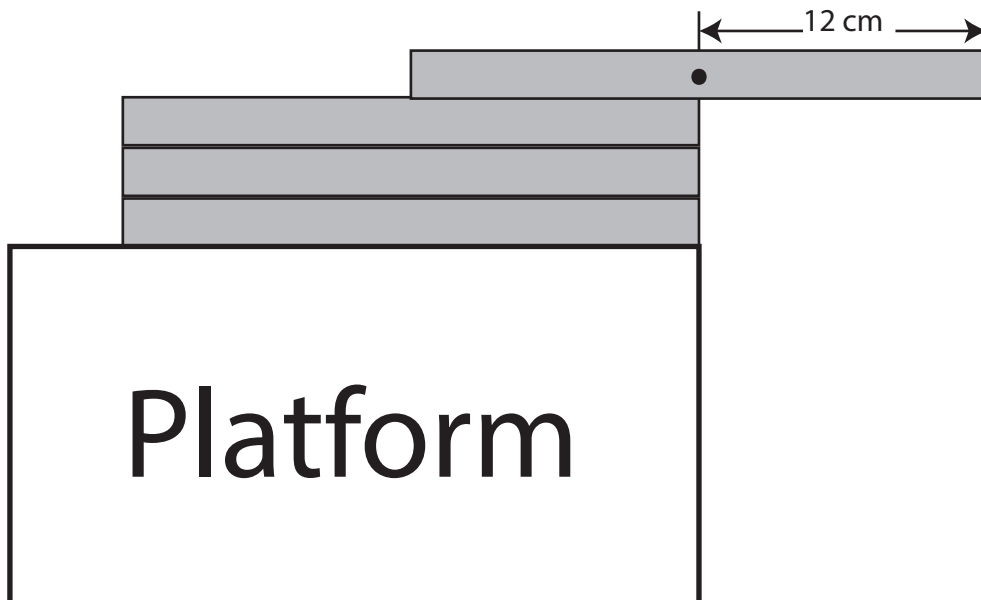


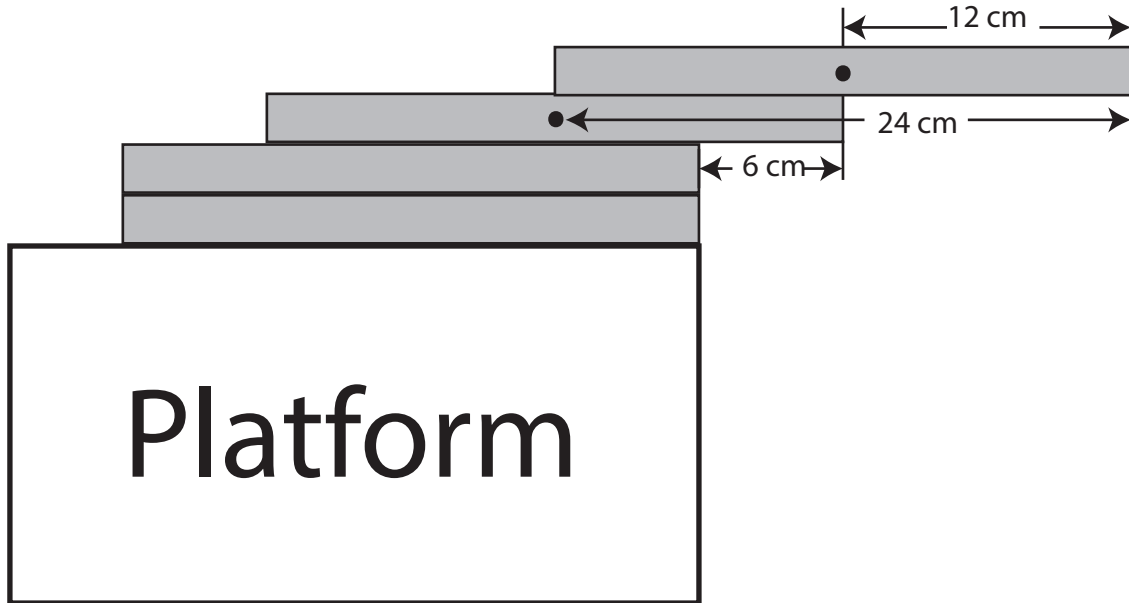
Solution:

Start by placing the plates directly on top of each other with one edge of the plates in line with the edge of the platform. Slide the top plate as far as possible. Next slide the second plate as far as possible. Do the same for the third, and fourth plates.

