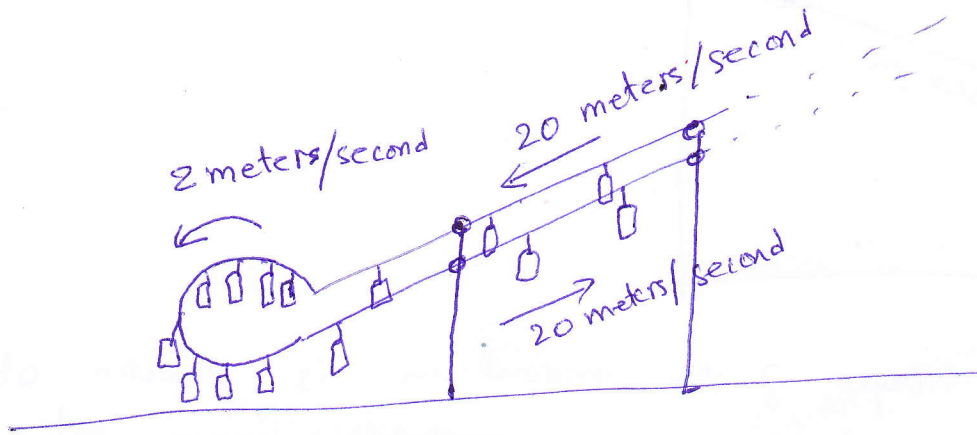


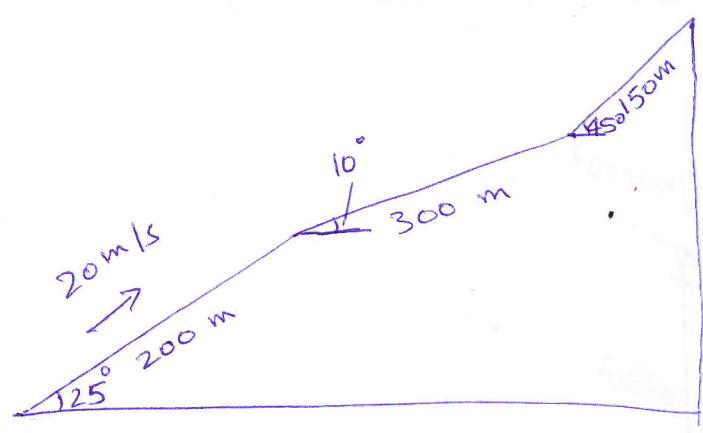
1) A gondola ride is shown here: from Heavenly in Tahoe



(a) The gondolas slow down to 2 m/s at the loop and go at 20 m/s on the slope. Explain why the gondolas coming in at 20 m/s don't end up clogging up the loop.

(b) If the gondolas in the loop were to move at 1.5 m/s , would that lead to clogging up? Why or why not?

2)

