

SHEET 1

PENANG SANGAM HIGH SCHOOL

P. O. BOX 44, RAKIRAKI

LESSON NOTES - 13

SCHOOL: PENANG SANGAM HIGH

SUBJECT: TECHNICAL DRAWING

YEAR/ LEVEL: 11 C/D

Strand	TD11.1. GEOMETRY
Sub - Strand	TD11.1.3 CAMS
Content Learning Outcome	TD11.1.3.1 Recognize and construct the profile of cams on a pointed

CAM

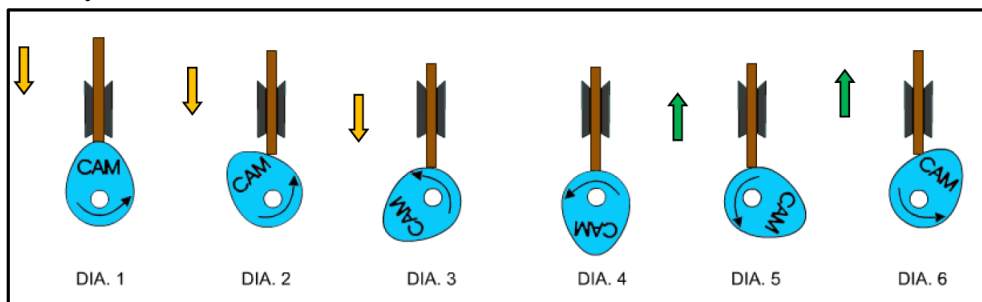
By the end of this topic, students will:

- Learn the terms and parts of a CAM with point/knife follower.
- Construct displacement graph of uniform velocity.
- Construct displacement graph of simple harmonic motion.
- Construct displacement graph of uniform acceleration and retardation.

INTRODUCTION

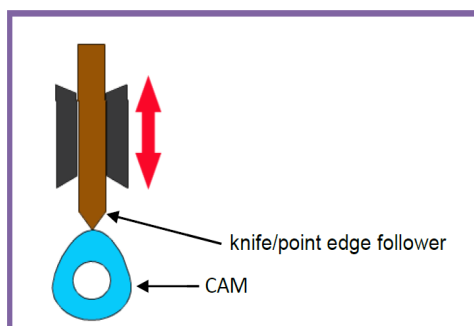
A Cam is a machine component that either rotates or moves back and forth (reciprocates) to create a prescribed motion in a contacting element known as a follower.

A CAM has two parts, the FOLLOWER and the CAM PROFILE. Diagrams one to six show a rotating cam pushing a follower up and then allowing it to slowly fall back down.



TYPES OF FOLLOWER

There are different types of follower but they all slide or roll on the edge of the cam. We will look at knife/point edge follower in this lesson.



