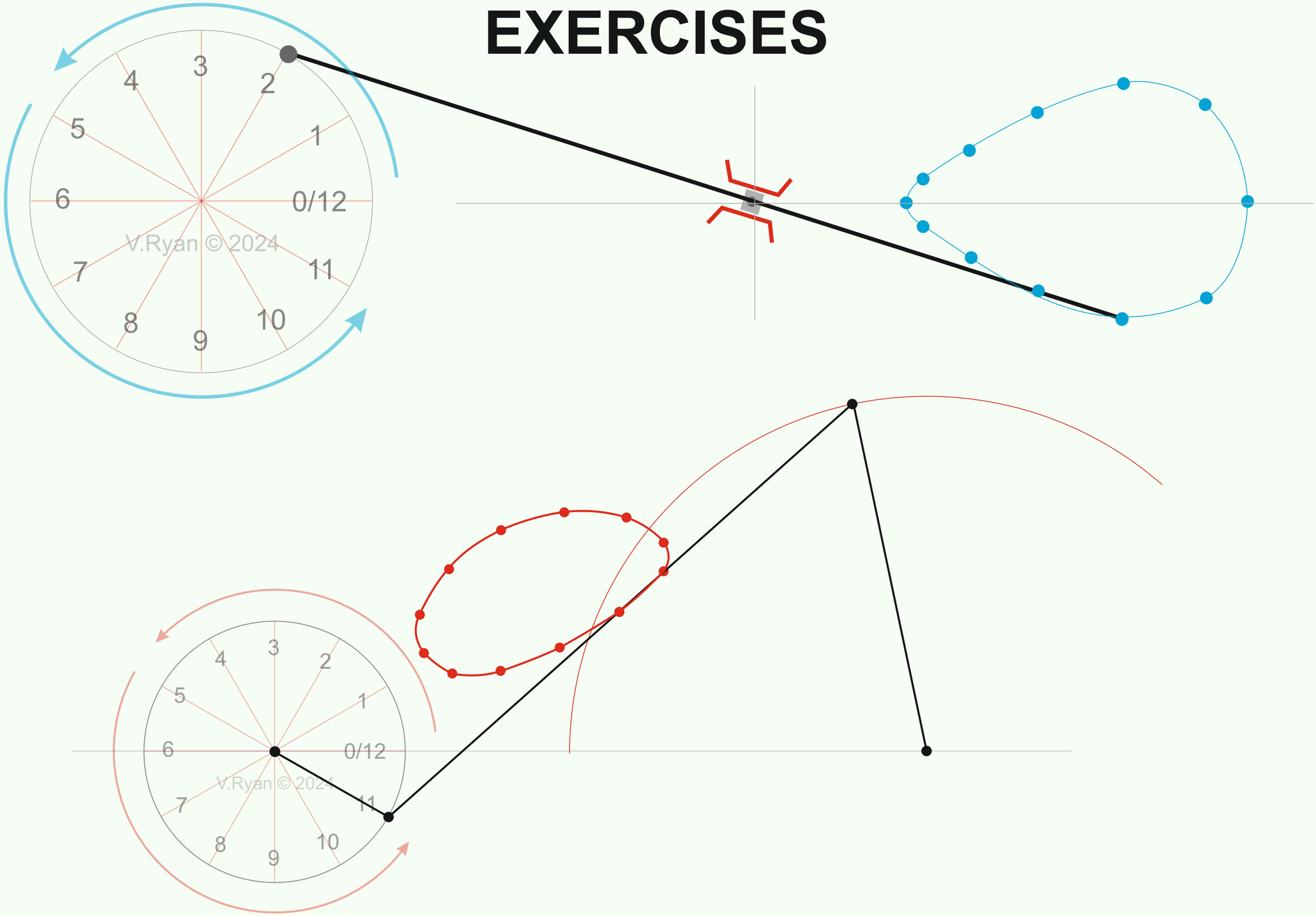
# LOCI and LINKAGES



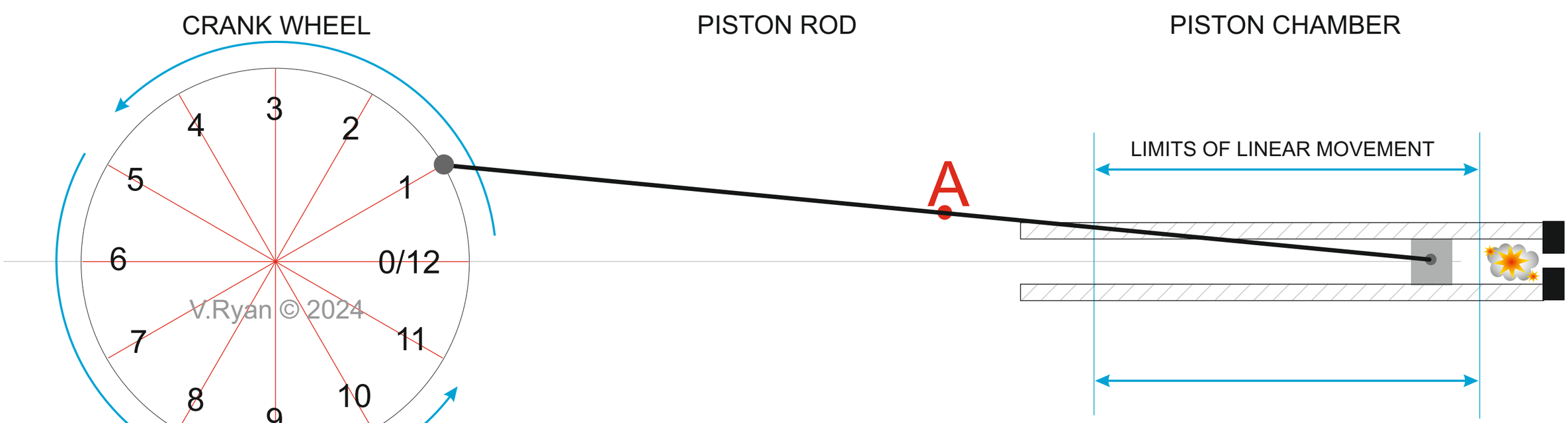
## EXERCISES



# LOCI



**QUESTION** **As fuel in the piston chamber ignites, the piston rod is pushed forward. In turn, the rod forces the crank wheel to rotate in an anti-clockwise direction. For each rotation, fuel is injected into the piston chamber and ignites. This is repeated, ensuring the crank wheel rotates continually. Point 'A' has been marked on the piston arm. The path this point creates as it moves, is called the 'locus'. Draw the locus for point 'A', for one revolution of the fly wheel.**