Let's look at this numerically knowing that the plates are 24 cm square. The main goal is to put the center of gravity right at the end of the platform. The center of gravity of the top plate is 12 cm from it's front edge so we can slide it 12 cm (1/2 of its length).

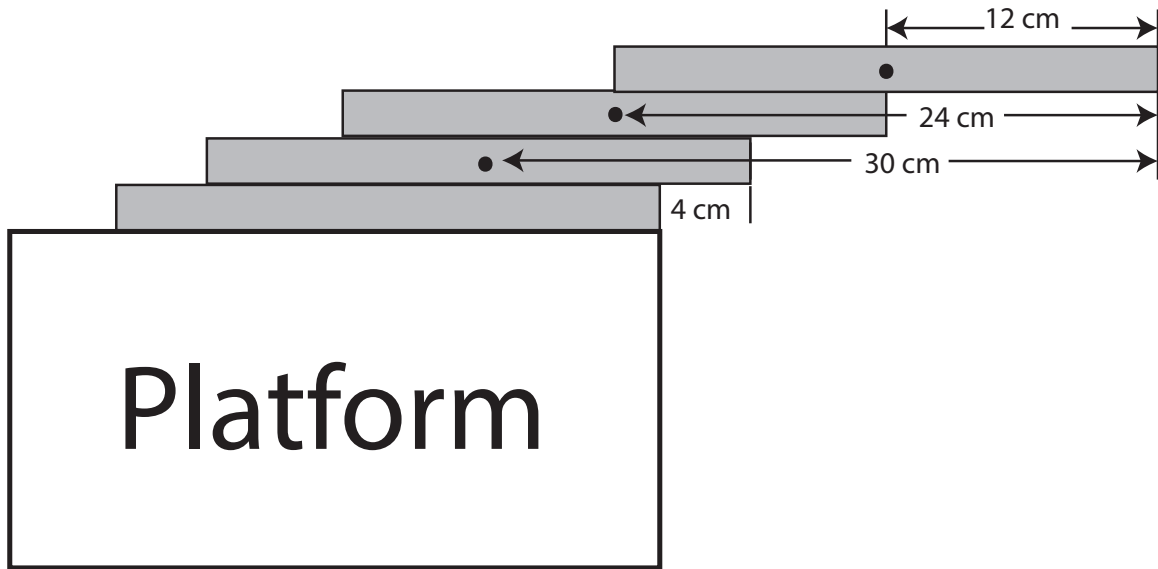


We now look at the center of gravity of the top two plates. The center of gravity of the top plate is 12 cm from its front edge and the center of gravity of the second plate is 24 cm from the front edge of the top plate. Thus, the center of gravity of the top two plates combined is the average of their centers of gravity which is 18 cm from the front edge of the top plate. Hence we can slide the second plate 6 cm ($1/4$ of its length).



