

MATHS



MODEL ANSWERS

ESTIMATING AREA IRREGULAR SHAPES

SCORE

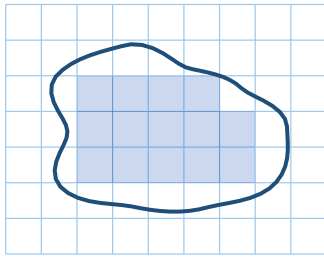
/185

PERCENTAGE

%

STEMUP

- 1 The diagram shows a flower bed drawn on a grid of squares.
Count the number of whole squares inside the outline.

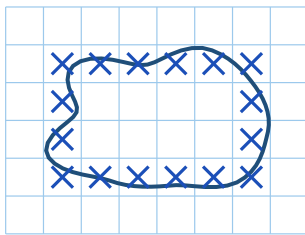


Count the squares that are completely inside the outline: 14

14

1 / 1

- 2 The diagram shows a lake drawn on a grid of squares.
Count the number of part squares: the squares that the outline goes through.

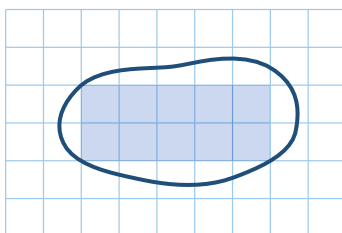


Count the squares that are only partly inside the outline: 16

16

1 / 1

- 3 The diagram shows an oil spill drawn on a grid of squares.
Shade every whole square inside the outline.
Write down how many squares you have shaded.

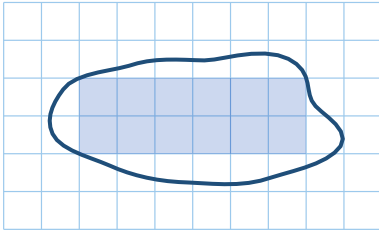


Shade the squares completely inside the outline:
there are 10

10

1 / 1

- 4 The diagram shows a footprint drawn on a grid of squares.
Count the number of whole squares inside the outline.

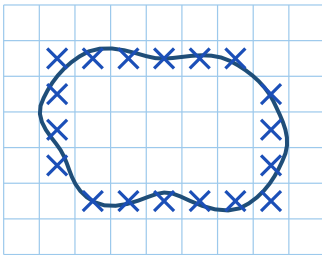


Count the squares that are completely inside the outline: 12

12

1 / 1

- 5 The diagram shows a footprint drawn on a grid of squares.
Count the number of part squares: the squares that the outline goes through.

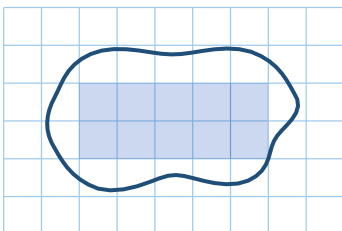


Count the squares that are only partly inside the outline: 18

18

1 / 1

- 6 The diagram shows a footprint drawn on a grid of squares.
Shade every whole square inside the outline.
Write down how many squares you have shaded.

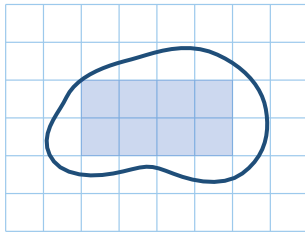


Shade the squares completely inside the outline: there are 10

10

1 / 1

- 7 The diagram shows a leaf drawn on a grid of squares.
Count the number of whole squares inside the outline.

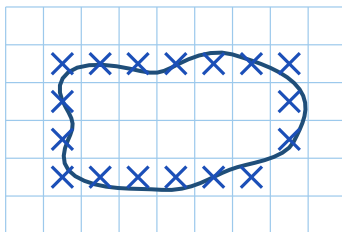


Count the squares that are completely inside the outline: 8

8

1 / 1

- 8 The diagram shows an island drawn on a grid of squares.
Count the number of part squares: the squares that the outline goes through.

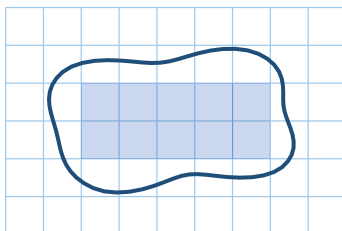


Count the squares that are only partly inside the outline: 17

17

1 / 1

- 9 The diagram shows a leaf drawn on a grid of squares.
Shade every whole square inside the outline.
Write down how many squares you have shaded.

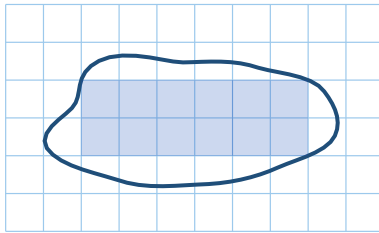


Shade the squares completely inside the outline: there are 10

10

1 / 1

- 10 The diagram shows an oil spill drawn on a grid of squares. Count the number of whole squares inside the outline.

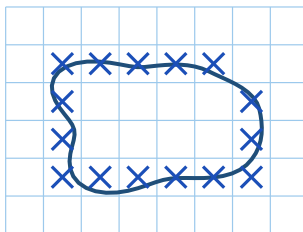


Count the squares that are completely inside the outline: 12

12

1 / 1

- 11 The diagram shows a flower bed drawn on a grid of squares. Count the number of part squares: the squares that the outline goes through.

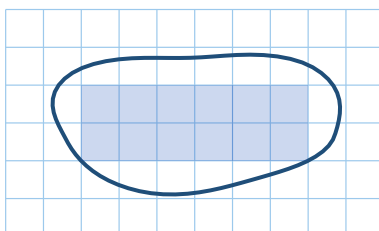


Count the squares that are only partly inside the outline: 15

15

1 / 1

- 12 The diagram shows a lake drawn on a grid of squares. Shade every whole square inside the outline. Write down how many squares you have shaded.

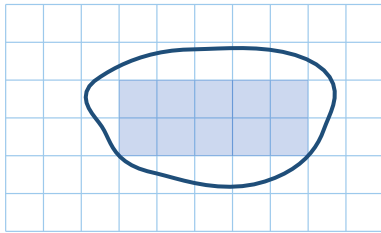


Shade the squares completely inside the outline: there are 12

12

1 / 1

- 13 The diagram shows a lake drawn on a grid of squares. Count the number of whole squares inside the outline.

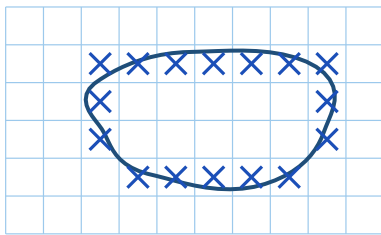


Count the squares that are completely inside the outline: 10

10

1 / 1

- 14 The diagram shows an oil spill drawn on a grid of squares. Count the number of part squares: the squares that the outline goes through.

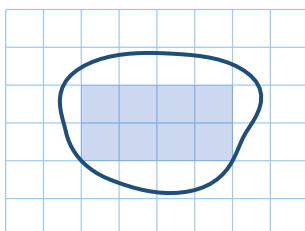


Count the squares that are only partly inside the outline: 16

16

1 / 1

- 15 The diagram shows a flower bed on a grid. The side of each square represents 2 m. Work out the area represented by one square.