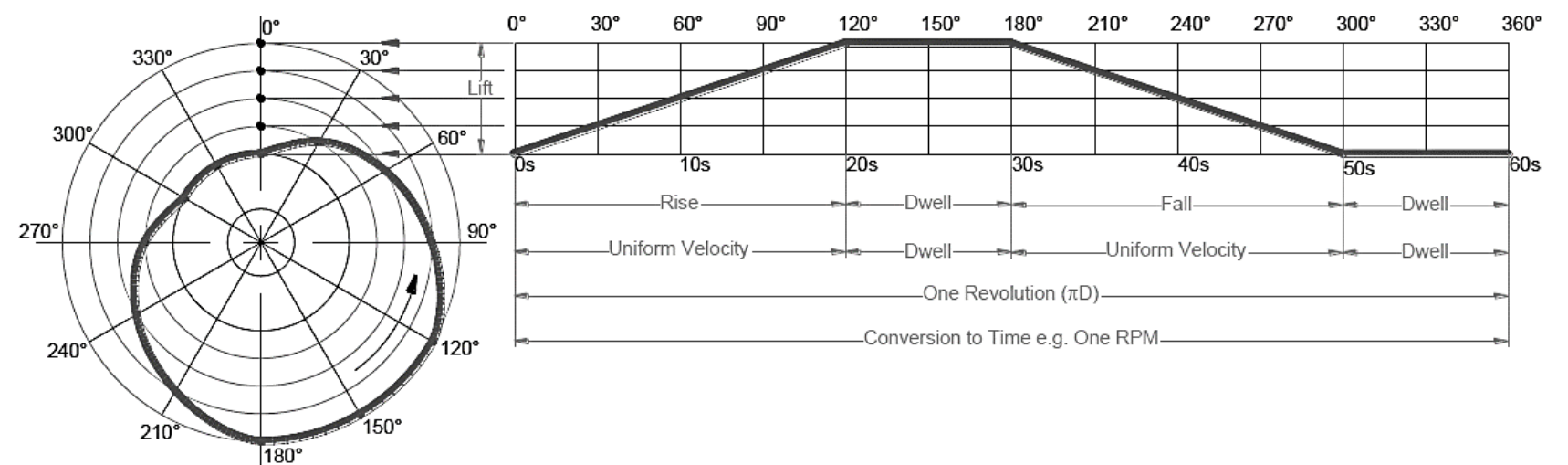
BASIC DISPLACEMENT DIAGRAM

One Cycle - One rotation/revolution of the cam.

Dwell - when the cam rotates but the follower does not rise or fall.

The Rise - part of the cam that causes the follower to rise.

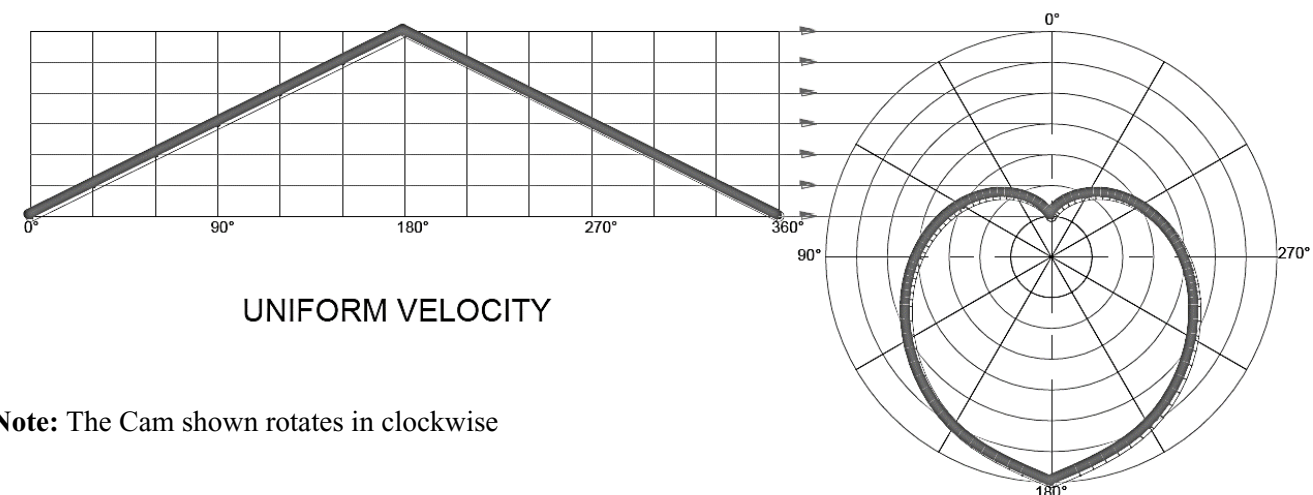
The Fall - part of the cam that causes the follower to fall.



- The performance graph of a plate cam is drawn above showing the rise, dwell, fall and lower dwell.
- The graph is in degrees or in terms of time which is calculated by using one rotation or rpm.
- The points of the graph are projected to the centre line of the disc and brought to the corresponding radial.
- These points are joined to give the contour of the cam.

Uniform Velocity – lifts or falls which follow a straight line on the graph.

