

Reasoning and Problem Solving

Step 3: Area of a Triangle 1

National Curriculum Objectives:

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

Differentiation:

Questions 1, 4 and 7 (Problem Solving)

Developing Create a question about the area of two different triangles where the squares measure 1cm^2 and part squares are always worth a half.

Expected Create three questions about the area of three different triangles where the squares measure 1cm^2 .

Greater Depth Create three questions about the area of three different triangles they have drawn where the squares measure 2cm^2 or 3cm^2 .

Questions 2, 5 and 8 (Reasoning)

Developing Find, correct and explain the mistakes made calculating the area of two different triangles where the squares measure 1cm^2 and part squares are always worth a half.

Expected Find, correct and explain the mistakes made calculating the area of three different triangles where the squares measure 1cm^2 .

Greater Depth Find, correct and explain the mistakes made calculating the area of three different triangles where the squares measure 2cm^2 or 3cm^2 .

Questions 3, 6 and 9 (Problem Solving)

Developing Draw a right-angled triangle on squared paper where the squares measure 1cm^2 with a small, specified area of 6cm^2 or less.

Expected Draw triangles on squared paper where the squares measure 1cm^2 with a specified area.

Greater Depth Draw triangles on squared paper where the squares represent 2cm^2 or 3cm^2 with a specified area and one specified length.

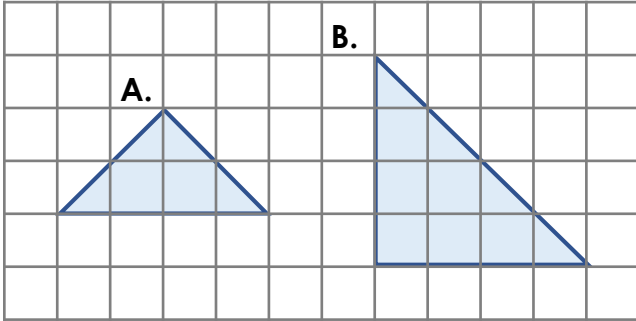
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Area of a Triangle 1

Area of a Triangle 1

1a. Here are two triangles. Each square equals 1cm^2 .

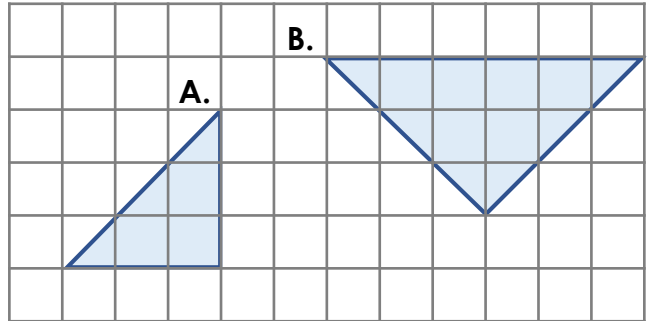


Create a question about the area of the triangles. Remember to include the answer.



PS

1b. Here are two triangles. Each square equals 1cm^2 .

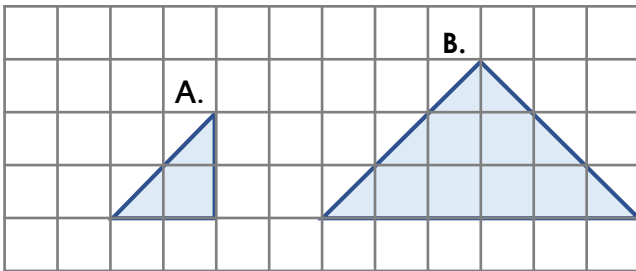


Create a question about the area of the triangles. Remember to include the answer.



PS

2a. Ben has worked out the area of these triangles, however he's got them both wrong!



Area = 1cm^2

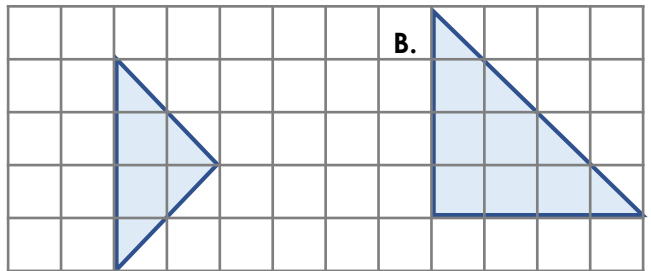
Area = 6cm^2

Correct and explain his mistakes.



R

2b. Sadia has worked out the area of these triangles, however she's got them both wrong!



