6. [10 pts] Explain how remainders help us to know that fractions can only create decimals that terminate or repeat.

When you convert a fraction to a decimal, you divide by the denominator, and one of two things must happen:

Either you get a remainder of 0, which terminates the calculation — and decimal

or else the calculation never stops, in which case the limited number of remainders must recycle + so then does the calculation — and decimal.

7. [6 pts] Which is larger: \( \frac{4}{3} \) of a number, or 130% of the number? Justify your response verbally or with a computation.

\( \frac{4}{3} \) is larger: \( \frac{4}{3} \) of \$100 is \$133.33 while 130% of \$100 is only \$130.

OR \( \frac{4}{3} \cdot x = 1.333... \cdot x \) and 130% of \( x = 1.3 \cdot x \)

\[ \frac{4}{3} > 1.3 \]

8. [8 pts] Use the definition of exponents (not any rules) to show why \((a^4)^2\) equals what it does.

\[
(a^4)^2 = a^4 \cdot a^4
\]

\[
= (a \cdot a \cdot a \cdot a) \cdot (a \cdot a \cdot a \cdot a)
\]

\[
= a^8
\]