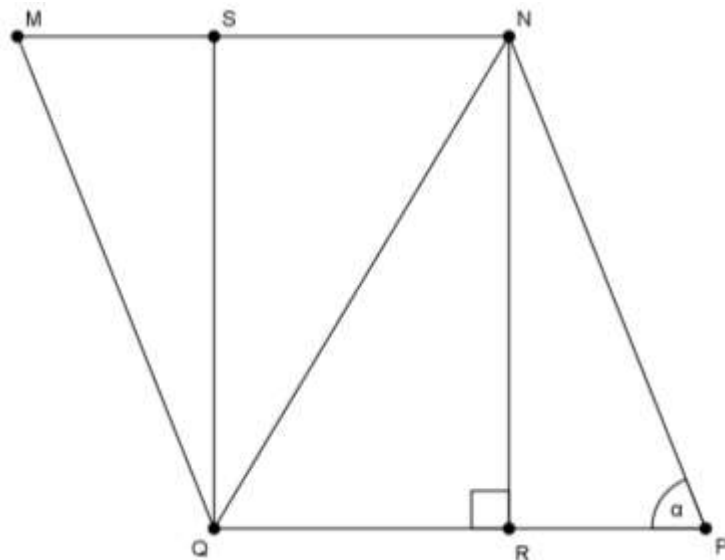


SHARP

Worksheet 16: More Euclidean Geometry

Grade 10 Mathematics

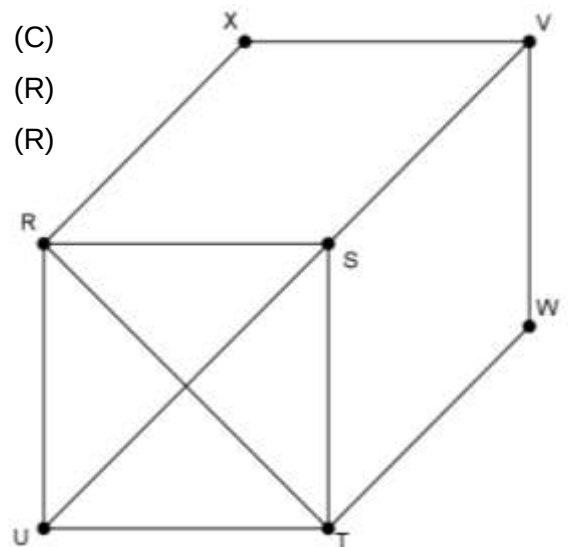
1. Given below is the diagram of parallelogram MNPQ. $NR \perp QP$ and $\angle N\hat{P}R = \alpha$.



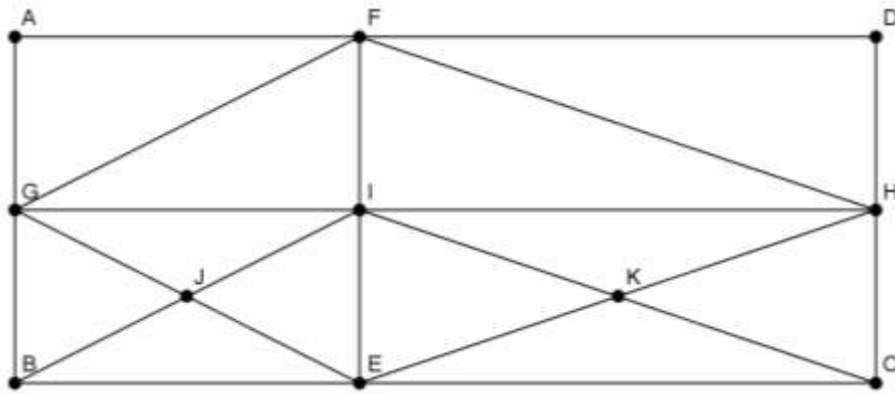
- Prove that $\triangle MQN \equiv \triangle NPQ$ (R)
- Hence prove that $\triangle MSQ \equiv \triangle PRN$ (C)
- Prove that NRQS is a rectangle. (C)
- What kind of shape is SNPQ, give reasons for your answer. (C)

2. In the diagram, TUVW is a trapezium with $TW \parallel UV \parallel RX$; $RS \parallel XV$ and $RT \perp US$. $UT = TW = SV$ and RSTU is a square.