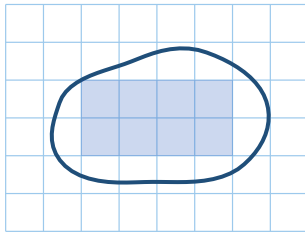


$$2 \times 2 = 4 \text{ m}^2$$

4 m²

1 / 1

- 16 The diagram shows a pond drawn on a grid of squares. Count the number of whole squares inside the outline.

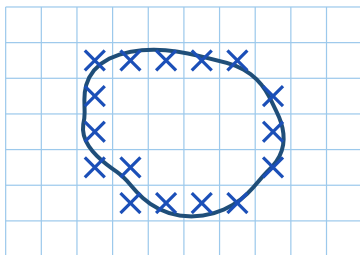


Count the squares that are completely inside the outline: 8

8

1 / 1

- 17 The diagram shows a pond drawn on a grid of squares. Count the number of part squares: the squares that the outline goes through.

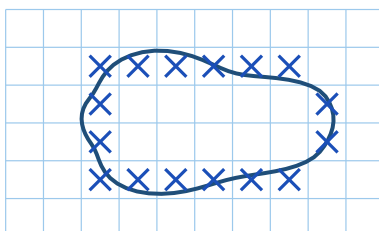


Count the squares that are only partly inside the outline: 16

16

1 / 1

- 18 The diagram shows a pond drawn on a grid of squares. Put a cross in every part square. Write down how many crosses you have drawn.

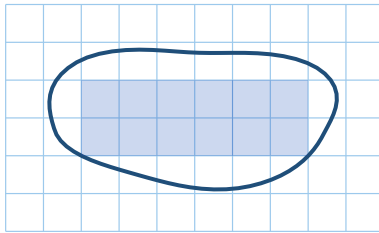


Put a cross in each square the outline passes through: there are 16

16

1 / 1

- 19 The diagram shows an island on a grid.
The side of each square represents 2 km.
Work out the area represented by one square.

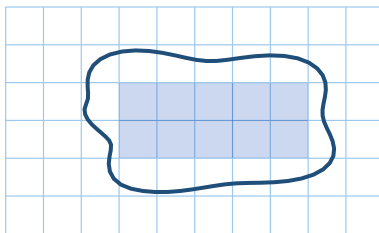


$$2 \times 2 = 4 \text{ km}^2$$

$$4 \text{ km}^2$$

1 / 1

- 20 The diagram shows a flower bed on a grid.
The side of each square represents 2 m.
Work out a lower estimate for the area of the flower bed.

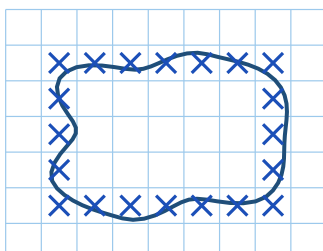


$$\begin{aligned} \text{area of one square} &= 2 \times 2 = 4 \text{ m}^2 \\ \text{whole squares} &= 10 \\ 10 \times 4 &= 40 \text{ m}^2 \end{aligned}$$

$$40 \text{ m}^2$$

1 / 1

- 21 The diagram shows an oil spill drawn on a grid of squares.
Put a cross in every part square.
Write down how many crosses you have drawn.

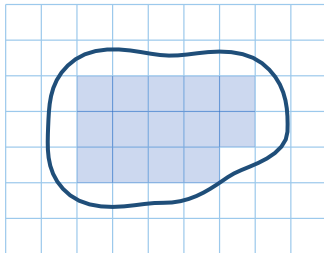


Put a cross in each square the outline passes through: there are 20

$$20$$

1 / 1

- 22 The diagram shows a footprint on a grid.
The side of each square represents 2 cm.
Work out the area represented by one square.

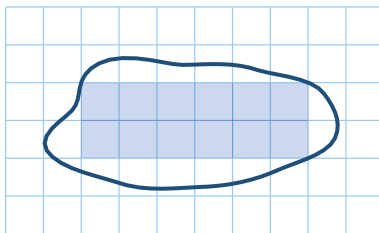


$$2 \times 2 = 4 \text{ cm}^2$$

$$4 \text{ cm}^2$$

1 / 1

- 23 The diagram shows a footprint on a grid.
Each square represents an area of 2 cm^2 .
Work out a lower estimate for the area of the footprint.



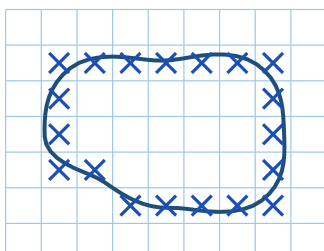
$$\text{whole squares} = 12$$

$$12 \times 2 = 24 \text{ cm}^2$$

$$24 \text{ cm}^2$$

1 / 1

- 24 The diagram shows a leaf drawn on a grid of squares.
Put a cross in every part square.
Write down how many crosses you have drawn.



Put a cross in each square the outline passes through: there are 19

$$19$$

1 / 1

- 25 An oil spill is drawn on a grid of squares.
 27 squares are completely inside the outline and 6 squares are partly inside the outline.
 The side of each square represents 3 m.
 Work out a lower estimate and an upper estimate for the area.

$$\text{area of one square} = 3 \times 3 = 9 \text{ m}^2$$

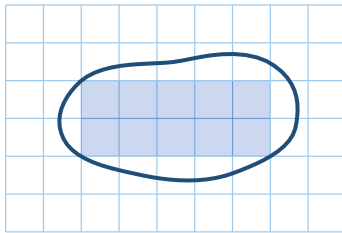
$$\text{lower: } 27 \times 9 = 243$$

$$\text{upper: } (27 + 6) \times 9 = 297$$

lower 243 m², upper 297 m²

1 / 1

- 26 The diagram shows an oil spill on a grid.
 Each square represents an area of 25 m².
 Work out a lower estimate for the area of the oil spill.



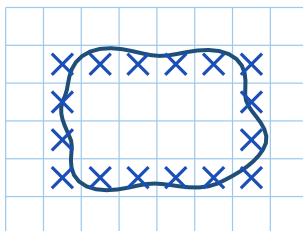
$$\text{whole squares} = 10$$

$$10 \times 25 = 250 \text{ m}^2$$

250 m²

1 / 1

- 27 The diagram shows a lake drawn on a grid of squares.
 Put a cross in every part square.
 Write down how many crosses you have drawn.

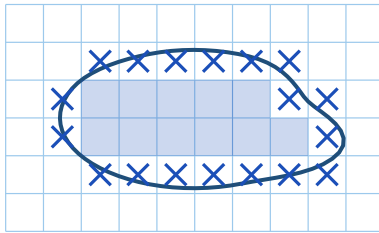


Put a cross in each square the outline passes through: there are 16

16

1 / 1

- 28 The diagram shows a lake on a grid.
Each square represents an area of 25 m^2 .
Work out an upper estimate for the area of the lake.

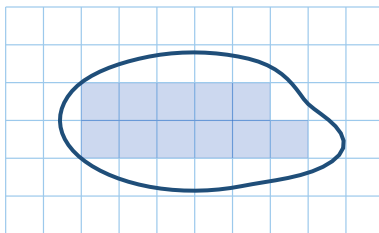


*whole squares 16 + part squares 13 = 29
squares
 $29 \times 25 = 725 \text{ m}^2$*

725 m²

1 / 1

- 29 The diagram shows a lake on a grid.
The side of each square represents 10 m.
Work out a lower estimate for the area of the lake.

