

Reasoning and Problem Solving

Step 6: Area of a Parallelogram

National Curriculum Objectives:

Mathematics Year 6: (6M7b) [Calculate the area of parallelograms and triangles](#)

Mathematics Year 6: (6M7c) [Recognise when it is possible to use formulae for the area of shapes](#)

Differentiation:

Questions 1, 4 and 7 (Reasoning)

Developing Use knowledge of area to explain whether the given area of a parallelogram is correct. Use of the formula: base x perpendicular height. Whole numbers only.

Expected Use knowledge of area to explain whether the given area of a parallelogram is correct. Use of the formula: base x perpendicular height. Includes some conversions (mm to cm) and some decimals (halves only). Children to select the base and perpendicular height from given measurements.

Greater Depth Use knowledge of area to explain whether the given area of a parallelogram is correct. Use of the formula: base x perpendicular height. Includes some conversions (mm to cm, cm to m and mm to m) and some decimals (halves and tenths). Children to select the base and perpendicular height from given measurements.

Questions 2, 5 and 8 (Problem Solving)

Developing Find the number of parallelograms needed to cover a given area.

Differentiation as described for Question 1.

Expected Find the number of parallelograms needed to cover a given area. Differentiation as described for Question 1.

Greater Depth Find the number of parallelograms needed to cover a given area.

Differentiation as described for Question 1.

Questions 3, 6 and 9 (Reasoning)

Developing Explain whether the statement is correct. Differentiation as described for Question 1.

Expected Explain whether the statement is correct. Differentiation as described for Question 1.

Greater Depth Explain whether the statement is correct. Differentiation as described for Question 1.

More [Year 6 Perimeter, Area and Volume](#) resources.

Did you like this resource? Don't forget to [review](#) it on our website.

Area of a Parallelogram

Area of a Parallelogram

1a. Keon says that half the area of the parallelogram below is 24cm^2 .



Use the formula base \times perpendicular height to prove whether Keon is correct.



Not to scale

R

1b. Joslyn says that half the area of the parallelogram below is 20cm^2 .



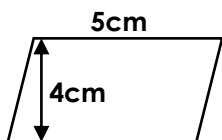
Use the formula base \times perpendicular height to prove whether Joslyn is correct.



Not to scale

R

2a. Connor is tiling part of a swimming pool. The tiles are parallelograms.



The area he wants to cover is $400\text{cm} \times 200\text{cm}$.

The area needs to be completely covered. How many tiles will he need?

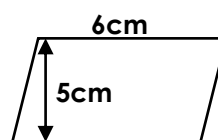
Show your working.



Not to scale

PS

2b. Larry is covering part of a floor with tiles. The tiles are parallelograms.



The area he wants to cover is $300\text{cm} \times 200\text{cm}$.

The area needs to be completely covered. How many tiles will he need?

Show your working.



Not to scale

PS

3a. Sanaa has drawn a parallelogram.

She says,



The area of my parallelogram is 21cm^2 and the base is 7cm , so the perpendicular height must be 2cm .

Is she correct? Explain your answer.



Not to scale

R

3b. Kale has drawn a parallelogram.

He says,



The area of my parallelogram is 36cm^2 and the base is 6cm , so the perpendicular height must be 6cm .

Is he correct? Explain your answer.



Not to scale

R

Area of a Parallelogram

Area of a Parallelogram

4a. Daniel says that half the area of the parallelogram below is 60cm^2 .



Use the formula base \times perpendicular height to prove whether Daniel is correct.



Not to scale

R

4b. Julia says that half the area of the parallelogram below is 36mm^2 .



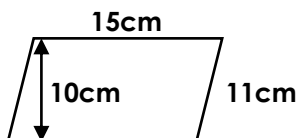
Use the formula base \times perpendicular height to prove whether Julia is correct.



Not to scale

R

5a. Clive is paving part of his garden. The paving stones are parallelograms.



The area he wants to cover is $400\text{cm} \times 150\text{cm}$.

The area needs to be completely covered. How many paving stones will he need?

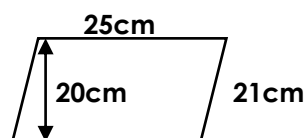
Show your working.



Not to scale

PS

5b. Frazer is tiling part of a bathroom. The tiles are parallelograms.



The area he wants to cover is $500\text{cm} \times 250\text{cm}$.

The area needs to be completely covered. How many tiles will he need?

Show your working.



Not to scale

PS

6a. Jenni has drawn a parallelogram.

She says,



The area of my parallelogram is 60cm^2 and the base is 240mm , so the perpendicular height must be 2cm .

Is she correct? Explain your answer.



Not to scale

R

6b. Silas has drawn a parallelogram.

He says,



The area of my parallelogram is 55cm^2 and the base is 100mm , so the perpendicular height must be 5cm .

Is he correct? Explain your answer.



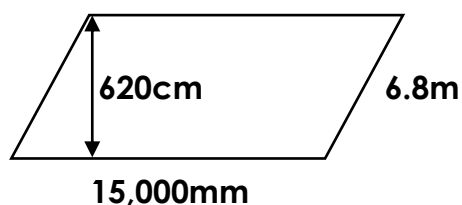
Not to scale

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Area of a Parallelogram

Area of a Parallelogram

7a. Judah says that half the area of the parallelogram below is 46m^2 .



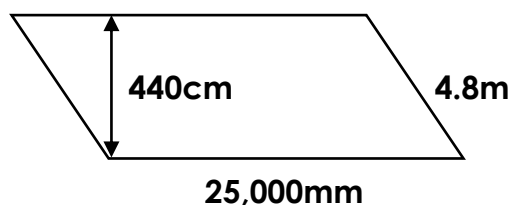
Use the formula base \times perpendicular height to prove whether Judah is correct.