Area = 8cm^2

Area = 12cm^2

Correct and explain her mistakes.



R

3a. Kelly is drawing a right-angled triangle.

She says,



My triangle has an area of 4cm^2 .

Use squared paper to draw a triangle with the same area as Kelly's.



PS

3b. Harry is drawing a right-angled triangle.

He says,



My triangle has an area of 6cm^2 .

Use squared paper to draw a triangle with the same area as Harry's.

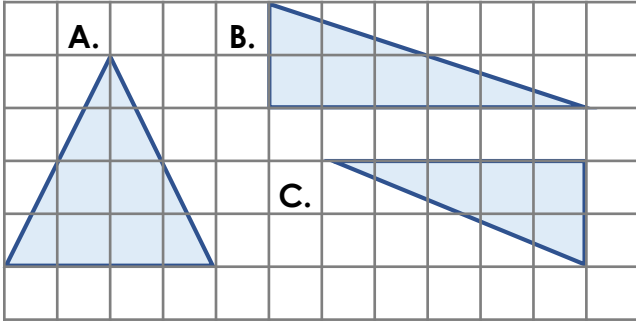


PS

Area of a Triangle 1

Area of a Triangle 1

4a. Here are three triangles. Each square equals 1cm^2 .

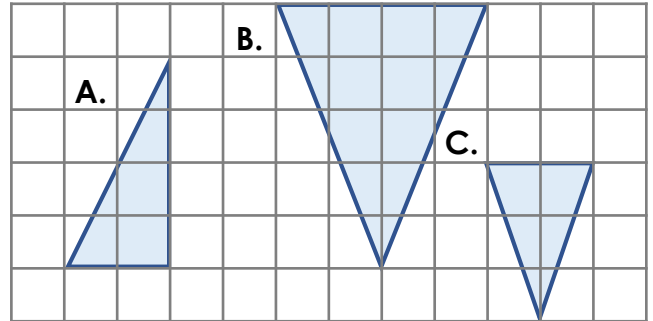


Create three questions about the area of the triangles. Remember to include answers.



PS

4b. Here are three triangles. Each square equals 1cm^2 .

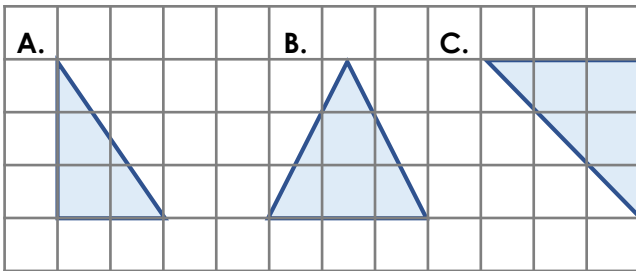


Create three questions about the area of the triangles. Remember to include answers.



PS

5a. Jude has worked out the area of these triangles, however he's got them all wrong!



Area = 2cm^2

Area = 3cm^2

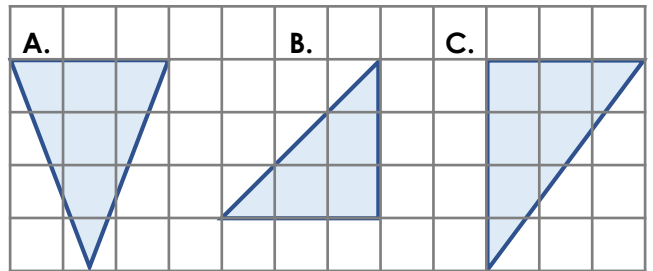
Area = 4cm^2

Correct and explain his mistakes.



R

5b. Ellie has worked out the area of these triangles, however she's got them all wrong!



Area = 12cm^2

Area = 9cm^2

Area = 12cm^2

Correct and explain her mistakes.



R

6a. Adela is drawing a triangle.

She says,



My triangle has an area of 12cm^2 .

Use squared paper to draw triangles with the same area as Adela's.



PS

6b. Imran is drawing a triangle.

He says,



My triangle has an area of 16cm^2 .

Use squared paper to draw triangles with the same area as Imran's.



PS

Area of a Triangle 1

Area of a Triangle 1

7a. Use squared paper to draw 3 triangles which each have a different area.

Imagine each square is worth 2cm^2 .

Create three questions about the area of the triangles.

Remember to include answers.