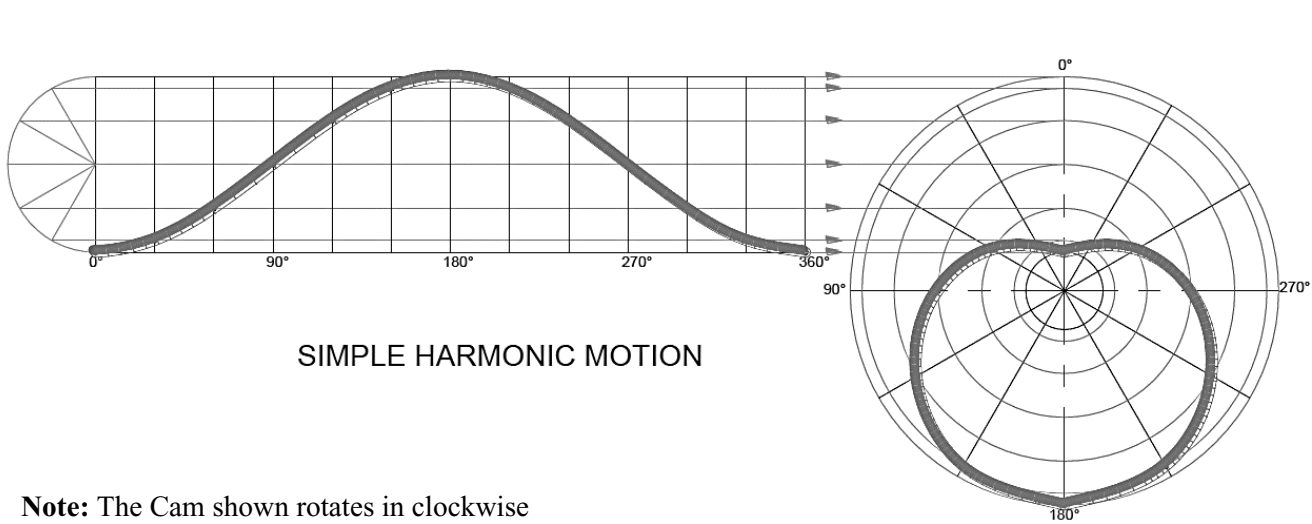
The cam shown would give a uniform velocity rise and fall of its follower.



Note: The Cam shown rotates in clockwise

SHEET 2

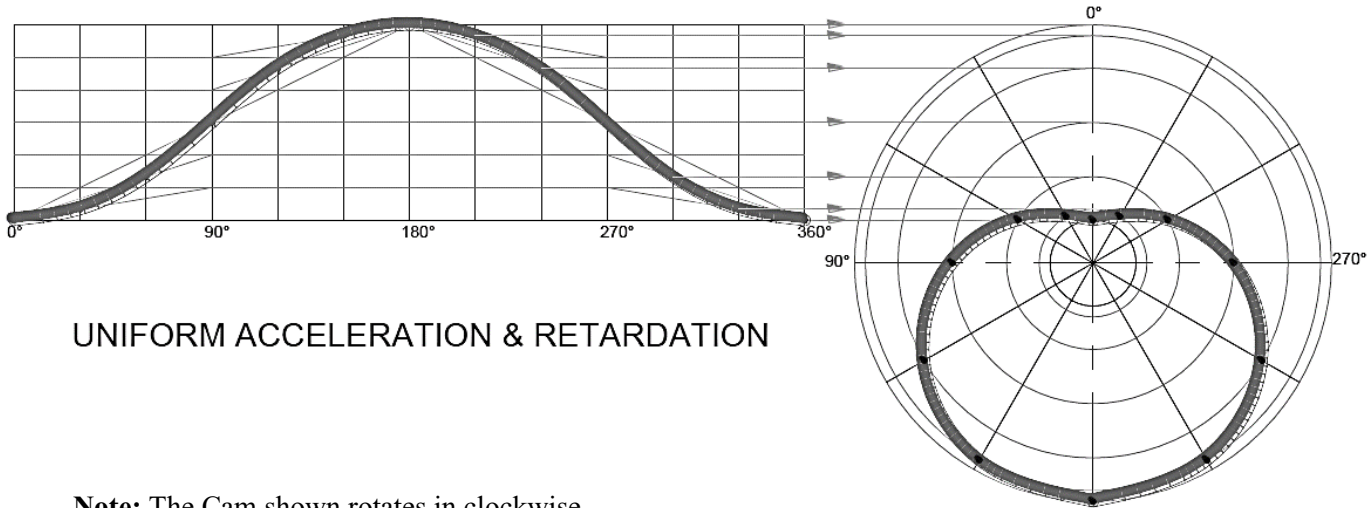
Simple Harmonic Motion – sine curve, constructed by projecting points from the semi-circle to the graph lines.