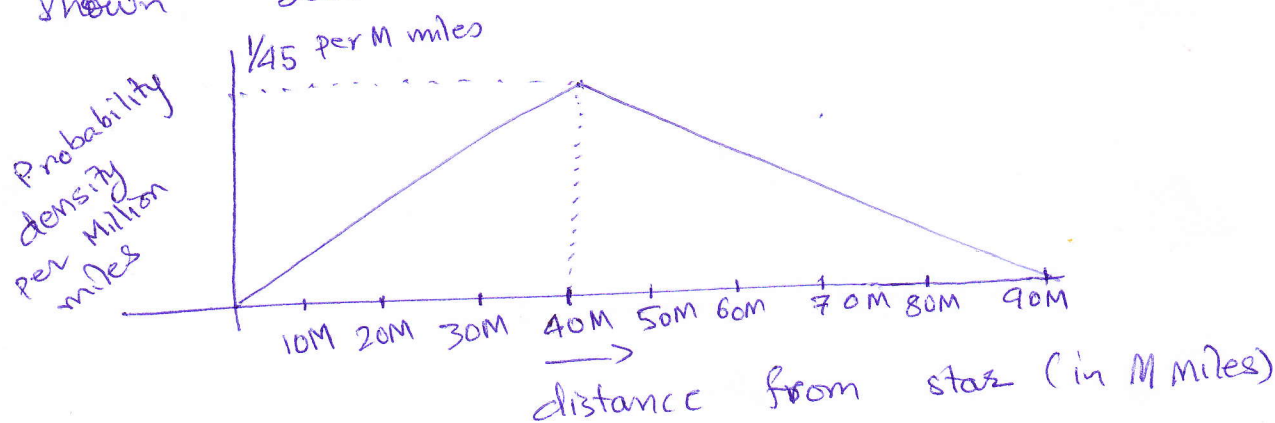


A gondola ride to top of the mountain is shown above with three different sections - the gondolas move at 20 m/s . From 10^{th} second into the ride till 30^{th} second into the ride up, how much height is gained by the gondola?

3) In an alien solar system, there are three planets around the star, with distances from star shown



The probability distribution of alien life existing on a planet with given distance from its star is shown below.



Find the probability that life exists on a planet in this alien solar system.

(Hint it has to do with areas of triangles)
Also, Area under the prob. density curve is 1).

4) There is a 'mind of its own' function $f(x)$ such that

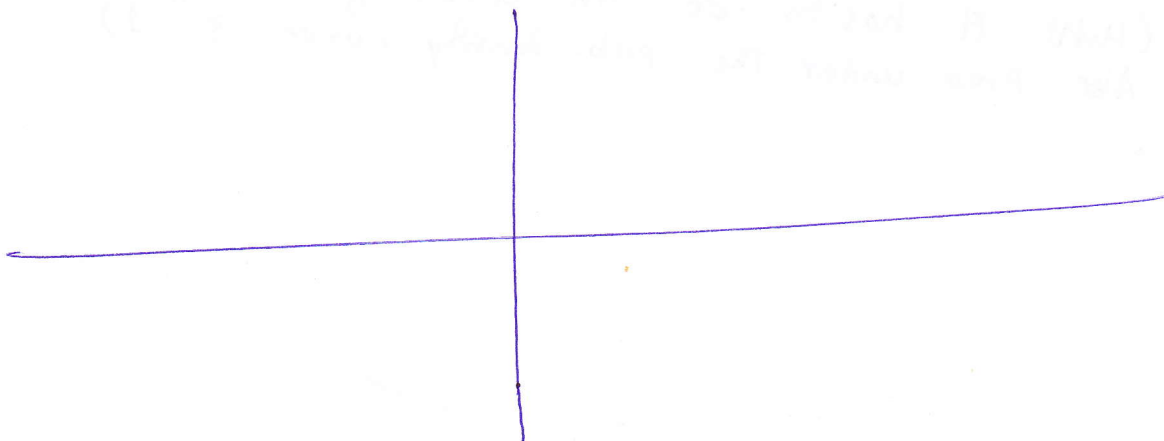
$$f(x-1) = f(x) + 1$$

and it is known that $f(10) = 0$.

(a) Write the equation of $f(x)$ in terms of x and constants.

i.e. if $f(x) = y = mx + c$, find m and c .

(b) Plot the graph of $f(x)$



5)

$$f(\beta) = \frac{-3}{\beta^2} + \frac{10}{\beta} + 5$$

For what values of β is $f(\beta) = 0$?

(Don't simplify radicals)

6) There is a bag with three glass balls. (solid).
The material of the glass is same for all the balls.
The first ball has radius 1 cm, second has radius 2 cm
and third has radius 3 cm. The density of the glass is
 10 gm/cm^3 . If ~~two~~ two balls are picked out of the
bag at random, find the expected weight of the
picked balls (i.e. ^{expected} sum of the weights of 2 balls).