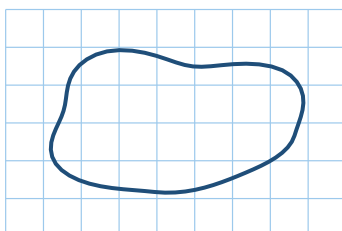


*area of one square = $10 \times 10 = 100 \text{ m}^2$
whole squares = 11
 $11 \times 100 = 1,100 \text{ m}^2$*

1,100 m²

1 / 1

- 30 The diagram shows a lake drawn on a grid of squares.
Is the area found by counting only the whole squares bigger or smaller than the true area? Give a reason.

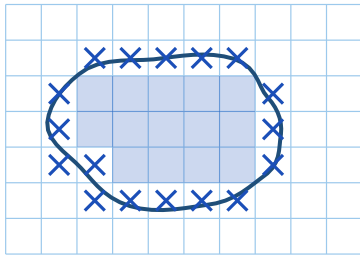


Smaller, because the part squares inside the outline have not been counted

Smaller

1 / 1

- 31 The diagram shows an island on a grid.
The side of each square represents 0.5 km.
Work out an upper estimate for the area of the island.

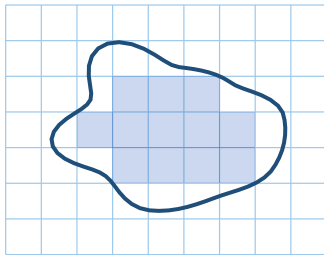


area of one square = $0.5 \times 0.5 = 0.25 \text{ km}^2$
whole squares 14 + part squares 17 = 31 squares
 $31 \times 0.25 = 7.75 \text{ km}^2$

7.75 km²

1 / 1

- 32 The diagram shows a pond on a grid.
Each square represents an area of 1 m².
Work out a lower estimate for the area of the pond.

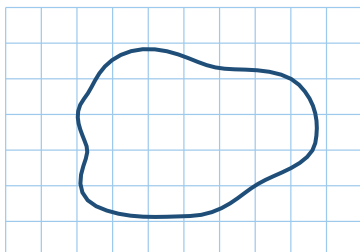


whole squares = 12
 $12 \times 1 = 12 \text{ m}^2$

12 m²

1 / 1

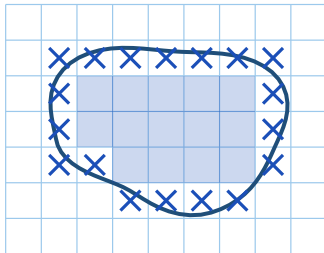
- 33 The diagram shows a pond drawn on a grid of squares.
The area is found by counting squares.
Give one way to improve the accuracy of the estimate.



Estimate the fraction of each
part square inside the outline

1 / 1

- 34 The diagram shows a flower bed on a grid.
Each square represents an area of 4 m^2 .
Work out an upper estimate for the area of the flower bed.

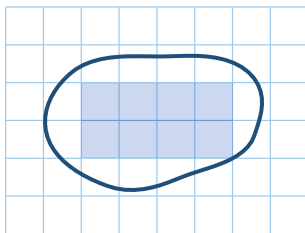


whole squares 14 + part squares 18 = 32 squares
 $32 \times 4 = 128 \text{ m}^2$

128 m²

1 / 1

- 35 The diagram shows an oil spill on a grid.
Each square represents an area of 9 m^2 .
Work out a lower estimate for the area of the oil spill.

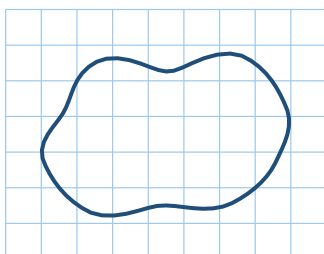


whole squares = 8
 $8 \times 9 = 72 \text{ m}^2$

72 m²

1 / 1

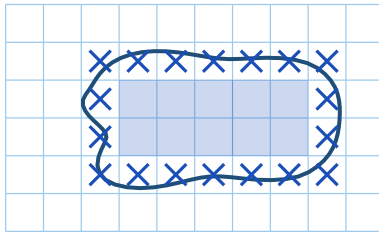
- 36 The diagram shows a footprint drawn on a grid of squares.
The area is found by counting squares.
Give one way to improve the accuracy of the estimate.



Use a grid with smaller squares

1 / 1

- 37 The diagram shows a leaf on a grid.
The side of each square represents 0.5 cm.
Work out an upper estimate for the area of the leaf.

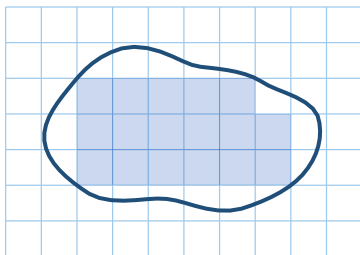


area of one square = $0.5 \times 0.5 = 0.25 \text{ cm}^2$
whole squares 10 + part squares 18 = 28
squares
 $28 \times 0.25 = 7 \text{ cm}^2$

7 cm²

1 / 1

- 38 The diagram shows a pond on a grid.
The side of each square represents 2 m.
Work out a lower estimate for the area of the pond.

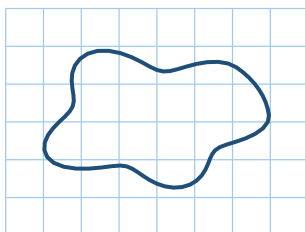


area of one square = $2 \times 2 = 4 \text{ m}^2$
whole squares = 17
 $17 \times 4 = 68 \text{ m}^2$

68 m²

1 / 1

- 39 The diagram shows a leaf drawn on a grid of squares.
Tom says: "I counted the squares so my answer is exact." Explain why Tom is wrong.

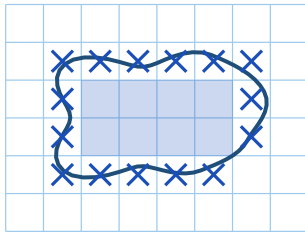


The part squares are only partly covered, so
counting squares only gives an estimate

The part squares are only partly
covered

1 / 1

- 40 The diagram shows a pond on a grid.
Each square represents an area of 1 m^2 .
Work out an upper estimate for the area of the pond.

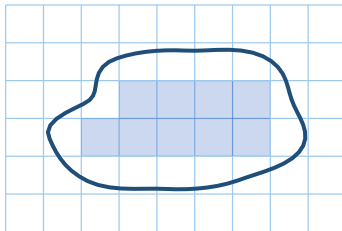


whole squares 8 + part squares 15 = 23 squares
 $23 \times 1 = 23 \text{ m}^2$

23 m²

1 / 1

- 41 The diagram shows a lake on a grid.
The side of each square represents 50 m.
Use the whole squares to work out a lower estimate of the area in m^2 .

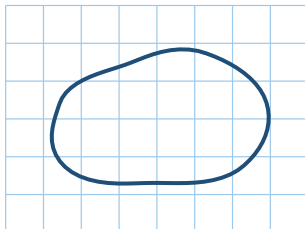


one square = 2,500 m²
 $9 \times 2,500 = 22,500 \text{ m}^2$

22,500 m²

2 / 2

- 42 The diagram shows a pond drawn on a grid of squares.
Tom says: "I counted the squares so my answer is exact." Explain why Tom is wrong.