- Prove that STWV is a rhombus. (C)
- Hence, prove that RSVX is a rhombus. (R)
- Show that $RU = RX = XV$ (R)

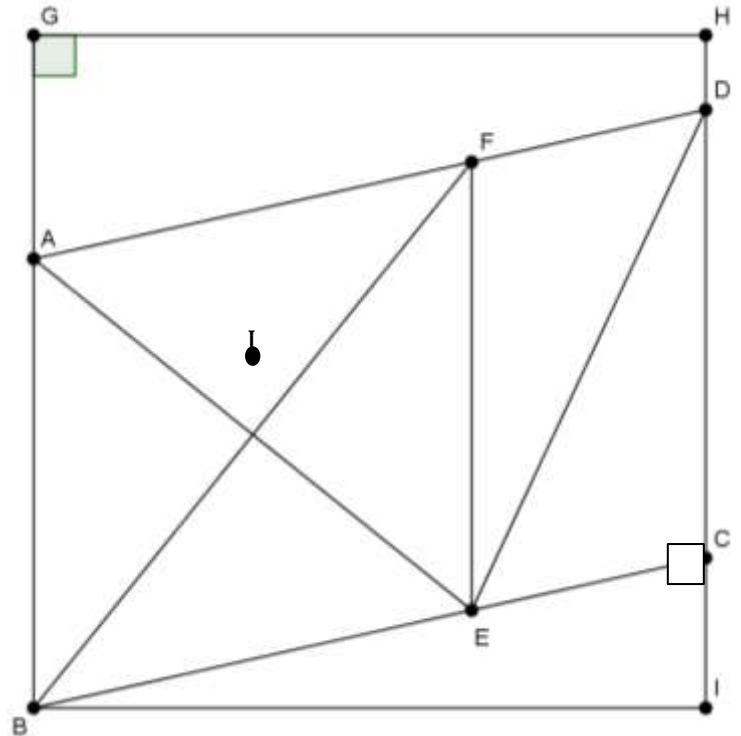


3. Look at the shape given below. $AD \parallel GH \parallel BC$ and $AB \parallel FE \parallel DH$ and $GF \parallel BI$ and $FH \parallel IC$.
Name:



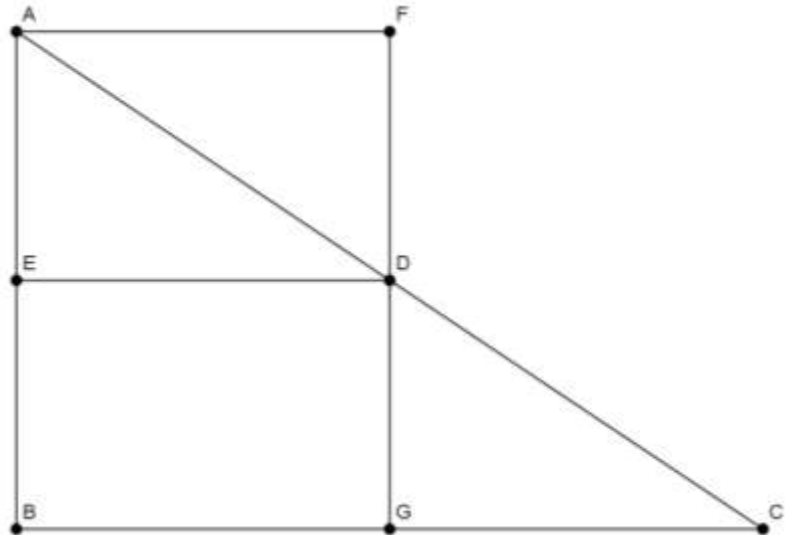
- all the rectangles
 - all the trapeziums
 - all the kites
 - all the squares
 - all the parallelograms
 - all isosceles triangles
4. Given below is quadrilateral BGHI, with ABCD a parallelogram inside BGHI. $FE \parallel AB$

- Prove that $\triangle DEF$ is congruent with $\triangle CDE$. (R)
- Hence, prove that CDFE is a parallelogram. (R)
- Prove that $\triangle ABE$ is congruent with $\triangle AFE$. (C)
- Prove that ABEF is a rhombus, given that $\hat{ABJ} = \hat{AFJ}$. (C)
- Prove that $GH \parallel BI$. (P)



5. Given below is a right-angled triangle, $\triangle ABC$, with $ED \parallel BC \parallel AF$. E is the midpoint of line AB and $AB \parallel FG$.

- Prove that $\triangle ABC$ is similar to $\triangle AED$. (R)
- Prove that $\triangle AED$ is congruent with $\triangle CDG$. (C)
- Prove that $\triangle ABC$ is similar to $\triangle CDG$. (C)
- Hence prove that BEDG is a rectangle. (C)
- Show that ABGD is a trapezium. (R)



6. Given on the right is the diagram of rhombus JKLM.

$KO \perp LM$, $KP \perp JM$, $MN \perp KJ$, $MQ \perp LK$ and $KO \perp KJ$.

- Show that $\triangle KLO$ and $\triangle MLQ$ are congruent. (R)
- Prove that LOSQ is a kite. (C)
- Prove that $\triangle KQS$ and $\triangle MOS$ are congruent. (R)
- Prove that KSMT is a rhombus (C)
- Hence, prove that KNMO is a rectangle. (C)
- Prove that KPMQ is a rectangle. (C)
- Are KNMO and KPMQ identical rectangles? Show all working out and reasons. (P)