**What is the 'locus of a point'? Write your own definition.**

**When designing a machine or mechanical device, an understanding of Loci is important. Why?**

HELPFUL LINK

HELPFUL LINK: https://technologystudent.com/despro_3/linkage1.html

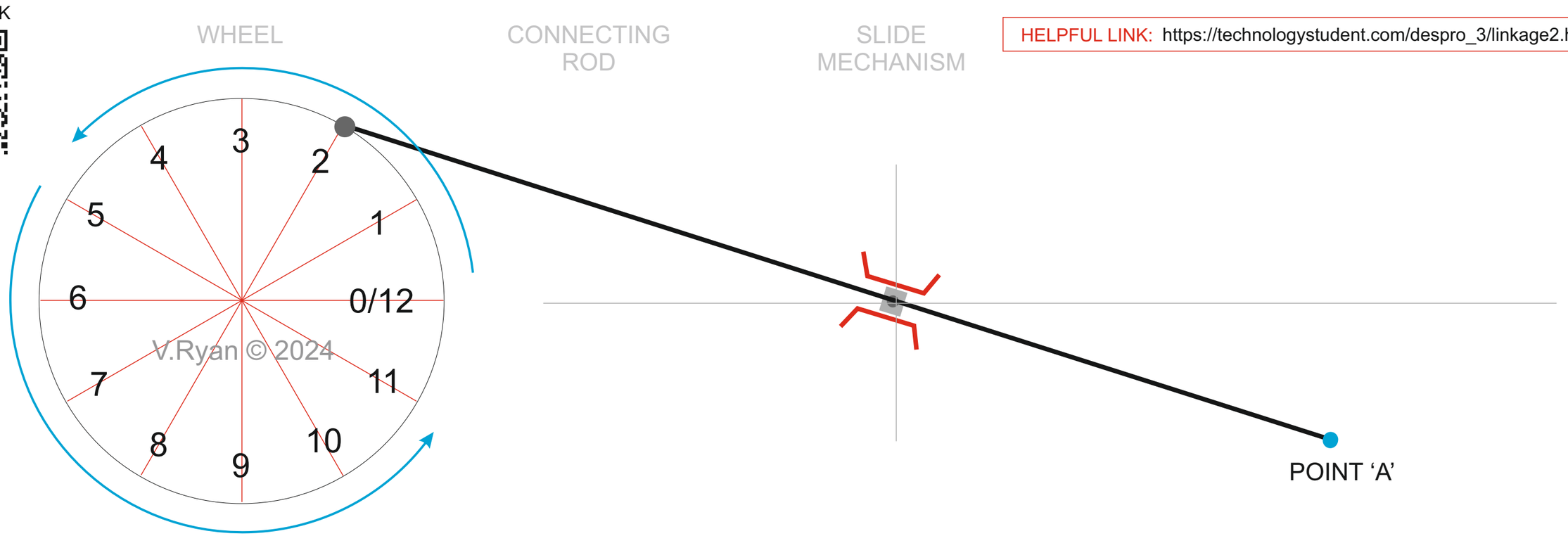
# LOCI

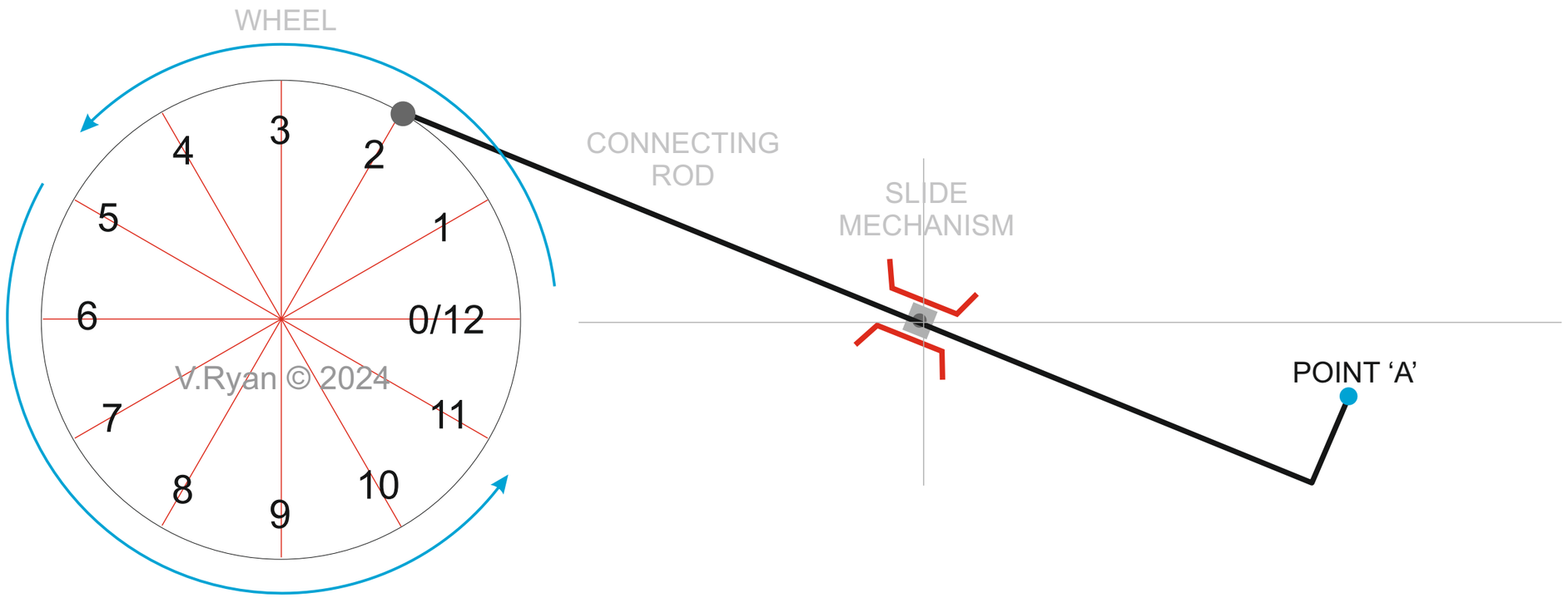


**QUESTIONS** **The linkage mechanisms seen below, are each part of a mechanical device comprised of a rotating wheel, a slide mechanism and a connecting rod'. Draw the locus of point 'A' as the wheels rotate for one revolution.**

