1.10 Classwork: Precision and percent error

Write formula for percent error in your notebook

$$\epsilon = \left| \frac{v_A - v_E}{v_E} \right| \times 100\%$$

1. Round each value to the *nearest thousandth*.

   (a) $e = 2.7182818...$ (Euler's number)

   (b) π

   (c) $\phi = 1.618033989...$ (the golden ratio)

   (d) $\sqrt{3}$

2. Round each value to the nearest hundred thousand.

   (a) 1,694,251 (population of the Manhattan)

   (b) 2,405,464 (population of Queens)

3. Find the percent error for each approximation.

   (a) $\pi \approx \dfrac{355}{113}$ (Zu's ratio)

   (b) 365 days $\approx$ 52 weeks

   (c) $2^{10} = 1000$ (kilobyte)

   (d) 1 gallon $\approx$ 4 liters (use conversion table's value)

4. Convert each measure. Show the multiplication by the appropriate conversion factor (fraction), including units.

   Example: Approximate the number of weeks in $T = 2$ years.

$$T = 2\,\text{years} \times \frac{52\,\text{weeks}}{1\,\text{year}} = 104\,\text{weeks}$$

   (a) Find the length in yards of a quarter-mile track.

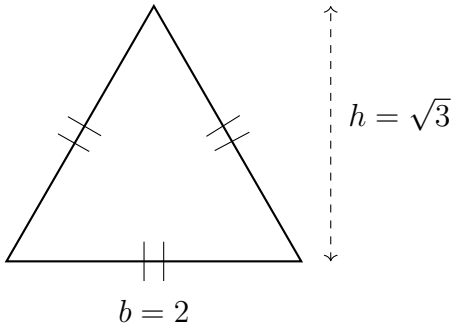
   (b) Find the number of liters in a 15 gallon gas tank.

5. Find the number of hours in 4 weeks. (multiply by two conversion factors, weeks to days, then days to hours)

6. Find the area of the equilateral triangle two ways and quantify the error.

   (a) Use the exact height of the triangle, $h = \sqrt{3}$.

   (b) Assume the height is the same as the base, $h = 2$.



   (c) Calculate the percent error.