Ex1
There are 8 sweets in a jar. n of the sweets are green. Katie takes one sweet at random from the jar and does not replace it.
She takes a second sweet at random from the jar. The probability that she takes 2 green sweets is $^5/_{14}$.

[a] Show that $n^2 - n - 20 = 0$.

[b] How many green sweets are there in the jar?

Q1
Tony kicks a football in the air. The formula $h = 9 + 20t - 4t^2$ gives the height, in feet, of the ball above the ground t seconds after Tony kicks it. How many seconds is the ball in the air for? Give your answer correct to two significant figures.

Q3
Elizabeth is x years old.
Ruby is 6 years older than Elizabeth.
The product of their ages is 40.

[a] Show that $x^2 + 6x - 40 = 0$.

[b] How old are Elizabeth and Ruby?

Q5
Jimmy is x years old.
Sarah is 11 years older than Jimmy.
The product of their ages is 80.

[a] Show that $x^2 + 11x - 80 = 0$.

[b] How old are Jimmy and Sarah?

Q7
Callum buys a pair of trainers for £$25x$.
He later sells the trainers for £$(200 + 2x)$.
He makes a profit of x%.
Calculate the percentage profit x%.

Q9
A coin is biased so that the probability that it shows tails on any throw is p.
The coin is thrown twice. The probability that the coin shows tails exactly once is $^4/_9$.
Show that $9p^2 - 9p = 2$

Ex2
Clark is a javelin thrower. The formula $h = 10 + 20t - 7t^2$ gives the height, in metres, of the shot above the ground t seconds after Clark releases the throw. How many seconds does it take for the javelin to hit the ground? Give your answer correct to two significant figures.

Q2
There are 10 marbles in a bag. n of the marbles are blue. Jim takes one marble at random from the bag and does not replace it.
He takes a second marble at random from the bag. The probability that he takes 2 blue marbles is $^1/_{15}$.

[a] Show that $n^2 - n - 6 = 0$.

[b] How many blue marbles are there in the bag?

Q4
Harriet is x years old.
Martha is 5 years younger than Harriet.
The product of their ages is 84.

[a] Show that $x^2 - 5x - 84 = 0$.

[b] How old are Harriet and Martha?

Q6
Kerry is x years old.
Craig is 9 years younger than Kerry.
The product of their ages is 136.

[a] Show that $x^2 - 9x - 136 = 0$.

[b] How old are Kerry and Craig?

Q8
$20x$ red squirrels are delivered to a forest as part of a re-introduction program.
The population increases $220 + 8x$ in the first year. Calculate the percentage increase of the population.

Q10
The length of a rectangle is the same as the length of each side of a square. The length of the rectangle is 5cm more than twice the width of the rectangle. The area of the square is 63cm^2 greater than the area of the rectangle. Find the length of the square.