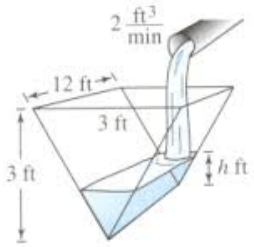
Week 6
Term 4
2020

HAWKER COLLEGE
Engage | Inspire | Achieve

Learning Brief
SM4

Goals



By the end of this unit, students:

- understand the concepts and techniques in applications of calculus and statistical inference
- apply reasoning skills and solve problems in applications of calculus and statistical inference
- communicate their arguments and strategies when solving problems
- construct proofs of results
- interpret mathematical and statistical information and ascertain the reasonableness of their solutions to problems.

This week:

Rates of change and differential equations

- use implicit differentiation to determine the gradient of curves whose equations are given in implicit form
- Related rates as instances of the chain rule: $\frac{dy}{dx} = \frac{dy}{du} \times \frac{du}{dx}$

Theoretical Components

Read the notes and study the examples.

Implicit Differentiation:

- Notes and Examples - https://goo.gl/eAJdRB

Video Tutorial:

- https://goo.gl/DlT4Rp
- https://goo.gl/gBsZkY

Related Rates:

Video Tutorial:

- https://goo.gl/vAgQCr
- https://goo.gl/R1dY6V
- https://goo.gl/jADSIO
- https://goo.gl/WwtnMh
- https://goo.gl/qFroiw
- https://goo.gl/spzYPt

Practical Components

Exercises: available in Google Classroom/ABOUT/Resources/S2/Term3/WK06

Set 1 – Exercises on Implict Differentiation

Set 2 – Exercises on Related Rates

Check your answers here: https://bit.ly/2P6Aig7

Investigation

Mr James Bond, with a powerful spyglass is in a boat anchored 400m offshore.
A gangster under surveillance is working along the shore.
Assuming the shoreline is straight, and that the gangster is walking at a rate of 2 km/h, how fast must Mr James Bond rotate the spyglass to track the gangster when the gangster is 1km from the point on the shore nearest to the boat.

Convert your answer to degrees/min.

20 marks

Q/F/O
Quiz/Forum/Other

WK06 FRI: In-Class – will be on Techniques of Integration, Area and Volumes. Start your preparation by attempting questions under the Test 1 folder (GoogleClassroom/ABOUT/SEM2).