HELPFUL LINK

HELPFUL LINK: https://technologystudent.com/despro_3/linkage2.html




NOTE: THE CONNECTING ROD IN THIS QUESTION, HAS A 90 DEGREE BEND

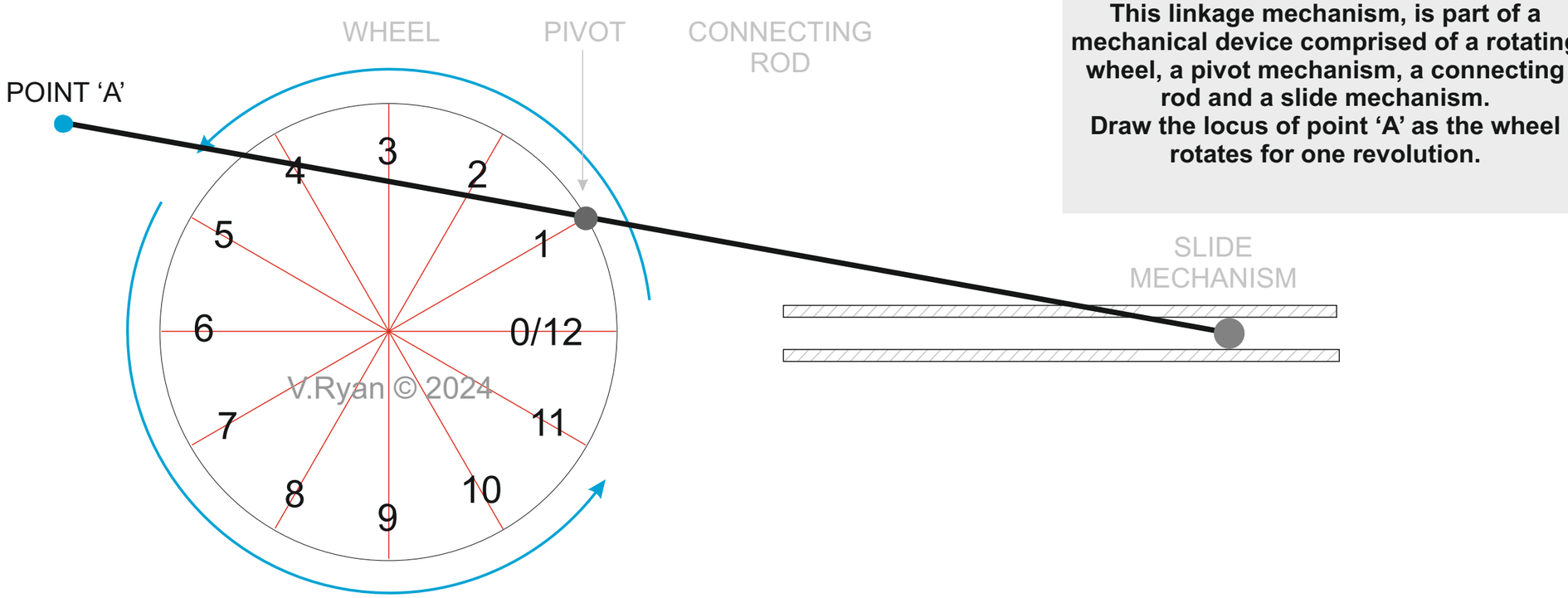
# QUESTIONS

# LOCI



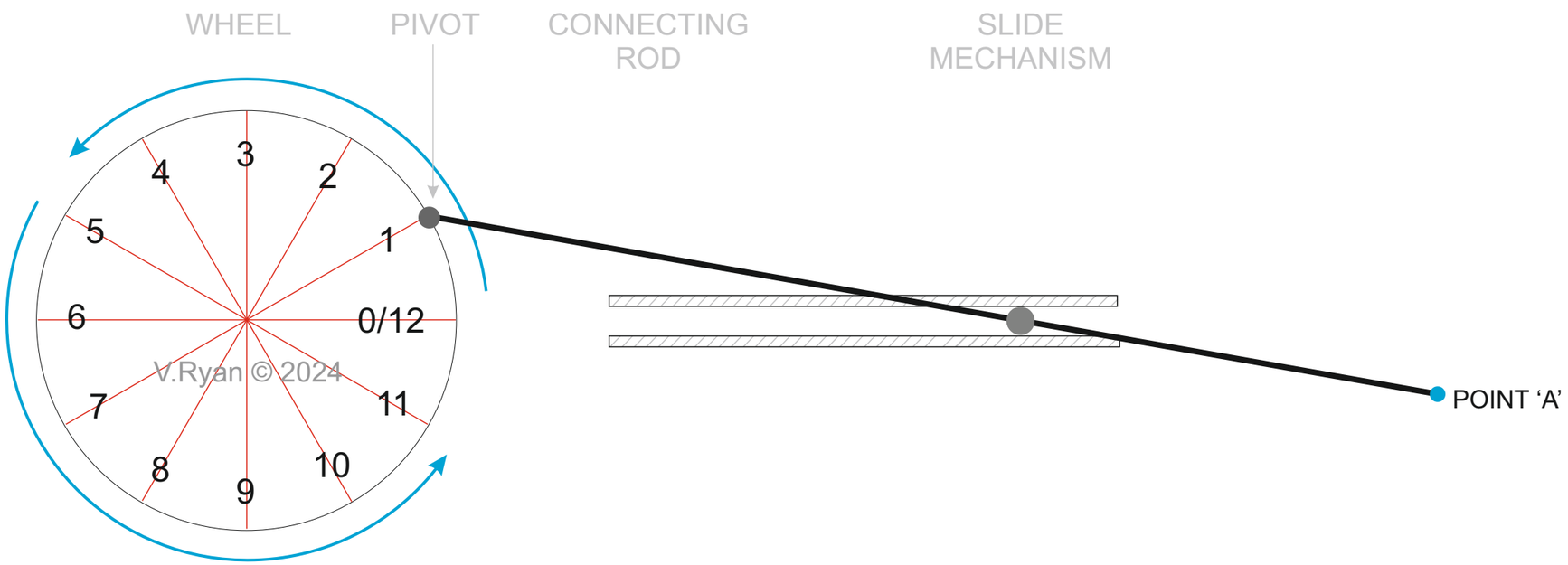
## QUESTION A

**This linkage mechanism, is part of a mechanical device comprised of a rotating wheel, a pivot mechanism, a connecting rod and a slide mechanism.**
**Draw the locus of point 'A' as the wheel rotates for one revolution.**




## QUESTION B

**The linkage mechanism seen opposite, is part of a mechanical device comprised of a rotating wheel, a pivot mechanism, a connecting rod and a slide mechanism.**
**Draw the locus of point as the wheel rotates for one revolution.**



