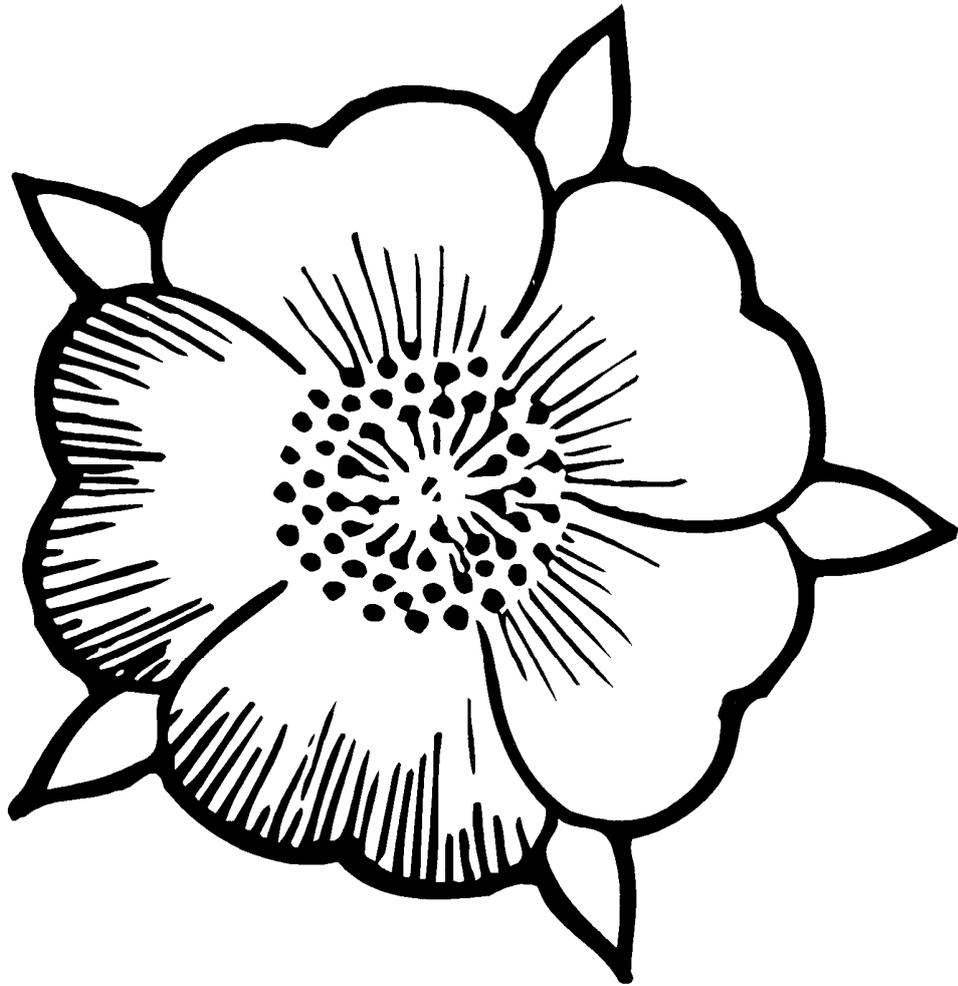




Birmingham Botanical Gardens



**Key Stage 3
Maths Trail
Answers for Teachers**

Introduction

Useful information about the trail has been set out in the format:

- answer (when possible)
- comments (when appropriate)

Answers

These are not always hard and fast. Prices change, temperatures change and some questions depend on debate. But best of all, you and your pupils may have your own ideas about how to tackle a particular question. Jolly good too: you know them better than we do.

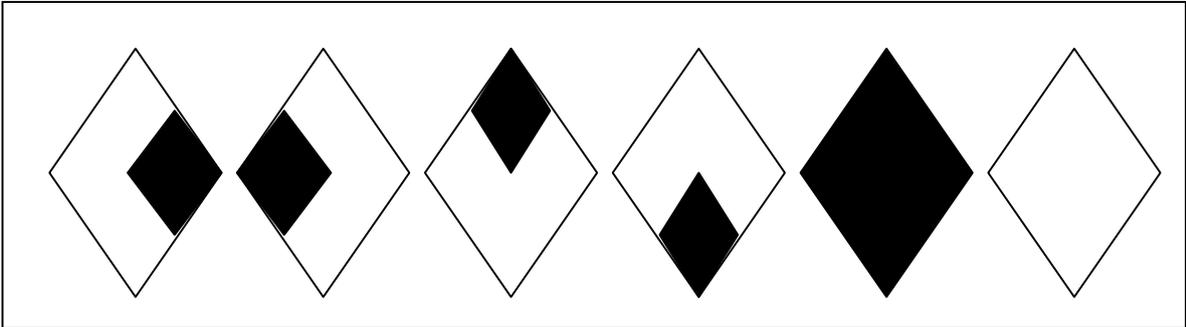
If you don't already have a Math's trail around your own school grounds or locality, then we hope that this trail gives you some ideas.

Meanwhile, enjoy the Botanical Gardens' trail and may the sun shine on you!

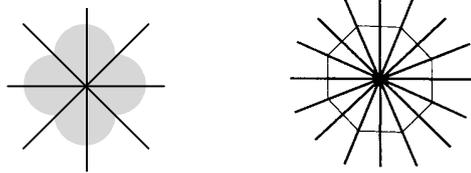
Written in connection with Birmingham City Council's Education Department

Q	Answer	Comments
1	Day tickets	In 2013 a Family weekday ticket costs £22, 1 adult + 3 child's day tickets cost cheaper at £7 + (3 x £4.75), i.e. £21.25
2	Saturday	Seven times table and days in the months: essential knowledge
3	Depends	Temperature and humidity will vary. Note that the vegetation in the Subtropical House grows normally in temperatures that range from 10 to 27°C
4	South East	
5	Around 61	Judged by eye, as semi-circle of outer bricks appeared to contain 30 ½. Hence 30 ½ x 2
6	276	6 layers of bricks, 46 bricks in the top layer, hence 46 x 6
7	14	This is how it works:

$$9 + 1 + 1 + 1 + 1 + 1 = 14$$



8 See right These are two possibilities



9 90°

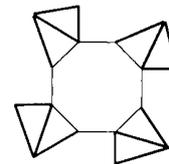
10 Including rectangles and triangles. The students could try to identify the types of triangles to extend this question

11 Including squares, rectangles and triangles. Note symmetry in the patterns

12 26 This is really best done back in the classroom, on multiple copies of the court markings. A popular answer is 10, but this doesn't allow for all the possible rectangle combinations

13 Depends The answer will be the current year you are in minus 1982)

14 For example
Any net will work that combines an octagon with 8 isosceles triangles as long as each triangle's base will fold onto, or is attached to, only one octagon edge



15 $C=500\text{cm}$
 $D=154\text{cm}$
Both approximate hence:
 $C - D=3.25$
The main purpose is to get a rough value for pi: maybe then see if the same thing happens with other circles. Hence, you might be satisfied with: $C=\text{nearly } 17 \text{ A4 sheet lengths}$
 $D=5 \text{ and a bit A4 sheet lengths,}$
which gives a 'pi' of about 3.3.