1. **(T1.1, N, CA)** On September 1st, my cat eats three "Lucky Lynx" treats. On the next day, she eats seven, and on each day throughout September the number of treats she eats increases by the same amount. *(Cirrito, 8.1.2, p.245)*

   a.   How many snacks did my cat eat on the tenth day?
   b.   On what day does she eat the 1121st treat?

2. **(T2.7, R, CI)** By considering the discriminant, or otherwise, find the value(s) of k for which the following equation $x^2 - 10x + k = 0$ has two distinct real roots. *(Cirrito 2.4.1, p.39)*

3. **(T1.2, R, CI)** Use your knowledge of exponent laws to simplify the following expressions: *(Cirrito 7.1.1, p197)*

   a. $\left(\frac{3y^2}{4x^3}\right)^3 \times \left(2x^2y^3\right)^3$ b. $\frac{9^n \times 3^{n+2}}{27^n}$ c. $\frac{4^{n+2}-16}{4}$

4. **(T1.2, T2.6, E, CA)** A frozen turkey whose core temperature is 70 degrees is placed in an oven that has been preheated to 325 degrees. After one hour, the core temperature has risen to 100 degrees. The turkey will be ready to serve when its core temperature reaches 190 degrees. To the nearest minute, how much more time will this take, if the relationship between time and temperature was (i) linear, (ii) exponential? *(Cirrito 7.2, p209)*

5. **(T3.6, N, CA)** A javelin lands with two meters of its length sticking out of the ground, making a 52-degree angle with the ground. The sun is directly overhead. The javelin's shadow on the ground is an example of a perpendicular projection. Find its length, to the nearest cm. *(Cirrito 9.1.1, p273)*

6. **(T3.4, T3.5, R, CA)** Jamie rides a Ferris wheel for five minutes and let's assume that he gets on the Ferris wheel when the wheel is at its lowest point - at the bottom!!! The diameter of the wheel is 10 meters, and its center is 6 meters above the ground. Each revolution of the wheel takes 30 seconds. Being more than 9 meters above the ground enables Jamie to see the ocean. For how many seconds does Jamie see the ocean? *(Cirrito 10.5, p361)*

7. **(T3.1, T3.6, R, CA)** The diagram shows quadrilateral ABCD, with AB = 7 cm, BC = 9 cm, CD = 8 cm and AD 15 cm. Angle ACD = 82°, angle CAD = $x°$ and angle ABC = $y°$. *(Cirrito 9.5.1, p290; Cirrito 9.5.4, p300)*
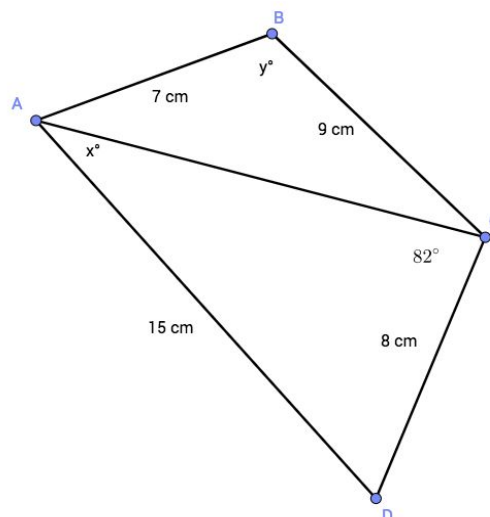
a. Find the value of x. Express your answer in both degrees and radians.

b. Find the length of AC.

c. Find the value of y. Express your answer in both degrees and radians.

d. Find the area of the quadrilateral.

8. **(T5.5, R, CI)** Max travels to school each day by bicycle, by bus or by car. The probability that he travels by bus on any day is 0.6 and the probability that he travels by bicycle on any day is 0.3. *(Oxford 3.5, p89)*

a. Draw a tree diagram which shows the possible outcomes for Max's journeys on Monday and Tuesday. Label the tree diagram, writing the probabilities of each outcome.

b. What is the probability that he travels
   i.   By bicycle on Monday and Tuesday?
   ii.   By bicycle on Monday and bus on Tuesday?
   iii. By the same method on Monday and Tuesday?

c. Max traveled to school by bicycle on Monday and Tuesday. What is the probability that he does not travel to school by bicycle on Wednesday, Thursday and Friday?

d. What is the probability that in any three days Max travels twice by car and once by bus or twice by bicycle and once by car?