Section 8.1

Exercise 12.a: Vieta solved the quadratic equation $x^2+ax = b$ by substituting $x = y-a/2$. This produces a quadratic in y in which the first degree term is missing. Use this method to solve,

$$x^2 + 8x = 9.$$

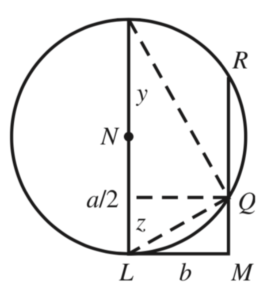
Solution:
Note that using Vieta's method we must first let $x = y - 4$. Substituting into the equation we get,

$$\begin{aligned}(y-4)^2 + 8(y-4) &= 9,\\ y^2 - 8y + 16 + 8y - 32 &= 9,\\ y^2 - 16 &= 9,\\ y^2 &= 25,\\ y &= \pm 5.\end{aligned}$$

With $y = \pm 5$ solving for x, we get $x = 1, -9$.

Section 8.2

Exercise 2: In la geometrie, Descares construced the positvie solutions to the quadratic equaiton $x^2 = ax - b^2$ where $b < a/2$. Given a circle of eadius $NL = a/2$, draw a tangent to L and lay off from the point of contact a length $LM = b$. Then, through M, draw a line parallel to NL.



Cutting the circle in the points Q and R. Prove that that the lengths MQ and MR represent the two positive solutions to $x^2 = ax - b^2$

Solution:
Like the hint suggests lets suppose that $y = KJ$ and $z = JL$ such that $y + z = a$. By

carpenter's lemma and AA similarity we know that $\triangle QJL \sim \triangle QJQ \sim \triangle KQL$. By similarity we know that,

$$\frac{b}{z} = \frac{y}{b},$$
$$b^2 = yz$$

Perspective Problems

Exercise 1: **Solution:**

Exercise 2: **Solution:**

Projective Problems

Exercise 1: **Solution:**

Reflection

1.

2.