

Valentine's Day maths activities for IGCSE and GCSE

IGCSE Math Revision · IGCSE and GCSE (Higher and Extended) · 14 February · Student sheet

Name _____

Class _____

Date _____

The starter is non-calculator. A calculator is allowed in the main activity.

Starter (5 minutes)

1. Find the area of a circle of radius 5 cm, in terms of π .
2. Find the circumference of a circle of diameter 8 cm, in terms of π .
3. A bag has 3 red and 5 white heart sweets. One is taken at random. Find $P(\text{red})$.
4. Share 48 sweets in the ratio 3 : 5.

Main activity (35 minutes)

Task A: Design a heart

A heart is made from a square of side 6 cm, turned to stand on a corner, with a semicircle on each of its two upper sides.

- a. Find the area of the heart, exactly and to 3 significant figures.
- b. Find the perimeter of the heart, to 3 significant figures.
- c. A bigger heart for a card is an enlargement with side 9 cm. Find its area, to 3 significant figures, using the area scale factor.

Task B: Secret card swap

Friends each write their name on a card. The cards are shuffled and each friend takes one at random.

- a. There are 3 friends, A, B and C. List all the ways the cards can be handed out. Find the probability that nobody gets their own card.
- b. With 3 friends, find the probability that everybody gets their own card.
- c. With 4 friends there are 24 ways, and in 9 of them nobody gets their own card. Find this probability in its simplest form, and say whether it is more or less likely than with 3 friends.

Task C: Sweet hearts

A bag holds 10 sweets: 4 red hearts and 6 pink hearts. Two sweets are taken without replacement.

- a. Draw a tree diagram. Find the probability that both sweets are red.
- b. Find the probability of one red and one pink.
- c. Find the probability of at least one red.

Extension

1. Three people each pick a whole number from 1 to 6 at random. Find the probability that at least two of them pick the same number.
2. A heart of the shape in task A must have an area of 100 cm^2 . Find the side of the square, to 3 significant figures.