (C) 0 and 2
6) (A) 4 : 6
7) **(C) x = $\frac{ay}{a+b}$**
8) (A) AAA similarity criterion
 9) (B) no real roots
10)   (C)38
11)   (B) k= 10
12)   (C) (5,0)
 13. (A) 1:2
 14. (B) 22
15. (C) $\frac{11}{36}$
16. (D) 1/7
17. (A) x^2 +5x+6
 18. (A) 2
 19. B
 20. A

SECTION B

21. 4/4=1
22. ½ ^{2}+k x ½ -5/4= 0⇒k/2=1 Therefore, the value of k is 2
23.

Here, woman and pole both are standing vertically,
So, CD II AB   In ΔCDE and ΔABE,   ∠E=∠E [common angle]
∠ABE=∠CDE [each equal to 90∘]   ∴ ΔCDE~ΔABE [by AAA similarity criterion]
Then, ED/EB=CD/AB
⇒ 3/(3+x)=1.5/ 6=1/4 ∴ x=9 m
Hence, she is at the distance of 9m from the base of the pole
24. (√3 x – 2) (x – 2√3) = 0   the zeroes of the given polynomial are 2/√3 and 2√3
25.

Therefore we can write $\sqrt{5} = \frac{p}{q} - \sqrt{3}$

$(\sqrt{5})^2 = (\frac{p}{q} - \sqrt{3})^2$

$5 = \frac{p2}{q2} - \frac{2p\sqrt{3}}{q} + 3$

$5 - 3 = \frac{p2}{q2} - \frac{2p\sqrt{3}}{q}$

$\frac{p2}{q2} - 2 = \frac{2p\sqrt{3}}{q}$

$\frac{p2-2q2}{qp} = \sqrt{3}$

$\frac{p^2-2q^2}{qp}$ is a rational number as p and q are integers.

This contradicts the fact that √3 is irrational, so our assumption is incorrect.

Therefore √5 - √3 Is Irrational.

SEC-C
26. The LCM of 24 and 36 can be found LCM = 72. This means that the two bells will toll together every 72 minutes. The bells toll together at 9 am, and the next time they will toll together is after 72 minutes, i.e., at 10:12 am.
27. (x+1)(x—q² /p²)   x= —1 or x = q² /p²

$p(x) = 3x^2 - x - 4 = 3x^2 - 1x - 4$

Comparing with $ax^2 + bx + c$

$\quad a = 3, \quad b = -1, \quad c = -4$

We have to verify

Sum of zeroes $= -\dfrac{Coefficient\ of\ x}{Coefficient\ of\ x^2}$ Product of zeroes $= \dfrac{Constant\ term}{Coefficient\ of\ x^2}$

i.e. $\alpha + \beta = -\dfrac{b}{a}$ i.e. $\alpha \times \beta = \dfrac{c}{a}$

L.H.S	R.H.S	L.H.S	R.H.S
$\alpha + \beta$	$-\dfrac{b}{a}$	$\alpha\beta$	$\dfrac{c}{a}$
$= \dfrac{4}{3} + (-1)$	$= -\dfrac{(-1)}{3}$	$= \dfrac{4}{3} \times (-1)$	$= \dfrac{-4}{3}$
$= \dfrac{1}{3}$	$= \dfrac{1}{3}$	$= \dfrac{-4}{3}$	

29. Let the no be x , yX+y =75   , x-y =15 45,30

30 . Let the total number of red balls initially be x

P(getting a red ball) = x/12

Now, 6 red balls are put in the box, = 18 balls

Then total number of red balls = (x + 6)

P(getting a red ball) = (x + 6)/18   2(x/12) = (x + 6)/18   2x/12 = (x + 6)/18

⇒ 36x - 12x = 72   ⇒ 24x = 72   x = 3

31. In triangle OPQ, AB∥ PQ by BPT 0A/AP = OB/BQ

   In triangle ORQ, AC ∥ PR   by BPT 0A/AP = OC/CR

   OB/BQ = OC/CR   by converse of BPT ,BC ∥ QR

SECTION D

32. (A)Given:- Speed of boat =18km/hr   Distance =24km Let x be the speed of stream.   Let t1 and t2 be
the time for upstream and downstream. ⇒time=distance/speed

$t_1 = t_2 + 1$

$\dfrac{24}{18-x} = \dfrac{24}{18+x} + 1$

$\Rightarrow \dfrac{1}{18-x} - \dfrac{1}{18+x} = \dfrac{1}{24}$

$\Rightarrow \dfrac{(18+x) - (18-x)}{(18-x)(18+x)} = \dfrac{1}{24}$

$\Rightarrow 48x = (18-x)(18+x)$

$\Rightarrow 48x = 324 + 18x - 18x - x^2$

$\Rightarrow x^2 + 48x - 324 = 0$
$\Rightarrow x^2 + 54x - 6x - 324 = 0$
$\Rightarrow x(x+54) - 6(x+54) = 0$
$\Rightarrow (x+54)(x-6) = 0$

$\Rightarrow x = -54\ or\ x = 6$ Thus the speed of stream is **6km/hr**

33.

steps(2m)

(0,5),(-1,7/2) and (1,13/2)[each answer 1m]

34. PROOF(4M)

AD=60cm(1m)

35. Graph(4m)

Soln(1m)

CASE STUDY

36. (i)CENTROID =(17/3,10/3)

(ii) SCALENE

(iii)(11/2,5/2)

37.i) parabolic

  ii)cuts x-axis at (-6,0) and (6, 0). So, the zeroes of polynomial are-6 and 6.

   x^2-36

(iii) f(x)=x^2+2x-3.

38. i) b) 5/36

ii) d) 6/36=1/6

iii) a) 23/36