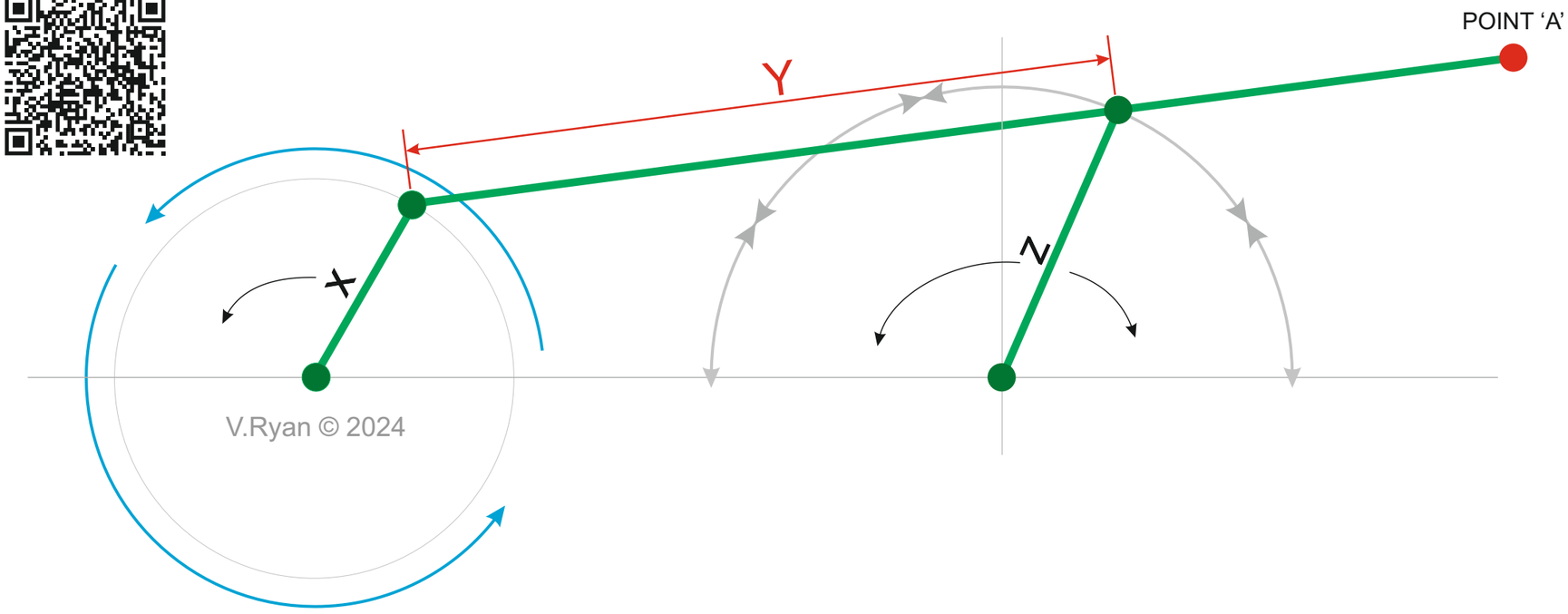

HELPFUL LINK: https://technologystudent.com/despro_3/linkage3.html

# LOCI - LINKAGES



HELPFUL LINK

HELPFUL LINK: https://technologystudent.com/despro_3/linkage4.html




## QUESTION

**A LINKAGE MECHANISM FOR A MACHINE IS SEEN OPPOSITE.**

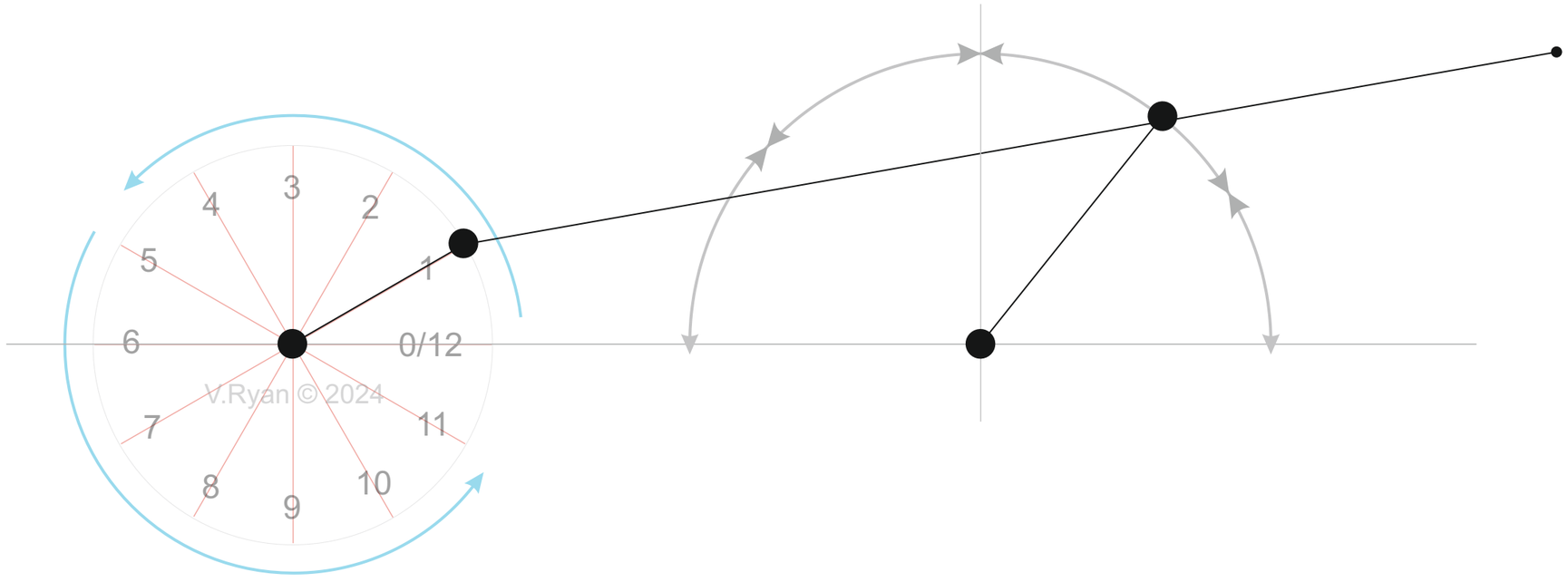
**ARM 'X' REVOLVES IN AN ANTI-CLOCKWISE DIRECTION, SHOWN BY THE CIRCLE.**

**ARM 'Z' MOVES ALONG THE PATH OF AN ARC.