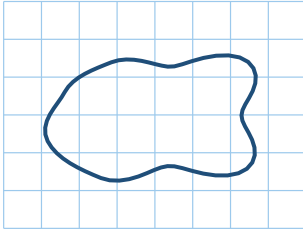


The part squares are only partly covered, so counting squares only gives an estimate

The part squares are only partly covered

2 / 2

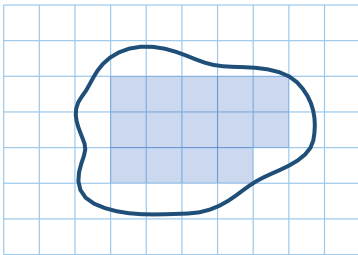
- 43 The diagram shows a leaf drawn on a grid of squares.
The area is found by counting squares.
How could the estimate be made more accurate?



Use a grid with smaller squares

2 / 2

- 44 The diagram shows a lake on a grid.
The side of each square represents 10 m.
Use the whole squares to work out a lower estimate of the area in m^2 .

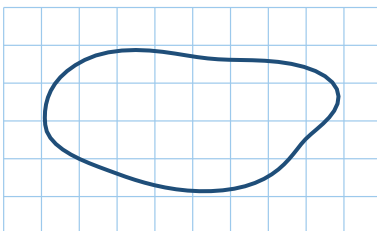


*one square = $100 m^2$
 $14 \times 100 = 1,400 m^2$*

1,400 m^2

2 / 2

- 45 The diagram shows an oil spill drawn on a grid of squares.
Is the area found by counting every part square as a whole square bigger or smaller than the true area? Give a reason.

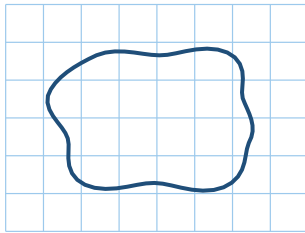


Bigger, because the part squares are only partly inside the outline but have been counted as whole squares

Bigger

2 / 2

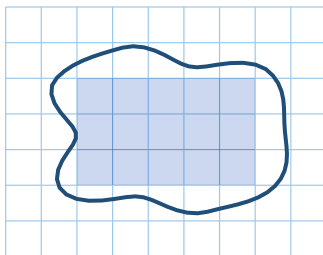
- 46 The diagram shows a leaf drawn on a grid of squares.
The area is found by counting squares.
Give one way to improve the accuracy of the estimate.



Use a grid with smaller squares

2 / 2

- 47 The diagram shows an oil spill on a grid.
The side of each square represents 3 m.
Use the whole squares to work out a lower estimate of the area in m^2 .

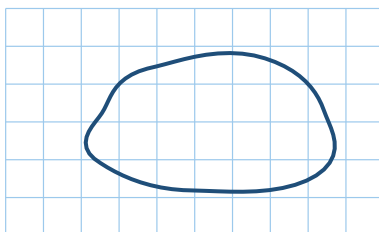


$$\begin{aligned} \text{one square} &= 9 \text{ m}^2 \\ 15 \times 9 &= 135 \text{ m}^2 \end{aligned}$$

135 m²

2 / 2

- 48 The diagram shows an oil spill drawn on a grid of squares.
Tom says: "I counted the squares so my answer is exact." Explain why Tom is wrong.

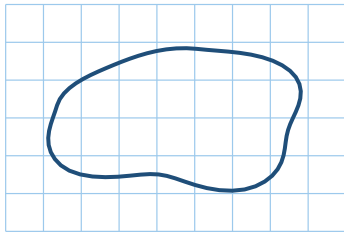


The part squares are only partly covered, so counting squares only gives an estimate

The part squares are only partly covered

2 / 2

- 49 The diagram shows an oil spill drawn on a grid of squares.
The area is found by counting squares.
Give one way to improve the accuracy of the estimate.



Use a grid with smaller squares

2 / 2

- 50 An island is drawn on a grid of squares.
16 squares are completely inside the outline and 18 squares are partly inside the outline.
The side of each square represents 2 km.
Write down the range in which the area lies.

area of one square = $2 \times 2 = 4 \text{ km}^2$

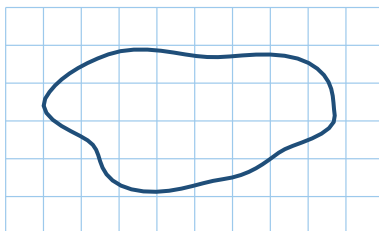
lower estimate 64

upper estimate 136

between 64 km^2 and 136 km^2

2 / 2

- 51 The diagram shows a leaf drawn on a grid of squares.
Is the area found by counting every part square as a whole square bigger or smaller than the true area? Give a reason.

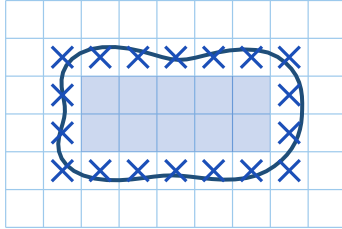


Bigger, because the part squares are only partly inside the outline but have been counted as whole squares

Bigger

2 / 2

- 52 The diagram shows an oil spill on a grid.
The side of each square represents 3 m.
Work out a lower estimate and an upper estimate for the area.
Write down the range in which the area lies.



area of one square = $3 \times 3 = 9 \text{ m}^2$
lower estimate: $10 \times 9 = 90$
upper estimate: $(10 + 18) \times 9 = 252$

between 90 m^2 and 252 m^2

2 / 2

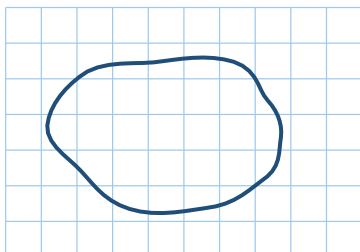
- 53 An island is drawn on a grid of squares.
17 squares are completely inside the outline and 15 squares are partly inside the outline.
Each square represents an area of 1 km^2 .
Write down the range in which the area lies.

lower estimate 17
upper estimate 32

between 17 km^2 and 32 km^2

2 / 2

- 54 The diagram shows a footprint drawn on a grid of squares.
Is the area found by counting every part square as a whole square bigger or smaller than the true area? Give a reason.

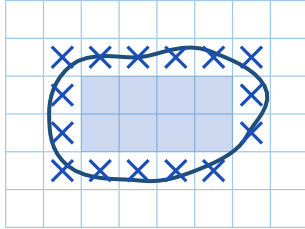


Bigger, because the part squares are only partly inside the outline but have been counted as whole squares

Bigger

2 / 2

- 55 The diagram shows a leaf on a grid.
The side of each square represents 0.5 cm.
Work out a lower estimate and an upper estimate for the area.
Write down the range in which the area lies.



$$\begin{aligned} \text{area of one square} &= 0.5 \times 0.5 = 0.25 \text{ cm}^2 \\ \text{lower estimate: } 8 \times 0.25 &= 2 \\ \text{upper estimate: } (8 + 15) \times 0.25 &= 5.75 \end{aligned}$$

between 2 cm^2 and 5.75 cm^2

/ 2

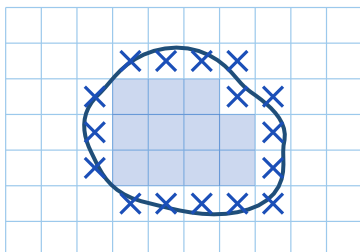
- 56 A footprint is drawn on a grid of squares.
9 squares are completely inside the outline and 12 squares are partly inside the outline.
The side of each square represents 2 cm.
Write down the range in which the area lies.

$$\begin{aligned} \text{area of one square} &= 2 \times 2 = 4 \text{ cm}^2 \\ \text{lower estimate } 36 \\ \text{upper estimate } 84 \end{aligned}$$

between 36 cm^2 and 84 cm^2

/ 2

- 57 The diagram shows a flower bed on a grid.
The side of each square represents 2 m.
Work out an estimate for the area by counting two part squares as one whole square.

