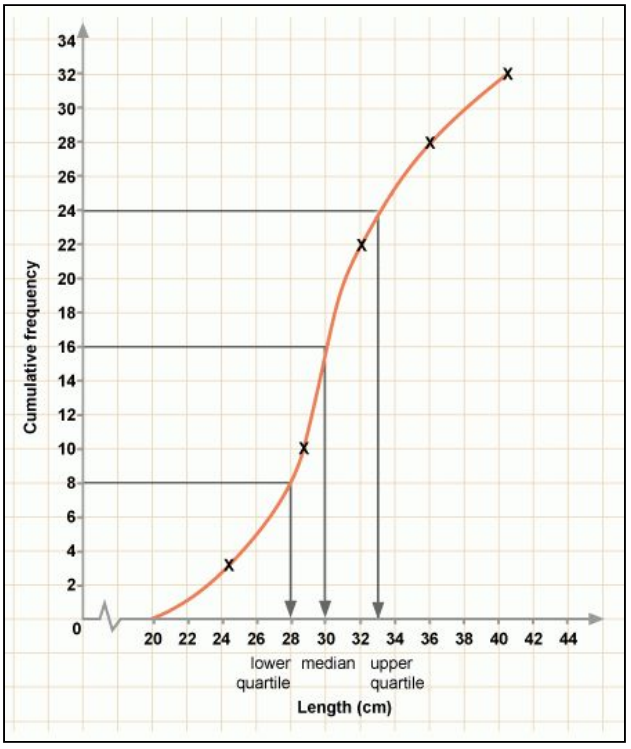
1. **(T4.2, E, CA)** The following cumulative frequency graph (also known as ogives) shows the accumulated frequency of lengths of tails of cheetah cubs. *(Oxford 8.5, p271)*

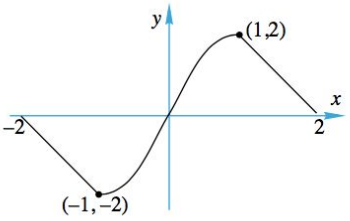


   a. Create a box and whisker plot from the CFG
   b. Create an appropriate frequency table from the CFG (HINT: think about a plausible interval width for your table)
   c. Hence, estimate the mean tail lengths.
   d. Draw a frequency histogram and a frequency polygon.

2. **(T1.3, R, CA)** For the following geometric sequences, determine (i) the common ratio, (ii) the 8th term and (iii) the sum of the first 8 terms: *(Cirrito, 8.2, p.252)*

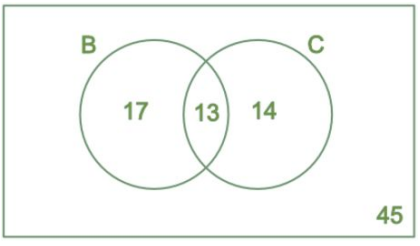
   a. 16, 8, 4, ... b. -4, 12, -36, 108, ... c. 25, 10, 4, ...

3. **(T2.11, R, CI)** The graph of $y = f(x)$ is given. Use this graph to sketch the new graphs of the following. Label the intercepts and extrema (maximums and minimums) in the new graphs: *(Cirrito 6.1, p.167; Cirrito 6.2, p.177; Cirrito 6.3, p.183)*



   a. $y = 1 + f(-x)$
   b. $y = 2 - f(\frac{1}{2}x)$
   c. $y = f(1 - x)$

4. **(T4.6, R, CA)** The Venn diagram shows students that are studying a Science subject. The Venn diagram shows those studying Biology (B) and Chemistry (C). *(Cirrito 15.2, p.508)*



   a. Find the values of *P*(*B*) and the value of *P*(*C*).
   b. What is the probability of a student studying Biology if they are also studying Chemistry?
   c. What is the *P*(*B*) x *P*(*C*)?
   d. What is *P*(*B* and *C*) according to the information presented in the Venn Diagram?
   e. Explain why your answers to Q(c) and Q(d) are different.

5. **(T2.9, R, CA)** The population of a certain bacteria grows exponentially and can be modeled by $P(t) = 18(2)^{t/3.5}$ where *t* is time in hours. *(Cirrito 7.2, p.209)*
   a. What was the population of the bacteria when the observations started?
   b. What is the doubling period of this bacteria?
   c. What is the hourly growth rate of this population?
   d. How many bacteria will be present in 35 hours?
   e. When will the bacteria reach a population of 294,900?
   f. Let's now make the assumption that the bacteria population was changing continuously. Knowing the doubling period from Q(c), show that the equation can also be written using the natural base (*e*) as $P(t) = 18e^{0.198042\,t}$.

6. **(T3.2, T3.4, E, CA)** A triangle has adjacent sides measuring 12 cm and 10 cm and the angle between the sides is 2 radians. *(Cirrito 9.5.4, p.300)*
   a. Draw a diagram, showing this triangle.
   b. How many degrees is 2 radians?
   c. Determine the measure of the third side of the triangle. Does it matter whether you used the angle measure of radians or degrees to answer this question?)

7. **(T4.2, R, CI)** Here is a frequency distribution table, showing the number of hours a typical SL Math student spends per night on Math homework. Use the data in this table to:
   (Cirrito 13.2, p.471)

x	0	1	2	3	4	5
Frequency	1	3	6	6	7	1

   a. Construct a frequency histogram and hence a frequency polygon.
   b. Construct a cumulative frequency graph.
   c. Calculate the 3 measures of central tendency.
   d. Construct a box and whisker plot

8. **(T3.5, R, CI)** Let $\sin\theta = \frac{\sqrt{5}}{3}$, where θ is *obtuse*. *(Cirrito 10.1.2, p.316)*
   a. Which quadrant is θ in?
   b. Find $\cos\theta$ and $\tan\theta$.
   c. Show that $\tan\theta = \sin\theta/\cos\theta$.
   d. Find the value of $\sin^2\theta + \cos^2\theta$.