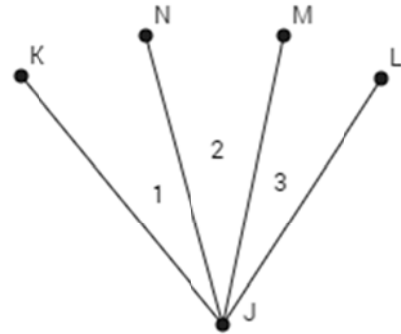


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2.5-6 Proofs about Segments, Angles and Geometric Relationships

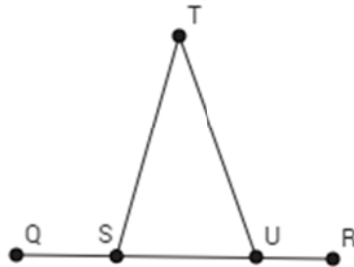
1) Prove  $AB = BC$  given  $AC = AB + BC$ .

2) Prove  $m\angle NJL = m\angle KJM$  given  $m\angle 1 = m\angle 3$ .



3) Prove  $AB = 2AM$  given  $M$  is the midpoint of segment  $AB$ .

4) Given  $m\angle TSU = m\angle TUS$ , prove  $\angle QST$  and  $\angle TUS$  are supplementary.



5) Given  $CF = EB$  and segment  $EF$  bisects  $AB$  and  $CD$ , prove  $BC = DF$ .

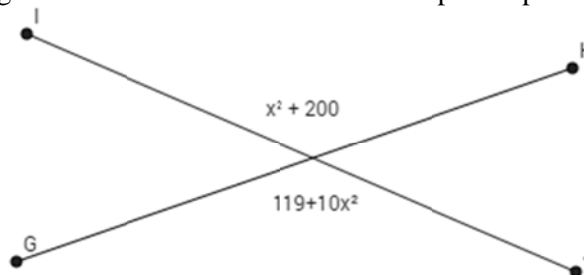


6) Prove the Congruent Complements Theorem (you do not have to prove the congruent supplements theorem since it is essentially the same proof, but just know it is also true). Given  $\angle 1$  and  $\angle 2$  are complementary and  $\angle 2$  and  $\angle 3$  are complementary, then prove  $\angle 1 = \angle 3$ .

7) Prove the vertical angles theorem. Given two intersecting lines create four angles  $\angle 1$ ,  $\angle 2$ ,  $\angle 3$  and  $\angle 4$  and  $\angle 1$  and  $\angle 3$  are vertical, prove they are congruent using the linear pair postulate.

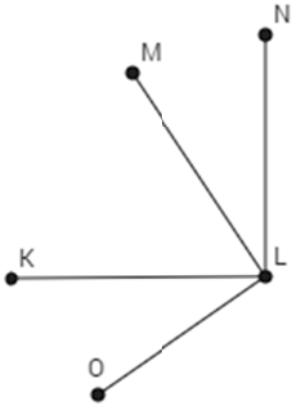
8) Why is the rule for vertical angles a theorem and the rule for linear pairs a postulate?

9) Prove  $x = 3$ .

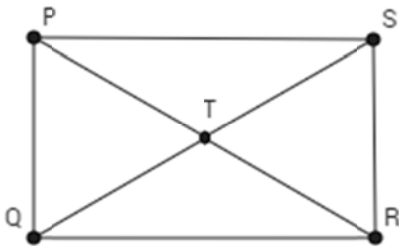


10) How do you disprove something?

11) Given  $\angle KLN$  and  $\angle MLO$  are right, prove  $m\angle KLO = m\angle MLN$ .



12) Given  $PT = QT$  and  $TS = TR$ , prove  $PR = QS$ . Bonus: Is this enough to show triangles  $PQT$  and  $RST$  are congruent?



13) Prove that the four lines would create a rectangle.

$$y_1 = 10 - 3x$$

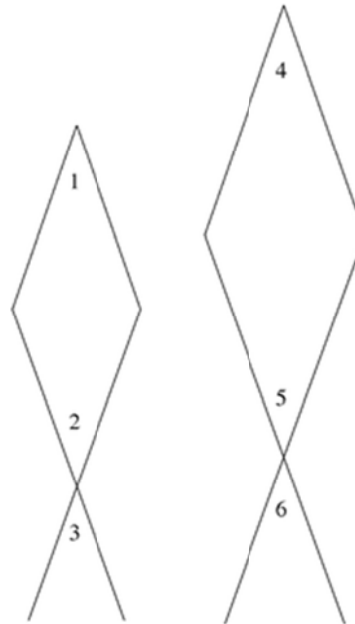
$$y_2 = -(3x + 2)$$

$$y_3 = (1/3)(x + 4)$$

$$y_4 = (-3)(7 - (1/9)x)$$

(Hint: A rectangle is a quadrilateral where opposite sides are perpendicular)

14) Given  $m\angle 1 = m\angle 3$ ,  $m\angle 4 = m\angle 6$ ,  $m\angle 1 = m\angle 4$ , prove  $m\angle 2 = m\angle 5$ .



15) Challenge: Let  $ABCD$  be a quadrilateral. Let  $EFGH$  be the quadrilateral formed by connecting the midpoints of sides  $ABCD$ . Prove  $EFGH$  is a parallelogram.