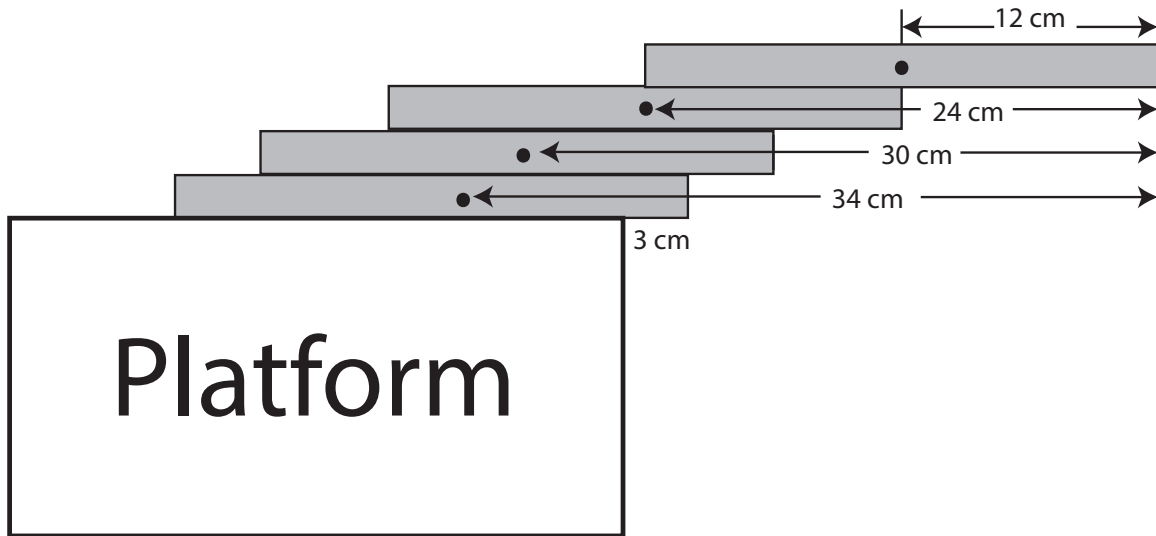
The top plate now has 18 cm beyond the edge of the platform or $3/4 = (1/2 + 1/4)$ of its length.

We now look at the center of gravity of the top three plates. The center of gravity of the top plate is 12 cm from its front edge, the center of gravity of the second plate is 24 cm from the front edge of the top plate and the center of gravity of the third plate is 18 cm from the front edge of the top plate. Thus, the center of gravity of the top three plates combined is the average of the centers of gravity of each plate which is $(12 + 24 + 30)/3$ cm = 22 cm from the front edge of the top plate. Hence we can slide the third plate 4 cm ($1/6$ of its length).



The top plate has now been slid $12 + 6 + 4 = 22$ cm.

We now look at the center of gravity of all four plates. The center of gravity of the top plate is 12 cm from its front edge, the center of gravity of the second plate is 24 cm from the front edge of the top plate, the center of gravity of the third plate is 18 cm from the front edge of the top plate and the center of gravity of the fourth plate is 34 cm from the front edge of the top plate. Thus, the center of gravity of the top four plates combined is the average of the centers of gravity of each plate which is $(12 + 24 + 30 + 34)/4$ cm = 25 cm from the front edge of the top plate. Hence we can slide the fourth plate 3 cm ($1/8$ of its length).



The top plate has now been slid $12 + 6 + 4 + 3 = 22$ cm which places the back edge of the top plate 1 cm beyond the platform.

By moving these plates as described above we have moved the top plate $1/2 + 1/4 + 1/6 + 1/8$ of its length. You may notice that each of the fractions has a common factor of $1/2$. If we factor out the $1/2$ we are left with $= 1/2(1 + 1/2 + 1/3 + 1/4)$. If this pattern is continued with 8 plates then the maximum distance that can be achieved is $1/2(1 + 1/2 + 1/3 + 1/4 + 1/5 + 1/6 + 1/7 + 1/8)$ of its 24 cm length which is about 32.6 cm or 8.6 cm beyond the edge of the platform.

If this pattern is extended, you may notice that we are working with the harmonic series $(1 + 1/2 + 1/3 + 1/4 + 1/5 + \dots + 1/n)$ which does not converge. Even if we multiply this sum by $1/2$ as we have done above, it will still not converge. This means that with the right number of plates, we could extend the top plate to be any distance beyond the end of the platform.

The maximum distance can also be achieved in other creative ways by rotating some of the plates by 45 degrees. This creativity may yield a distance greater than 32.6 cm.