**

**DISTANCE 'Y' ALWAYS REMAINS THE SAME.**

**PLOT THE LOCUS / PATH OF POINT 'A'. DRAW YOUR ANSWER ON THE DIAGRAM BELOW**

DRAW YOUR ANSWER USING THE DIAGRAM BELOW



# QUESTION

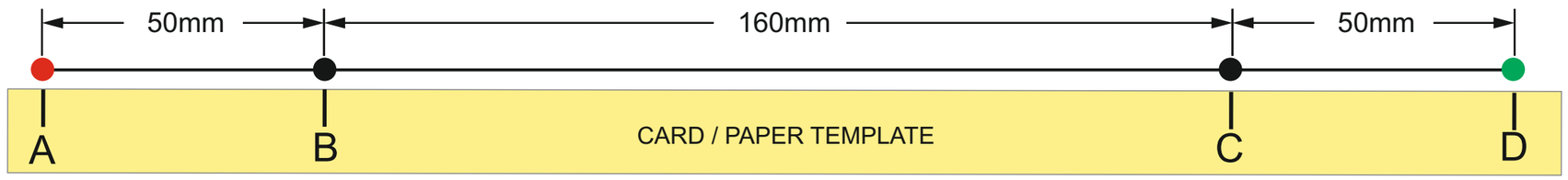
# LOCI - LINKAGES



**THE MECHANISM BELOW IS PART OF THE INTERNAL MOVEMENT OF A MACHINE. CRANK 'X' ROTATES CLOCKWISE. CRANK 'Y' ROTATES ANTI-CLOCKWISE. PLOT THE LOCUS FOR POINTS 'A' AND POINT 'B'.**