SIMPLE HARMONIC MOTION

Note: The Cam shown rotates in clockwise

Uniform Acceleration and Retardation – drawn by fixing apex, base and midpoints and in the quarters as shown. The curve is drawn the intersections.



UNIFORM ACCELERATION & RETARDATION

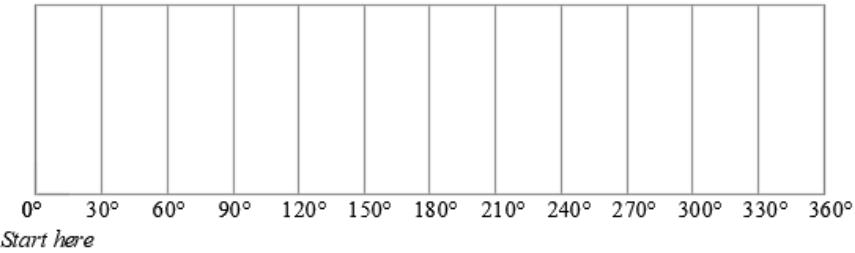
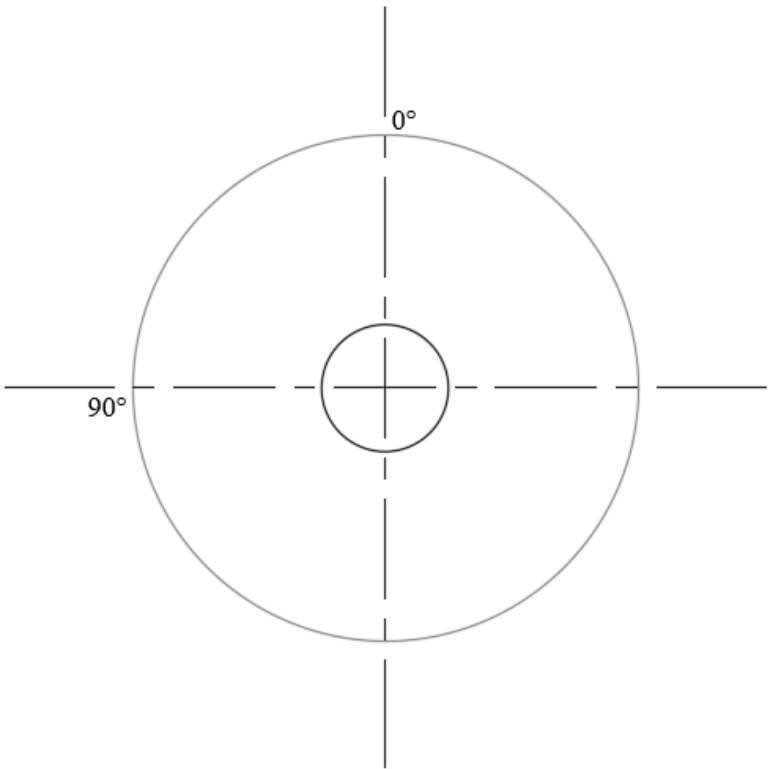
Note: The Cam shown rotates in clockwise

QUESTION 1

A disc which has been mounted on a shaft was used to lift a knife ended follower.
Required: Sketch a Knife ended follower.

QUESTION 2

Given: Design a Cam to fulfill the conditions of the given data.
Required: Draw the graph of uniform velocity rise for 120°, Dwell for next 120° and uniform velocity fall for the rest.



SHEET 3

THE END