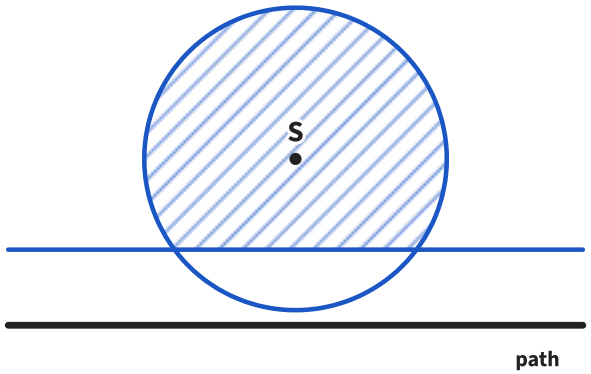
# Loci: combining rules and regions

ANSWERS

**1** **Scale: 1 cm represents 20 m**

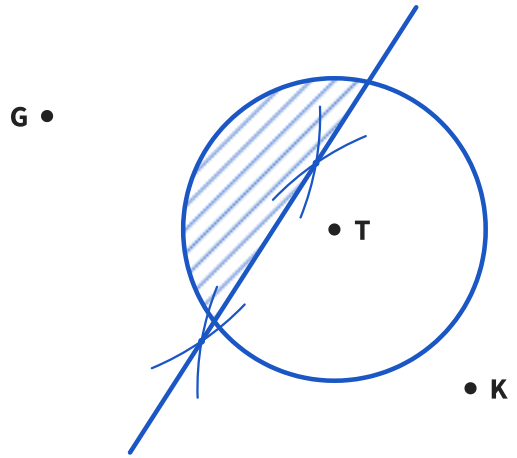
A sprinkler S waters everything up to 40 m from it. Shade the part it waters that is more than 20 m from the path.




| Rule | On the plan | Shade |
|---|---|---|
| up to 40 m from S | circle, radius 2 cm | inside |
| more than 20 m from the path | line 1 cm from the path | away from the path |

**2** **Scale: 1 cm represents 50 m**

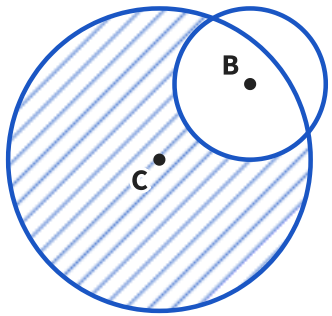
A tent must be less than 100 m from the tap T and closer to the gate G than to the gate K. Shade where it can go.




| Rule | On the plan | Shade |
|---|---|---|
| less than 100 m from T | circle, radius 2 cm | inside |
| closer to G than to K | perpendicular bisector of GK | G's side |

**3** **Scale: 1 cm represents 15 m**

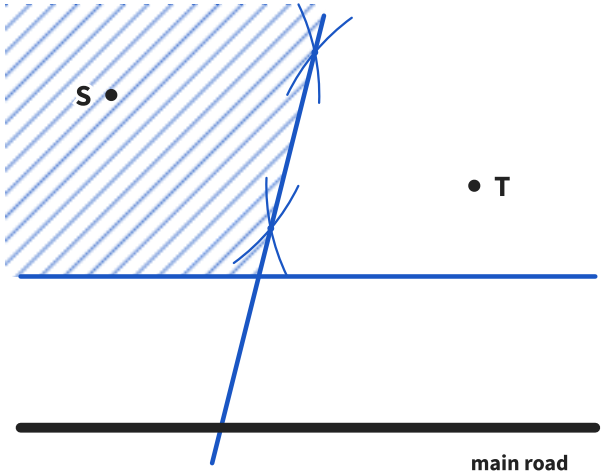
A picnic spot must be less than 30 m from the car park C and more than 15 m from the bins B. Shade where it can be.




| Rule | On the plan | Shade |
|---|---|---|
| less than 30 m from C | circle, radius 2 cm | inside |
| more than 15 m from B | circle, radius 1 cm | outside |

**4** **Scale: 1 cm represents 200 m**

A playground must be closer to the school S than to the station T and more than 400 m from the main road. Shade where it can go.




| Rule | On the plan | Shade |
|---|---|---|
| closer to S than to T | perpendicular bisector of ST | S's side |
| more than 400 m from the road | line 2 cm from the road | away from the road |