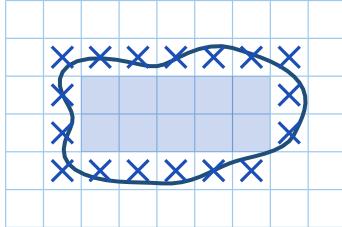


$$\begin{aligned} \text{area of one square} &= 2 \times 2 = 4 \text{ m}^2 \\ \text{whole squares } 11 \\ 16 \text{ part squares} &= 8 \text{ whole squares} \\ \text{total } 19 \text{ squares} \\ 19 \times 4 &= 76 \text{ m}^2 \end{aligned}$$

76 m^2

/ 2

- 58 The diagram shows a leaf on a grid.
The side of each square represents 2 cm.
Work out a lower estimate and an upper estimate for the area.
Write down the range in which the area lies.



area of one square = $2 \times 2 = 4 \text{ cm}^2$
lower estimate: $10 \times 4 = 40$
upper estimate: $(10 + 17) \times 4 = 108$

between 40 cm^2 and 108 cm^2

/ 2

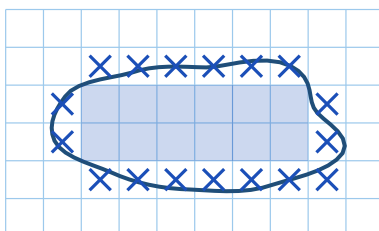
- 59 A footprint is drawn on a grid of squares.
11 squares are completely inside the outline and 19 squares are partly inside the outline.
Each square represents an area of 4 cm^2 .
Write down the range in which the area lies.

lower estimate 44
upper estimate 120

between 44 cm^2 and 120 cm^2

/ 2

- 60 The diagram shows a pond on a grid.
The side of each square represents 2 m.
Work out an estimate for the area by counting two part squares as one whole square.

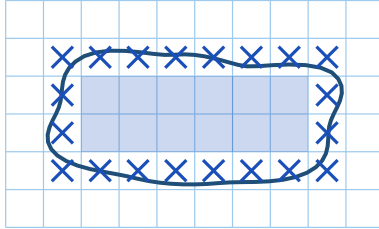


area of one square = $2 \times 2 = 4 \text{ m}^2$
whole squares 12
17 part squares = 8.5 whole squares
total 20.5 squares
 $20.5 \times 4 = 82 \text{ m}^2$

82 m^2

/ 2

- 61 The diagram shows an oil spill on a grid.
Each square represents an area of 9 m^2 .
Work out a lower estimate and an upper estimate for the area.
Write down the range in which the area lies.



lower estimate: $12 \times 9 = 108$
upper estimate: $(12 + 20) \times 9 = 288$

between 108 m^2 and 288 m^2

/ 2

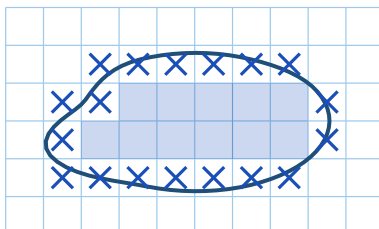
- 62 A footprint is drawn on a grid of squares.
16 squares are completely inside the outline and 16 squares are partly inside the outline.
The side of each square represents 2 cm.
Write down the range in which the area lies.

area of one square = $2 \times 2 = 4 \text{ cm}^2$
lower estimate 64
upper estimate 128

between 64 cm^2 and 128 cm^2

/ 2

- 63 The diagram shows an oil spill on a grid.
The side of each square represents 3 m.
Work out an estimate for the area by counting two part squares as one whole square.

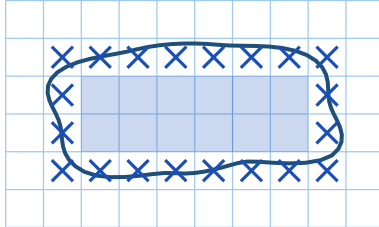


area of one square = $3 \times 3 = 9 \text{ m}^2$
whole squares 11
18 part squares = 9 whole squares
total 20 squares
 $20 \times 9 = 180 \text{ m}^2$

180 m^2

/ 2

- 64 The diagram shows a flower bed on a grid.
Each square represents an area of 1 m^2 .
Work out a lower estimate and an upper estimate for the area.
Write down the range in which the area lies.



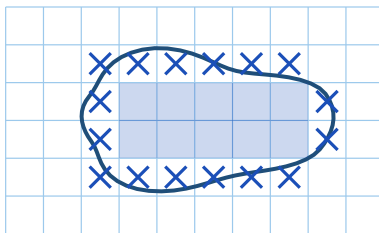
lower estimate: $12 \times 1 = 12$

upper estimate: $(12 + 20) \times 1 = 32$

between 12 m^2 and 32 m^2

2 / 2

- 65 The diagram shows a flower bed on a grid.
The side of each square represents 2 m.
Work out the difference between the upper estimate and the lower estimate of the area.



area of one square = $2 \times 2 = 4 \text{ m}^2$

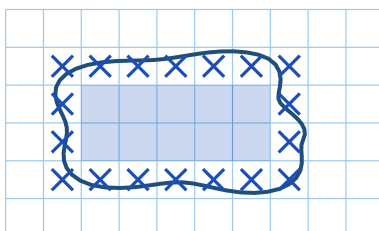
difference = number of part squares = 16

$16 \times 4 = 64 \text{ m}^2$

64 m^2

2 / 2

- 66 The diagram shows an oil spill on a grid.
Each square represents an area of 25 m^2 .
Work out an estimate for the area by counting two part squares as one whole square.



whole squares 10

18 part squares = 9 whole squares

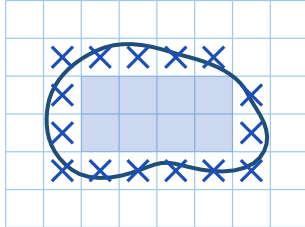
total 19 squares

$19 \times 25 = 475 \text{ m}^2$

475 m^2

2 / 2

- 67 The diagram shows an island on a grid.
Each square represents an area of 1 km^2 .
Work out a lower estimate and an upper estimate for the area.
Write down the range in which the area lies.



