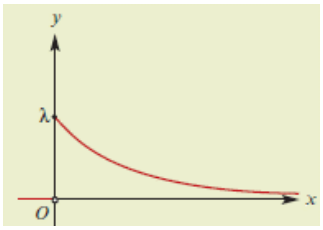
Week 13
Term 4
2023

HAWKER COLLEGE
Engage | Inspire | Achieve

Learning Brief
SM4

Goals



Topic 1: Integration and applications of integration

This week:

Applications of integral calculus:

- use and apply the probability density function, $f(t) = \lambda e^{-\lambda t}$ for $t \geq 0$, of the exponential random variable with parameter $\lambda > 0$, and use the exponential random variables and associated probabilities and quantiles to model data and solve practical problems.

Theoretical Components

Read the notes and study the examples.
(Classroom/ABOUT/Resources/WK06)

Further notes/examples:

https://tutorial.math.lamar.edu/classes/calcii/probability.aspx

https://amsi.org.au/ESA_Senior_Years/PDF/ExpoNormDist4f.pdf

Calculator Applet:

https://homepage.divms.uiowa.edu/~mbognar/applets/exp-like.html

Key Points:

- The **exponential distribution** is often concerned with the amount of time until some specific event occurs.
- The random variable for the exponential distribution is continuous and often measures a passage of time.
- The exponential distribution is often used to model the longevity of an electrical or mechanical device.
- The **memoryless property** says that knowledge of what has occurred in the past has no effect on future probabilities.

Practical Components

Exercises:

Attempt all questions from here:

- See WK06 folder in Google Drive. Attempt all the questions.

Investigation

None this week.

QFO

Quiz/Forum/Other

Video: https://www.probabilitycourse.com/videos/chapter4/video4_8.php