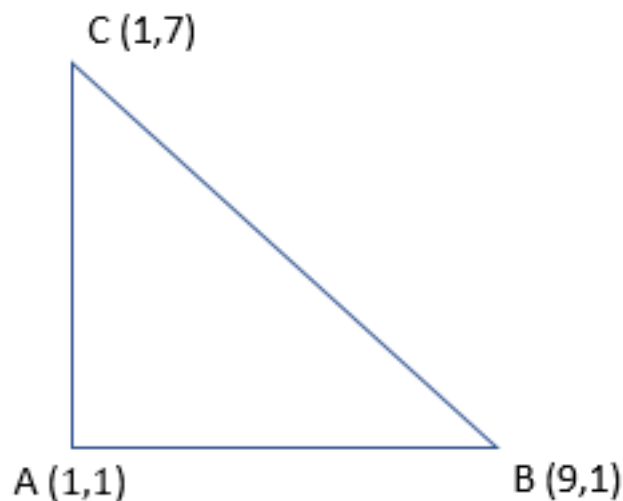
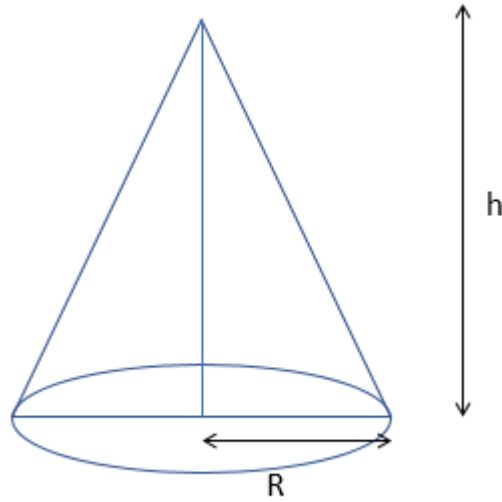


Week - 2
Tutorial
Straight Lines - 1
Mathematics for Data Science - 1

1. A company launches a mobile A and sets the selling price at Rs. 8000 for the month of March 2019. The mobile was sold at that price till Jun 2019. Due to increasing demand, the company decided to increase the price by Rs. 250 each month. A new mobile B with selling price of Rs. 6000 came in market in January 2020. Because of this, the selling price of A dropped down at a rate of Rs. 500 per month from January till it became constant in March 2020.
 - (a) Draw a clear graph of mobile A's price (vertical axis) versus month (horizontal axis).
 - (b) What was the price of mobile A in December?
 - (c) Calculate the slope of mobile A's price from January to March 2020.
 - (d) Calculate the price of mobile A in March 2020.
2. A farmer has a triangular field ABC as shown in figure below. If watering costs Rs. 10 per unit square, how much would he have to pay for whole field? If the fencing wire around the field costs Rs.5 per unit, how much would he have to pay for three rounds of fencing around his field?



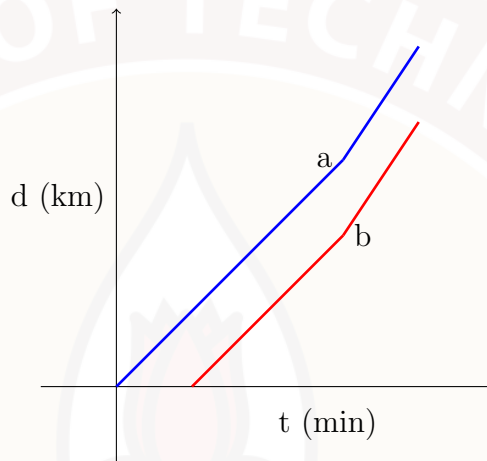
3. Two friends Abdul and Ram started from positions $(-2,2)$ and $(4,10)$ respectively towards each other to meet at position P. If their speeds are 60 km/hr and 90 km/hr respectively and meet in 4 minutes at point P. Find the position of P, given that one unit distance is equal to 1 km.
4. A line is represented by $7y = 56 - 8x$. If the mirror image of this line is taken with respect to $Y - axis$, a new line is formed. What will be the equation of new line? If A is the set of all elements inside the area enclosed by these two lines and the $X - axis$ then answer the following.
 - (a) What is the set of $y - coordinates$ of the points in set A ?
 - (b) What is the set of $x - coordinates$ of the points in set A ?
5. Mary subscribed to a cell phone plan with 400 free minutes, a Rs. 50 monthly fee, and 20 paise for each additional minute. What is her bill amount when she uses 700 minutes per month?
6. The coordinates of two points K, L, M , and N are $(-4,4)$, $(6.5,6.5)$, $(2,-2)$, and $(-5,-5)$ respectively. R is the point of intersection of KM and LN , and is known to cut the line segment KM in the ratio $KR : RM = 4 : 2$. Let two points P and Q has coordinates as $(4,0)$ and $(0,-7)$ respectively. Then choose the correct options.
 - ☐ RP and RQ are parallel.
 - ☐ RP and RQ are perpendicular.
 - ☐ Adequate information for finding the relation between RP and RQ .
 - ☐ $\angle LRP + \angle PRM = 90^\circ$
 - ☐ $\angle LRP + \angle PRM = 180^\circ$
 - ☐ Adequate information for finding the relation between $\angle LRP$ and $\angle PRM$.
 - ☐ None of the above.
7. Two points O and P have their coordinates $(0,0)$ and $(7,3)$ respectively. Line segment OP is rotated by 360 degrees around the $X - axis$. A cone is shown below in figure. If the volume of the cone is given as $V = \frac{1}{3} \times \pi \times R^2 \times h$, then answer the followings. (for calculation use the value of π to be $\frac{22}{7}$)



- (a) What will be the volume of cone generated by the rotation of line segment OP ?
 - (b) If rotation is done around Y - axis rather than X - axis then what will be the volume of cone?
8. Sanya hears a sound in the night and comes out to her balcony which is at a height of 80 feet from the ground. She uses a torch-light whose rays make angles between θ and α with the ground. There are two thieves with heights of 5.3 ft and 5 ft standing at distance of 37.5 ft and 50 ft respectively away from the building.
 - (a) If $\tan \theta = 2$ and $\tan \alpha = 16/9$, can Sanya see any of the thieves?
 - (b) If she moves her torch so that she can see the ground from a distance of 48 ft, can she see any of the thieves now?

9. Suresh and Ramesh are colleagues. Their office starts at 9.30 AM. Suresh starts to office at 08:50 AM, and Ramesh starts at 09:00 AM. They both travel at 60kmph. At 09:20 they found that they need to increase their speeds to reach office on time. They increased their speed by 30 kmph each and they reach office on time. If the timer begins at 8:50 AM then answer the following.

- (a) Observing the following graph of their distance travelled vs time, choose the correct option.



- ☐ Path a belongs to Suresh and path b belongs to Ramesh.
 - ☐ Both the paths belong to Suresh.
 - ☐ Path a belongs to Ramesh and path b belongs to Suresh.
 - ☐ Both the paths belong to Ramesh.
 - ☐ Neither path a nor path b belongs to Ramesh.
 - ☐ Neither path a nor path b belongs to Suresh.
- (b) Choose the correct option regarding the final position (t, d) of Ramesh and Suresh respectively.
- ☐ (4,4.5) and (3,3.5).
 - ☐ (40,45) and (30,35).
 - ☐ (40,35) and (40,45).
 - ☐ (30,45) and (40,35).
 - ☐ (4,45) and (30,35).
 - ☐ None of the above.