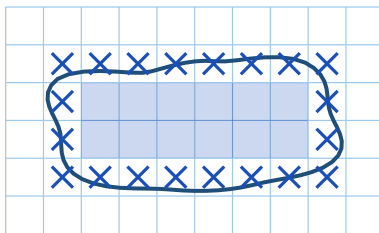
lower estimate: $8 \times 1 = 8$

upper estimate: $(8 + 15) \times 1 = 23$

between 8 km^2 and 23 km^2

2 / 2

- 68 The diagram shows a leaf on a grid.
The side of each square represents 2 cm.
Work out the difference between the upper estimate and the lower estimate of the area.



area of one square = $2 \times 2 = 4 \text{ cm}^2$

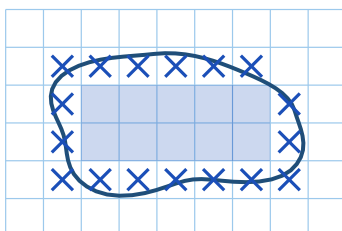
difference = number of part squares = 20

$20 \times 4 = 80 \text{ cm}^2$

80 cm^2

2 / 2

- 69 The diagram shows a lake on a grid.
Each square represents an area of 100 m^2 .
Work out an estimate for the area by counting two part squares as one whole square.



whole squares 10

17 part squares = 8.5 whole squares

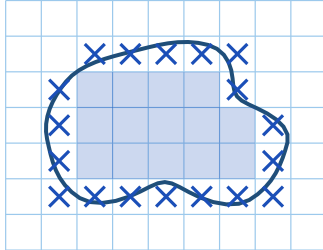
total 18.5 squares

$18.5 \times 100 = 1,850 \text{ m}^2$

$1,850 \text{ m}^2$

2 / 2

- 70 The diagram shows an island on a grid.
The side of each square represents 2 km.
Work out a lower estimate and an upper estimate for the area.
Write down the range in which the area lies.

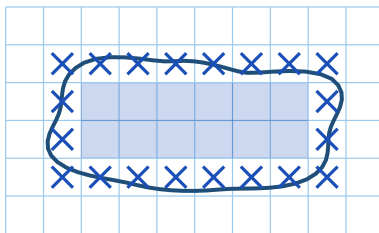


area of one square = $2 \times 2 = 4 \text{ km}^2$
lower estimate: $14 \times 4 = 56$
upper estimate: $(14 + 18) \times 4 = 128$

between 56 km^2 and 128 km^2

2 / 2

- 71 The diagram shows an oil spill on a grid.
Each square represents an area of 25 m^2 .
Work out the difference between the upper estimate and the lower estimate of the area.

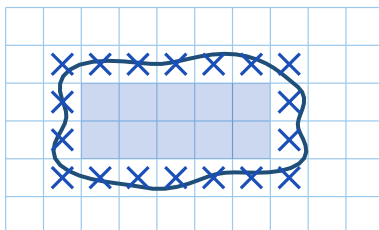


difference = number of part squares = 20
 $20 \times 25 = 500 \text{ m}^2$

500 m²

2 / 2

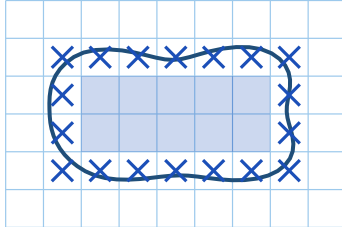
- 72 The diagram shows a pond on a grid.
Each square represents an area of 4 m^2 .
(a) Work out the area of the whole grid (the rectangle) in m^2 .
(b) Explain why the area of the pond must be less than your answer to part (a).



(a) 240 m^2 (b) the pond is inside the rectangle, so its area is smaller

2 / 2

- 73 The diagram shows a leaf on a grid.
Each square represents an area of 1 cm^2 .
Work out a lower estimate and an upper estimate for the area.
Write down the range in which the area lies.



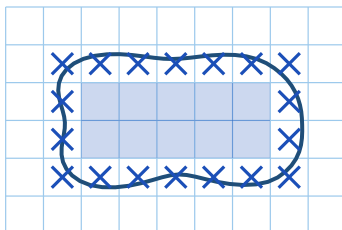
lower estimate: $10 \times 1 = 10$

upper estimate: $(10 + 18) \times 1 = 28$

between 10 cm^2 and 28 cm^2

2 / 2

- 74 The diagram shows a leaf on a grid.
The side of each square represents 0.5 cm .
Work out the difference between the upper estimate and the lower estimate of the area.



area of one square = $0.5 \times 0.5 = 0.25 \text{ cm}^2$

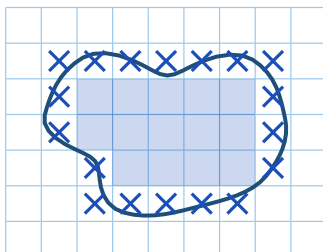
difference = number of part squares = 18

$18 \times 0.25 = 4.5 \text{ cm}^2$

4.5 cm^2

2 / 2

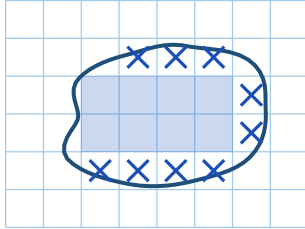
- 75 The diagram shows an oil spill on a grid.
The side of each square represents 3 m .
(a) Work out the area of the whole grid (the rectangle) in m^2 .
(b) Explain why the area of the oil spill must be less than your answer to part (a).



(a) 567 m^2 (b) the oil spill is inside the rectangle, so its area is smaller

2 / 2

- 76 The diagram shows an oil spill on a grid.
The side of each square represents 3 m.
Estimate the area. Count a part square as a whole square if more than half of it is inside the outline, and ignore it if less than half.

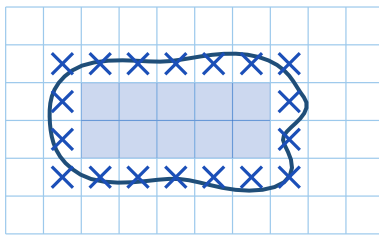


area of one square = $3 \times 3 = 9 \text{ m}^2$
whole squares 8
part squares more than half covered 9
total 17 squares
 $17 \times 9 = 153 \text{ m}^2$

153 m²

3 / 3

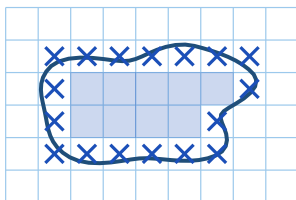
- 77 The diagram shows a pond on a grid.
Each square represents an area of 1 m².
(a) Work out the area of the whole grid (the rectangle) in m².
(b) Explain why the area of the pond must be less than your answer to part (a).



(a) 60 m² (b) the pond is
inside the rectangle, so its area
is smaller

3 / 3

- 78 The diagram shows a lawn on a grid.
Each square represents an area of 1 m².
Count two part squares as one whole square.
Grass seed costs £2 for each m². Estimate the cost of seed for the whole lawn.

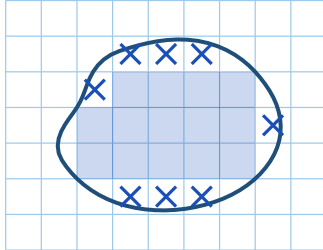


$9 + 17 \div 2 = 17.5 \text{ squares}$
area = $17.5 \times 1 = 17.5 \text{ m}^2$
cost = $17.5 \times £2 = £35$

£35

3 / 3

- 79 The diagram shows an island on a grid.
Each square represents an area of 4 km^2 .
Estimate the area. Count a part square as a whole square if more than half of it is inside the outline, and ignore it if less than half.

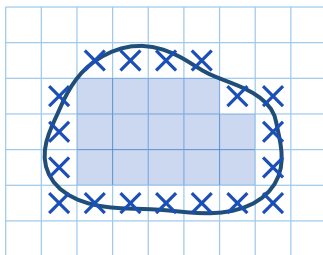


whole squares 14
part squares more than half covered 8
total 22 squares
 $22 \times 4 = 88 \text{ km}^2$

88 km²

3 / 3

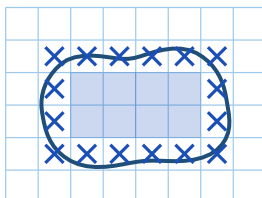
- 80 The diagram shows a flower bed on a grid.
Each square represents an area of 1 m^2 .
(a) Work out the area of the whole grid (the rectangle) in m^2 .
(b) Explain why the area of the flower bed must be less than your answer to part (a).



