We will follow Robson and use this (anachronistic) notation for Mesopotamian sexigesimals: a semicolon for the radix point, spaces separating the place values, and values from 00 to 59 in each position. So we write 01 11 to mean $1 \cdot 60 + 11 \cdot 1 = 71$ and 05; 12 to mean $5 \cdot 1 + 12 \cdot \frac{1}{60} = \frac{26}{5}$. To read a bit more, here are some links:

- `https://en.wikipedia.org/wiki/Sexagesimal#Babylonian_mathematics`
- `https://en.wikipedia.org/wiki/Plimpton_322`

(A1) Convert the following: 211_3 to base 9; $5E7_{16}$ to base 10; 94_{10} to base 2.

(A2) One of the interpretations of Plimpton 322 is that the columns list values of $(c/a)^2$, b, and c in Pythagorean triples. Verify that if $(c/a)^2$ is 01; 33 45 and $b = 45$ and $c = 01\ 15$, then (a, b, c) form a Pythagorean triple. (This is row 11 of the tablet.)

(A3) Verify any three of the reciprocal pairs in MLC 1670 (Figure 9 in Robson).

(A4) For each of the following numbers, give the first three places of its sexigesimal expansion. $\frac{101}{5}$, $\frac{71}{8}$, $\frac{60}{14}$, $\sqrt{101}$.

(B1) Give an exact condition for when a rational number p/q has a terminating decimal expression. Which ones have a terminating expression in base n? Prove it.

(B2) Show that if (a, b, c) is any Pythagorean triple, then

$$\frac{a}{c} = \frac{p^2 - q^2}{p^2 + q^2}, \qquad \frac{b}{c} = \frac{2pq}{p^2 + q^2},$$

for some integers p, q. (Try this first. I'll add a hint later.)

Explain how this can be used to derive the Neugebauer-Aaboe interpretation of Plimpton 322 that Robson describes on p107-108.

(B3) Show that if $(a, b, c,)$ is a Pythagorean triple, then a and b can't both be odd.