Not to scale

R

7b. Miley says that half the area of the parallelogram below is 56m^2 .



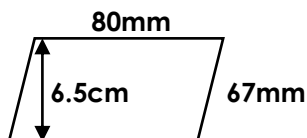
Use the formula base \times perpendicular height to prove whether Miley is correct.



Not to scale

R

8a. Ivy is creating part of a patchwork quilt. The patches are parallelograms.



The area she wants to cover is $8\text{m} \times 0.13\text{m}$.

The area needs to be completely covered. How many patches will she need?

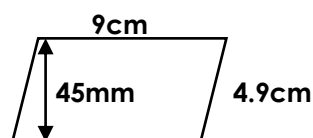
Show your working.



Not to scale

PS

8b. Lionel is paving part of a garden path. The paving stones are parallelograms.



The area he wants to cover is $90\text{cm} \times 0.9\text{m}$.

The area needs to be completely covered. How many paving stones will he need?

Show your working.



Not to scale

PS

9a. Lilah has drawn a parallelogram.

She says,



The area of my parallelogram is 75cm^2 and the base is 0.15m , so the perpendicular height must be 500mm .

Is she correct? Explain your answer.



Not to scale

R

9b. Kylo has drawn a parallelogram.

He says,



The area of my parallelogram is 77cm^2 and the base is 0.22m , so the perpendicular height must be 30mm .

Is he correct? Explain your answer.



Not to scale

R

Reasoning and Problem Solving

Area of a Parallelogram

Developing

1a. No; the area of the parallelogram is $6\text{cm} \times 4\text{cm} = 24\text{cm}^2$, so half the area of the parallelogram is $24\text{cm}^2 \div 2 = 12\text{cm}^2$, not 24cm^2 .

2a. 4,000 tiles; the area of each tile is 20cm^2 ($5\text{cm} \times 4\text{cm}$) and the area of the pool he wants to tile is $80,000\text{cm}^2$ ($400\text{cm} \times 200\text{cm}$). $80,000\text{cm}^2 \div 20\text{cm}^2 = 4,000$.

3a. No; $21\text{cm}^2 \div 7\text{cm} = 3\text{cm}$, not 2cm .

Expected

4a. No; the area of the parallelogram is $12\text{cm} \times 5.5\text{cm} = 66\text{cm}^2$, so half the area of the parallelogram is $66\text{cm}^2 \div 2 = 33\text{cm}^2$, not 60cm^2 .

5a. 400 paving stones; the area of each stone is 150cm^2 ($15\text{cm} \times 10\text{cm}$) and the area of the garden he wants to cover is $60,000\text{cm}^2$ ($400\text{cm} \times 150\text{cm}$). $60,000\text{cm}^2 \div 150\text{cm}^2 = 400$.

6a. No; $60\text{cm}^2 \div 24\text{cm} = 2.5\text{cm}$, not 2cm .

Greater Depth

7a. No; the area of the parallelogram is $15\text{m} \times 6.2\text{m} = 93\text{m}^2$, so half the area of the parallelogram is $93\text{m}^2 \div 2 = 46.5\text{m}^2$, not 46m^2 .

8a. 200 patches; the area of each patch is 52cm^2 ($8\text{cm} \times 6.5\text{m}$) and the area of the quilt she is creating is $10,400\text{cm}^2$ ($800\text{cm} \times 13\text{cm}$). $10,400\text{cm}^2 \div 52\text{cm}^2 = 200$.

9a. No; $75\text{cm} \div 15\text{cm} = 5\text{cm}$ (which is 50mm , not 500mm).

Reasoning and Problem Solving

Area of a Parallelogram

Developing

1b. Yes; the area of the parallelogram is $8\text{cm} \times 5\text{cm} = 40\text{cm}^2$, so half the area of the parallelogram is $40\text{cm}^2 \div 2 = 20\text{cm}^2$.

2b. 2,000 tiles; the area of each tile is 30cm^2 ($6\text{cm} \times 5\text{cm}$) and the area of the floor he wants to cover is $60,000\text{cm}^2$ ($300\text{cm} \times 200\text{cm}$). $60,000\text{cm}^2 \div 30\text{cm}^2 = 2,000$.

3b. Yes; $36\text{cm}^2 \div 6\text{cm} = 6\text{cm}$.

Expected

4b. No; the area of the parallelogram is $16\text{cm} \times 0.45\text{cm} = 72\text{cm}^2$, so half the area of the parallelogram is $72\text{cm}^2 \div 2 = 36\text{cm}^2$, not 36mm^2 .

5b. 250 tiles; the area of each tile is 500cm^2 ($25\text{cm} \times 20\text{cm}$) and the area of the bathroom he wants to tile is $125,000\text{cm}^2$ ($500\text{cm} \times 250\text{cm}$). $125,000\text{cm}^2 \div 500\text{cm}^2 = 250$.

6b. No; $55\text{cm}^2 \div 10\text{cm} = 5.5\text{cm}$, not 5cm .

Greater Depth

7b. Yes; the area of the parallelogram is $25\text{m} \times 4.4\text{m} = 110\text{m}^2$, so half the area of the parallelogram is $110\text{m}^2 \div 2 = 55\text{m}^2$.

8b. 200 paving stones; the area of each stone is 40.5cm^2 ($9\text{cm} \times 4.5\text{cm}$) and the area of the path he wants to cover is $8,100\text{cm}^2$ ($90\text{cm} \times 90\text{cm}$). $8,100\text{cm}^2 \div 40.5\text{cm}^2 = 200$.

9b. No; $77\text{cm}^2 \div 22\text{cm} = 3.5\text{cm}$ (which is 35mm , not 30mm).