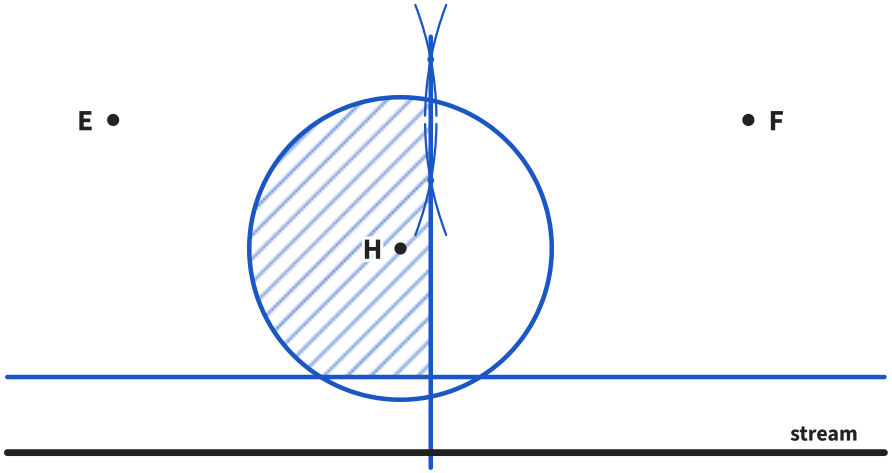
# Loci: combining rules and regions

ANSWERS

**5** *Notice the change!*

**Scale: 1 cm represents 20 m**

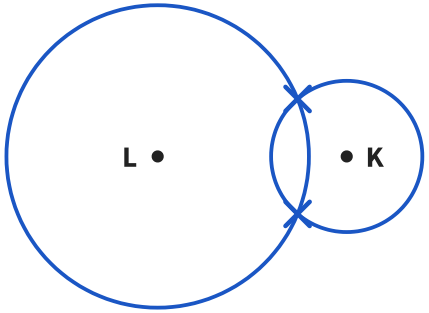
A marquee must be less than 40 m from the house H, more than 20 m from the stream and closer to the gate E than to the gate F. Shade where it can go.




**6**

**Scale: 1 cm represents 15 m**

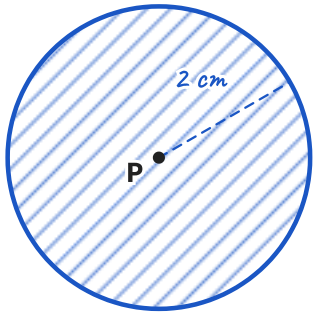
A charging point must be exactly 30 m from the lamp L and exactly 15 m from the kiosk K. Mark the places it could go. How many are there?




**Number of places =** 2

**7**

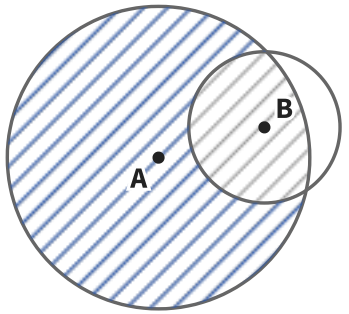
On a plan, 1 cm represents 50 m. Nia wants the points less than 100 m from P. She sets her compasses to 10 cm. Explain her mistake, then shade the region.




**Answer** She used the real distance as cm. 100 ÷ 50 = 2, so the radius is 2 cm.

**8**

Omar shades the points less than 2 cm from A and more than 1 cm from B. Is he right? Explain, then shade the right region.




Omar

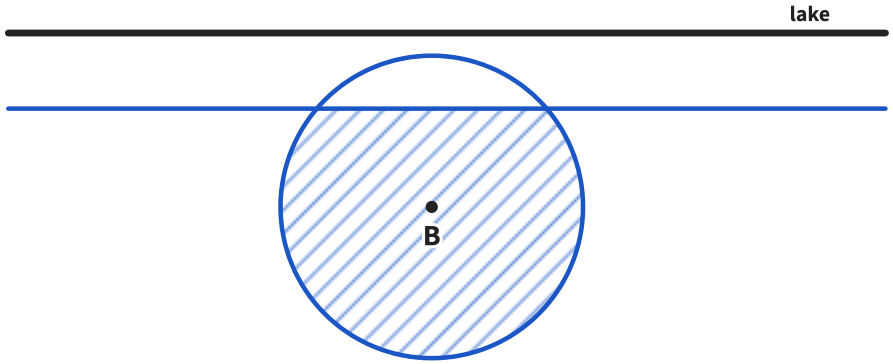
**Answer** No. He shaded where only the first rule is true. Leave out the part less than 1 cm from B.