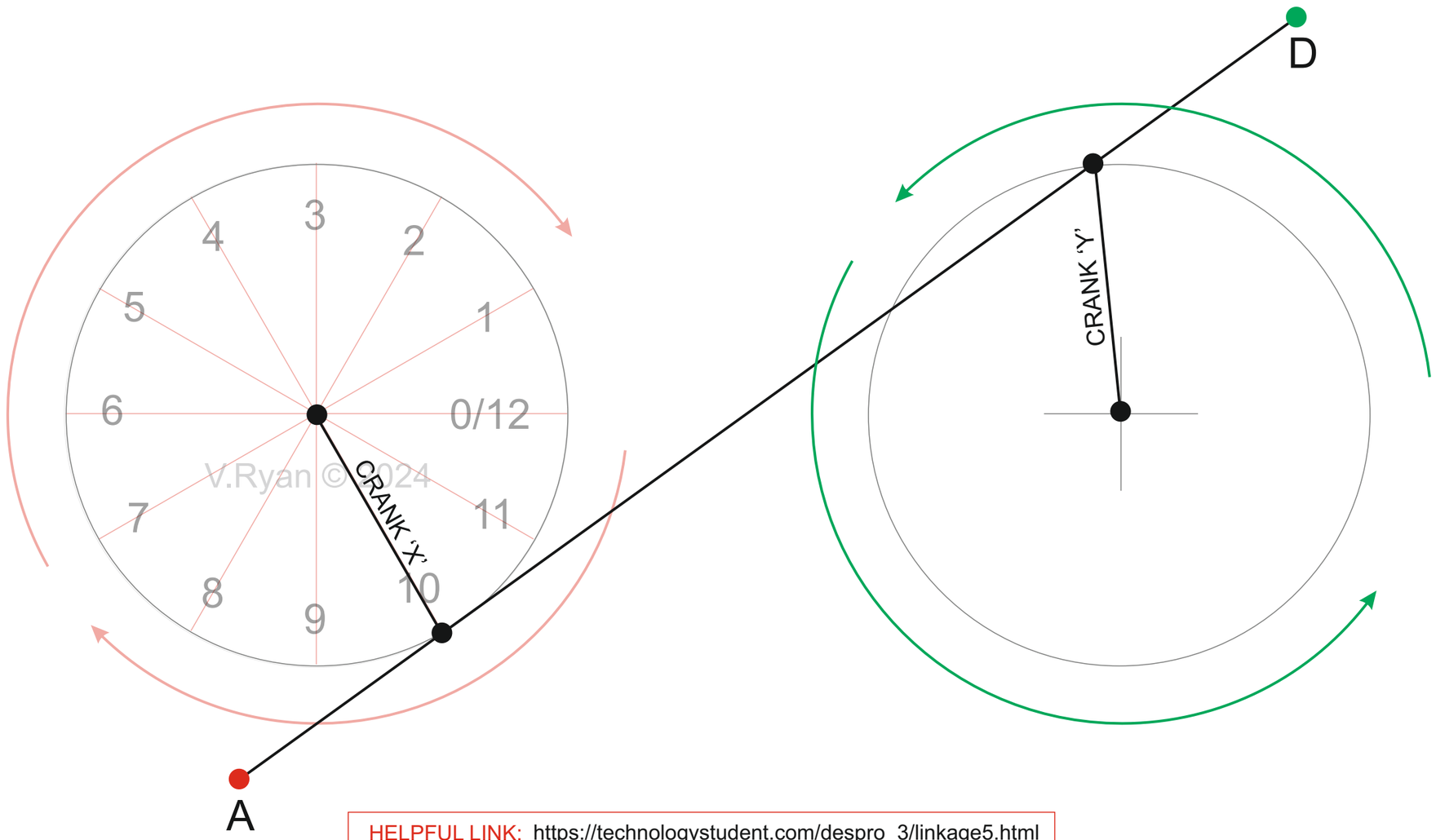
**To start answering the question: On a strip of card / paper, draw a 'template' to the measurements shown below. This can be used to plot the loci for 'A' and 'B'.**

