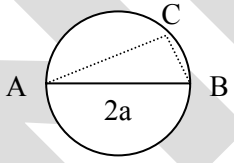
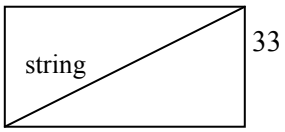
1. (b) $\left(\sqrt{a}+1/\sqrt{a}\right)^2 = 4$
   $a+1/a = 4-2 = 2$
2. (b) $2 + 3 < 6$
3. (a) Minimum number of weighing is three
4. (c) Hourly production by hand = k/q, by machine = k/f
   difference = k/f – k/q = k(q– f)/fq.

5. (c) Burning rates are L/4 and L/3 per hour (L-length)
   Lengths burnt in time T = LT/4 and LT/3
   Lengths remaining are L – (LT/4) and L – (LT/3).
   $L - LT/4 = 3(L - LT/3). \Rightarrow T = 8/3$ hours.
6. (b) For others, consider the cases when both are negative and one negative and one positive.
7. (c) Maximum area is when altitude from C to AB = a (radius)
   Area = 0.5 * base * height



8. (d) Old surface area = $6a^2$
   New surface area = $6*(1.5a)^2 = 13.5a^2$
   Percentage increase=125% {100 * (new – old)/old}.
9. (b) x + y =10/4 x – y = 10/6
   Speed of Nishu, x = 25/12 km per hour
10. (d) The fastest men A gains one round over B in 44 min and over C in 32 min. Therefore they'll be together in 352 min (LCM of 44 and 32). or simply take the LCM of times each take to cover a circle.
11. (d) maximum value of $a\cos\theta + b\sin\theta$ is $\sqrt{a^2+b^2}$ minimum value is $\sqrt{a^2+b^2}$
12. (d) discount = $100[1-(0.9)(0.88)] = 20.8$
13. (a) 47, 53 and 59
14. (d)
15. (b) Resultant of AB and AC by principle of vector addition.
16. (a) Area of each parallelogram is ab (base * height).
    Area of common triangle is ab/2. Hence, $(2-1/2)ab$.
17. (a)
18. (b) 100/20 = 5
19. (d) LCM of 20, 40 and 100 is 200. Therefore after 2 complete rotations of Z (200 teeths covered) they'll be in same position = 5 complete rotations of Y and 10 complete rotations of X.
20. (c) Minute hand gain 55 min over the hours hand in 60 min. At 4 o'clock two hands are at angle 20 degree. Minute hand will gain 20 min over the hours hand in $(20*60)/55 = 240/11$ min.
21. (c) $T_n = 4/9[1-10^{-n}]$
    $\sum T_n = 4n/9 - 2/5$
    as $n \to \infty$. $\sum T_n \to \infty$
22. (a) 23. (b)
24. (b) On opening up the cylinder we get,



25. (c) M – J
    M – H – J, M – V – J, M – U – J
    Between M & J 2 person can come in 3 * 2 = 6 ways
    Between M & J 3 person can come in 2+2+2 = 6 ways
    Total no. of ways = 16