# Loci: combining rules and regions *further practice*

ANSWERS

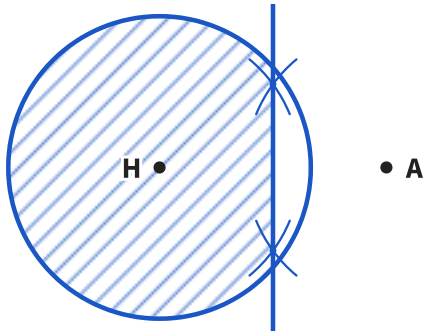
**9**

An ice cream van parks less than 60 m from the bandstand B and more than 30 m from the edge of the lake. Shade where it can park.
Scale: 1 cm represents 30 m



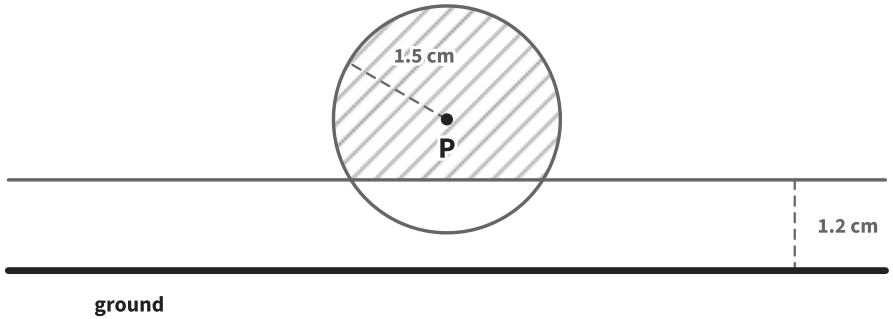

**10**

A rescue helicopter covers the points less than 10 km from the hospital H that are closer to H than to the airport A. Shade them.
Scale: 1 cm represents 5 km




**11**

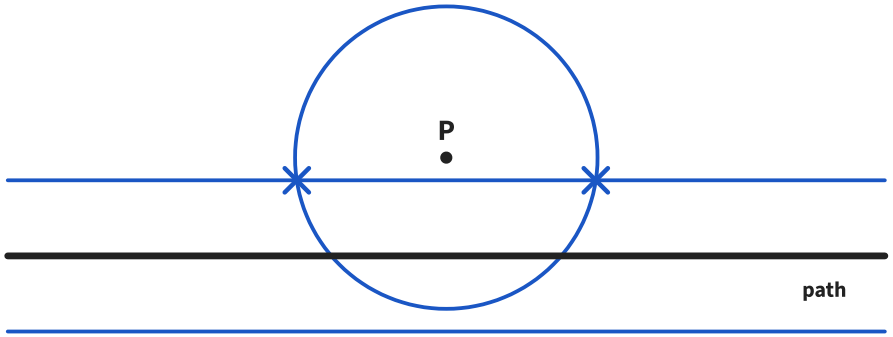
The shaded region shows where a kite can fly. Write the two rules that describe it, in metres.
Scale: 1 cm represents 10 m




**Answer** *Less than 15 m from P and more than 12 m from the ground.*

**12**

A litter bin must be exactly 10 m from the straight path and exactly 20 m from the gate P. How many places could it go?
Scale: 1 cm represents 10 m



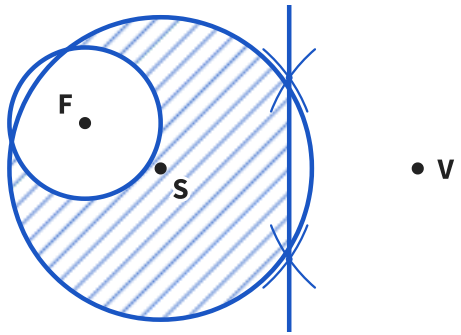

**Number of places =** *2*

# Loci: combining rules and regions *further practice*

ANSWERS

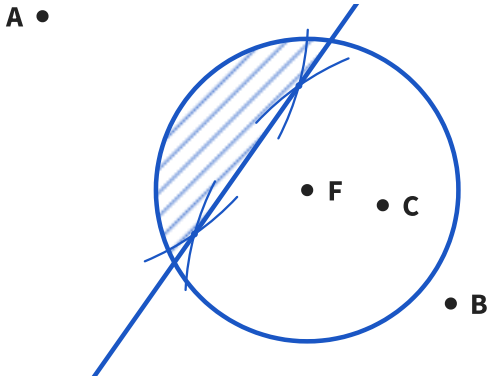
**13**

A wind turbine must be more than 1 km from the farmhouse F, less than 2 km from the substation S and closer to S than to the village V. Shade where it can go.
Scale: 1 cm represents 1 km




**14**

The region is less than 50 m from the fountain F and closer to the gate A than to the gate B. Is the café C in it? Draw the loci to decide.
Scale: 1 cm represents 25 m




**Answer** *No. C is less than 50 m from F, but it is closer to B than to A.*

**15**

P and Q are 4 cm apart. Is there a point that is less than 1.5 cm from P and less than 2 cm from Q? Explain.

**Answer** *No. 1.5 + 2 = 3.5, which is less than 4, so the two circles never meet.*

**16**

On a plan where 1 cm represents 10 m, the points less than 40 m from P are inside a circle of radius 4 cm. Kai redraws the plan with 1 cm to 20 m. What radius should he use? Explain.

**Answer** *2 cm. 40 ÷ 20 = 2. Each centimetre now stands for twice as far, so the radius halves.*