(a) 63 m^2 (b) the flower bed is inside the rectangle, so its area is smaller

3 / 3

- 81 The diagram shows a patio on a grid.
Each square represents an area of 1 m^2 .
Count two part squares as one whole square.
Paving costs $\text{£}30$ per m^2 . Estimate the cost of paving the whole patio.

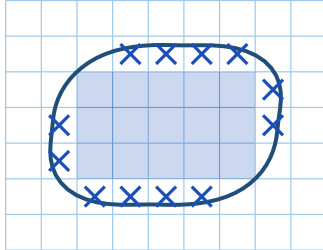


$8 + 16 \div 2 = 16$ squares
area = $16 \times 1 = 16 \text{ m}^2$
cost = $16 \times \text{£}30 = \text{£}480$

£480

3 / 3

- 82 The diagram shows a leaf on a grid.
Each square represents an area of 1 cm^2 .
Estimate the area. Count a part square as a whole square if more than half of it is inside the outline, and ignore it if less than half.

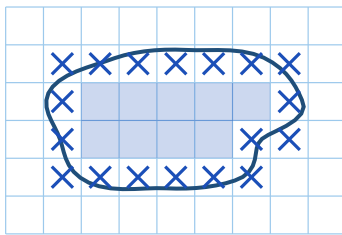


whole squares 15
part squares more than half covered 12
total 27 squares
 $27 \times 1 = 27 \text{ cm}^2$

27 cm^2

3 / 3

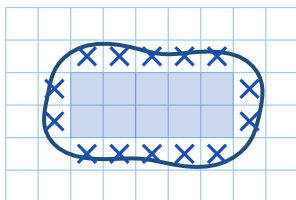
- 83 The diagram shows a pond on a grid.
The side of each square represents 0.5 m.
(a) Work out the area of the whole grid (the rectangle) in m^2 .
(b) Explain why the area of the pond must be less than your answer to part (a).



(a) 13.5 m^2 (b) the pond is
inside the rectangle, so its area
is smaller

3 / 3

- 84 The diagram shows a flower bed on a grid.
Each square represents an area of 1 m^2 .
Count a part square only if more than half of it is inside the outline.
Compost costs $\text{£}2.50$ per m^2 . Estimate the cost of compost for the whole bed.

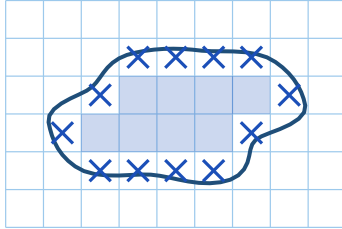


whole squares 10 + part squares more than half 14 =
24 squares
area = $24 \times 1 = 24 \text{ m}^2$
cost = $24 \times \text{£}2.50 = \text{£}60$

£60

3 / 3

- 85 The diagram shows a lake on a grid.
The side of each square represents 50 m.
Estimate the area. Count a part square as a whole square if more than half of it is inside the outline, and ignore it if less than half.

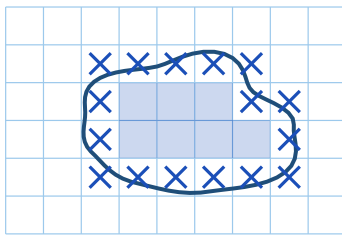


area of one square = $50 \times 50 = 2,500 \text{ m}^2$
 whole squares 8
 part squares more than half covered 12
 total 20 squares
 $20 \times 2,500 = 50,000 \text{ m}^2$

50,000 m²

3 / 3

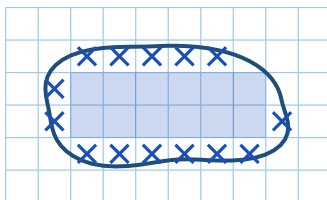
- 86 The diagram shows a pond on a grid.
The side of each square represents 2 m.
(a) Work out the area of the whole grid (the rectangle) in m².
(b) Explain why the area of the pond must be less than your answer to part (a).



(a) 216 m² (b) the pond is
 inside the rectangle, so its area
 is smaller

3 / 3

- 87 The diagram shows a field on a grid.
The side of each square represents 10 m.
Count a part square only if more than half of it is inside the outline.
Fertiliser costs £1.50 per m². Estimate the cost of fertiliser for the whole field.

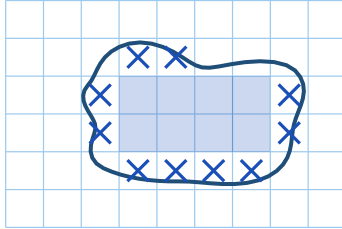


area of one square = $10 \times 10 = 100 \text{ m}^2$
 whole squares 12 + part squares more than half 14
 = 26 squares
 area = $26 \times 100 = 2,600 \text{ m}^2$
 cost = $2,600 \times £1.50 = £3,900$

£3,900

3 / 3

- 88 The diagram shows an island on a grid.
The side of each square represents 0.5 km.
Estimate the area. Count a part square as a whole square if more than half of it is inside the outline, and ignore it if less than half.

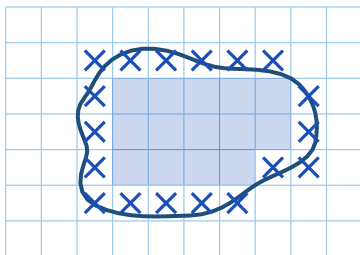


area of one square = $0.5 \times 0.5 = 0.25 \text{ km}^2$
 whole squares 8
 part squares more than half covered 10
 total 18 squares
 $18 \times 0.25 = 4.5 \text{ km}^2$

4.5 km²

3 / 3

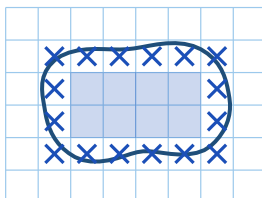
- 89 The diagram shows an oil spill on a grid.
Each square represents an area of 25 m².
(a) Work out the area of the whole grid (the rectangle) in m².
(b) Explain why the area of the oil spill must be less than your answer to part (a).



(a) 1,750 m² (b) the oil spill is inside the rectangle, so its area is smaller

3 / 3

- 90 The diagram shows a field on a grid.
The side of each square represents 10 m.
Count two part squares as one whole square.
Fertiliser costs £0.50 per m². Estimate the cost of fertiliser for the whole field.

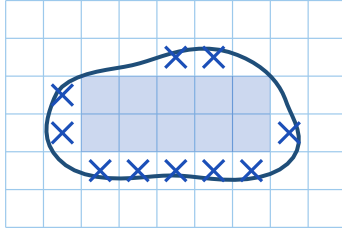


area of one square = $10 \times 10 = 100 \text{ m}^2$
 $8 + 16 \div 2 = 16 \text{ squares}$
 area = $16 \times 100 = 1,600 \text{ m}^2$
 cost = $1,600 \times £0.50 = £800$

£800

3 / 3

- 91 The diagram shows a footprint on a grid. Each square represents an area of 4 cm^2 . Estimate the area. Count a part square as a whole square if more than half of it is inside the outline, and ignore it if less than half.