HELPFUL LINK




CLOCKWISE

ANTI-CLOCKWISE




HELPFUL LINK: https://technologystudent.com/despro_3/linkage5.html

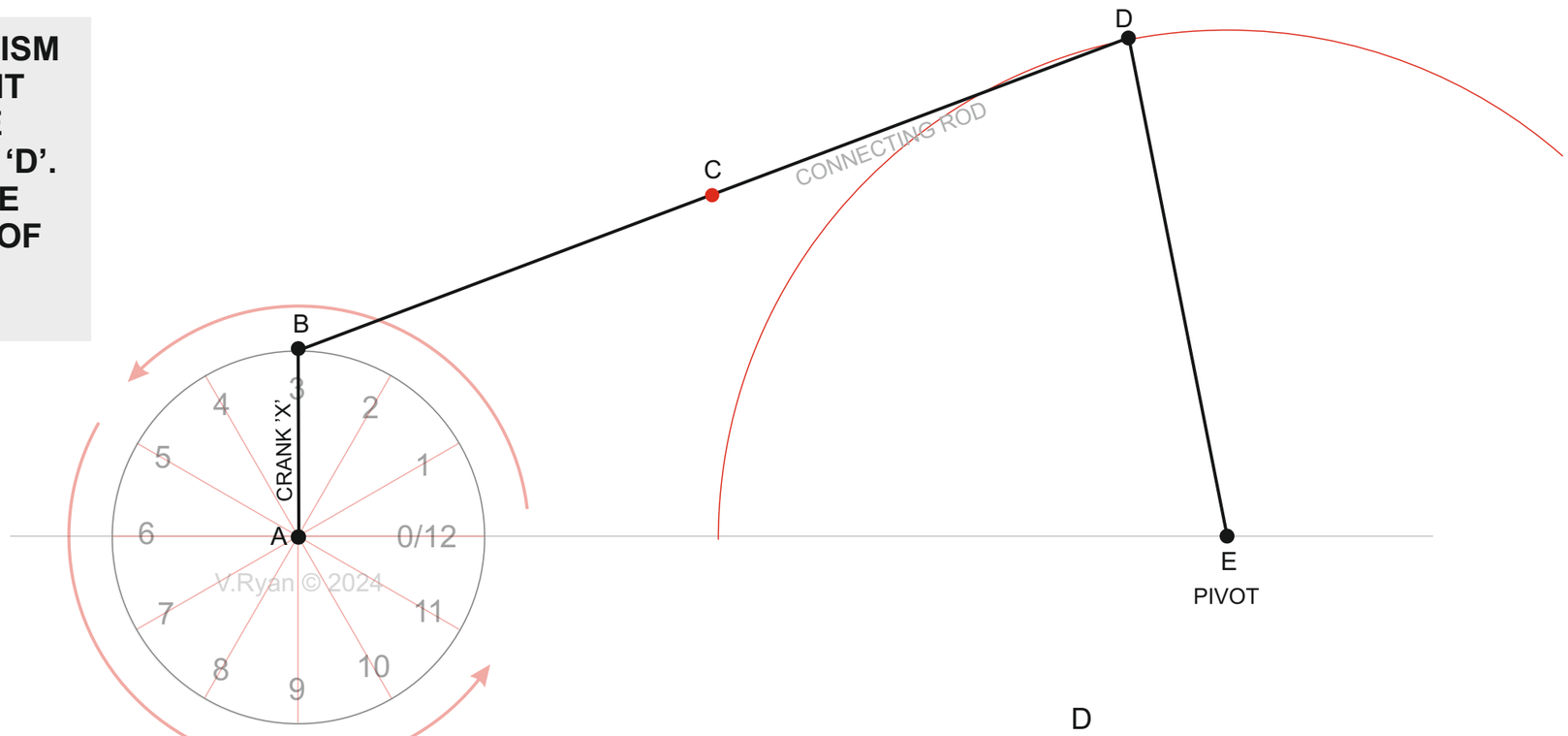
# QUESTION

# LOCI - LINKAGES



**CRANK 'X' FORMS A VITAL PART OF A MECHANISM INSIDE A MACHINE. AS CRANK 'X' ROTATES, IT PULLS THE CONNECTING ROD WITH IT. THE CONNECTING ROD 'HINGES' AT POINTS 'B' and 'D'. IT IS PIVOTED AT POINT 'E'. PLOT / DRAW THE 'LOCUS' OF POINT 'C' FOR ONE REVOLUTION OF THE CRANK.**

## QUESTION A




HELPFUL LINK

HELPFUL LINK: https://technologystudent.com/despro_3/linkage6.html

## QUESTION B