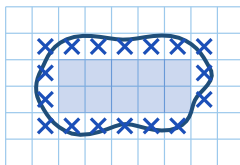
whole squares 10
part squares more than half covered 10
total 20 squares
 $20 \times 4 = 80 \text{ cm}^2$

80 cm^2

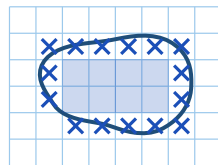
3 / 3

- 92 The diagram shows two shapes on grids of squares. Each square represents an area of 1 km^2 . Which shape has the greater area? Estimate each area by counting two part squares as one whole square. You must show your working.

Shape A



Shape B

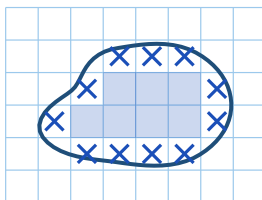


Shape A: $10 + 17 \div 2 = 18.5$
squares = 18.5 km^2
shape B: $8 + 15 \div 2 = 15.5$
squares = 15.5 km^2

Shape A (18.5 km^2 compared with 15.5 km^2)

3 / 3

- 93 The diagram shows a lawn on a grid. Each square represents an area of 4 m^2 . Count a part square only if more than half of it is inside the outline. Grass seed costs $\text{£}2.50$ for each m^2 . Estimate the cost of seed for the whole lawn.

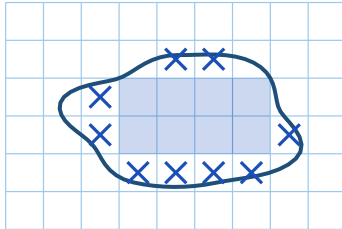


whole squares 7 + part squares more than half 11 = 18
squares
area = $18 \times 4 = 72 \text{ m}^2$
cost = $72 \times \text{£}2.50 = \text{£}180$

£180

3 / 3

- 94 The diagram shows an island on a grid.
Each square represents an area of 1 km^2 .
Estimate the area. Count a part square as a whole square if more than half of it is inside the outline, and ignore it if less than half.



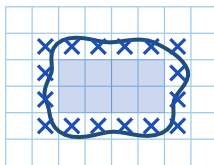
whole squares 8
part squares more than half covered 9
total 17 squares
 $17 \times 1 = 17 \text{ km}^2$

17 km^2

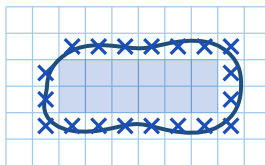
3 / 3

- 95 The diagram shows two shapes on grids of squares.
The side of each square represents 2 km.
Which shape has the greater area? Estimate each area by counting two part squares as one whole square.
You must show your working.

Shape A



Shape B

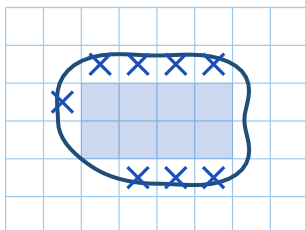


area of one square = $2 \times 2 = 4 \text{ km}^2$
Shape A: $8 + 16 \div 2 = 16 \text{ squares} = 64 \text{ km}^2$
Shape B: $12 + 19 \div 2 = 21.5 \text{ squares} = 86 \text{ km}^2$

Shape B (86 km^2 compared with 64 km^2)

3 / 3

- 96 The diagram shows a lake on a grid.
Each square represents an area of 25 m^2 .
Estimate the area. Count a part square as a whole square if more than half of it is inside the outline, and ignore it if less than half.



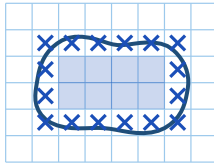
whole squares 8
part squares more than half covered 8
total 16 squares
 $16 \times 25 = 400 \text{ m}^2$

400 m^2

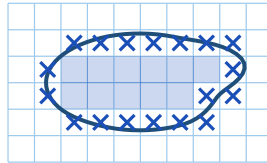
3 / 3

- 97 The diagram shows two shapes on grids of squares.
Each square represents an area of 100 m^2 .
Which shape has the greater area? Estimate each area by counting two part squares as one whole square.
You must show your working.

Shape A



Shape B



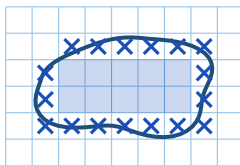
$$\begin{aligned}\text{Shape A: } 8 + 16 \div 2 &= 16 \\ \text{squares} &= 1,600 \text{ m}^2 \\ \text{shape B: } 11 + 18 \div 2 &= 20 \\ \text{squares} &= 2,000 \text{ m}^2\end{aligned}$$

Shape B ($2,000 \text{ m}^2$ compared with $1,600 \text{ m}^2$)

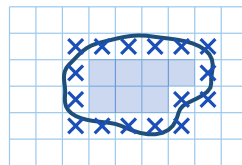
3 / 3

- 98 The diagram shows two shapes on grids of squares.
The side of each square represents 2 cm .
Which shape has the greater area? Estimate each area by counting two part squares as one whole square.
You must show your working.

Shape A



Shape B



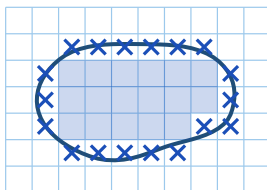
$$\begin{aligned}\text{area of one square} &= 2 \times 2 = 4 \text{ cm}^2 \\ \text{Shape A: } 10 + 17 \div 2 &= 18.5 \text{ squares} \\ &= 74 \text{ cm}^2 \\ \text{shape B: } 7 + 16 \div 2 &= 15 \text{ squares} = \\ &= 60 \text{ cm}^2\end{aligned}$$

Shape A (74 cm^2 compared with 60 cm^2)

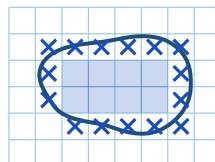
3 / 3

- 99 The diagram shows two shapes on grids of squares.
The side of each square represents 0.5 cm .
Which shape has the greater area? Estimate each area by counting two part squares as one whole square.
You must show your working.

Shape A



Shape B



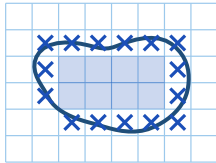
$$\begin{aligned}\text{area of one square} &= 0.5 \times 0.5 = 0.25 \text{ cm}^2 \\ \text{Shape A: } 17 + 18 \div 2 &= 26 \text{ squares} = 6.5 \\ \text{cm}^2 \\ \text{shape B: } 8 + 15 \div 2 &= 15.5 \text{ squares} = 3.875 \\ \text{cm}^2\end{aligned}$$

Shape A (6.5 cm^2 compared with 3.875 cm^2)

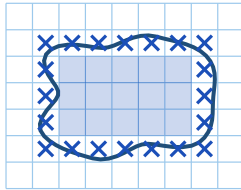
3 / 3

- 100** The diagram shows two shapes on grids of squares.
Each square represents an area of 1 m^2 .
Which shape has the greater area? Estimate each area by counting two part squares as one whole square.
You must show your working.

Shape A



Shape B



$$\begin{aligned}\text{Shape A: } 8 + 15 \div 2 &= 15.5 \\ \text{squares} &= 15.5 \text{ m}^2 \\ \text{shape B: } 15 + 20 \div 2 &= 25 \\ \text{squares} &= 25 \text{ m}^2\end{aligned}$$

Shape B (25 m^2 compared with 15.5 m^2)