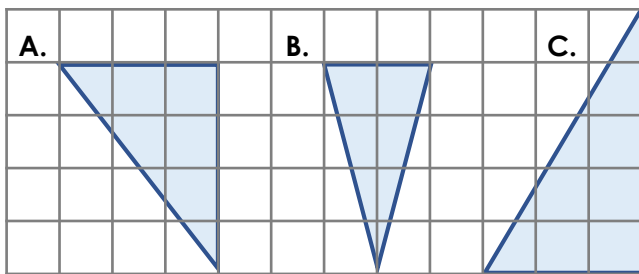
PS



PS

8a. Ali has worked out the area of these triangles, however he's got them all wrong!

1 square = 3cm^2



A. Area = 6cm^2

B. Area = 4cm^2

C. Area = 7.5cm^2

Correct and explain his mistakes.



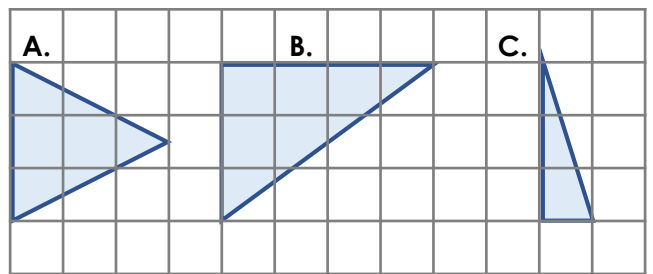
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R

8b. Lily has worked out the area of these triangles, however she's got them all wrong!

1 square = 2cm^2



A. Area = 13.5cm^2

B. Area = 18cm^2

C. Area = 4.5cm^2

Correct and explain her mistakes.



R

9a. Bella is drawing a triangle.

She says,



My triangle has an area of 18cm^2 . One of its sides is 12cm long.

Use squared paper to draw triangles with the same properties as Bella's. Imagine each square is worth 2cm^2 .



PS

9b. Alfie is drawing a triangle.

He says,



My triangle has an area of 30cm^2 . One of its sides is 15cm long.

Use squared paper to draw triangles with the same properties as Alfie's. Imagine each square is worth 3cm^2 .



PS

Reasoning and Problem Solving Area of a Triangle 1

Developing

- 1a. Various possible answers, for example: Which triangle has the smallest area? (A)
2a. Ben has only counted the full squares to work out the area and has not added the half squares. The correct answers are: $A = 2\text{cm}^2$, $B = 9\text{cm}^2$.
3a. Various possible answers. Accept any triangle drawn with an accurate area of 4cm^2 .

Expected

- 4a. Various possible answers, for example: Which has the largest area? (A) Order the triangles from smallest to biggest. (C, B, A) What's the same, what's different? (B and C are right-angled triangles, A is an isosceles triangle)
5a. Jude has incorrectly counted the part squares. The correct answers are: $A = 3\text{cm}^2$, $B = 4.5\text{cm}^2$, $C = 4.5\text{cm}^2$.
6a. Various possible answers. Accept any triangle or triangles drawn with an accurate area of 12cm^2 .

Greater Depth

- 7a. Various possible answers. All drawn triangles must have a different area. Check questions and answers for accuracy.
8a. Ali has not multiplied the total squares by 3. They need to be multiplied because each square is worth 3cm^2 . The correct answers are: $A = 18\text{cm}^2$, $B = 12\text{cm}^2$, $C = 22.5\text{cm}^2$.
9a. Various possible answers. Accept any triangle or triangles drawn with at least one side which is 12cm long and an accurate area of 12cm^2 where each square represents 2cm^2 .

Reasoning and Problem Solving Area of a Triangle 1

Developing

- 1b. Various possible answers, for example: What is the difference between the area of the triangles? (4.5cm^2)
2b. Sadia has added the lengths of the sides instead of calculating the area. The correct answers are: $A = 4\text{cm}^2$, $B = 8\text{cm}^2$.
3b. Various possible answers. Accept any triangle drawn with an accurate area of 6cm^2 .

Expected

- 4b. Various possible answers, for example: Which triangle has an area of 3cm^2 ? (C) How much bigger is the area of B than A? (6cm^2) What is the total area of the triangles? (17cm^2)
5b. Ellie has calculated the area of the rectangles but has not halved it to get the area of the triangles. The correct answers are: $A = 6\text{cm}^2$, $B = 4.5\text{cm}^2$, $C = 6\text{cm}^2$.
6b. Various possible answers. Accept any triangle or triangles drawn with an accurate area of 16cm^2 .

Greater Depth

- 7b. Various possible answers. Two of the drawn triangles must have the same area. Check questions and answers for accuracy.
8b. Lily has multiplied the total squares by 3 but they need to be multiplied by 2 because each square is worth 2cm^2 . The correct answers are: $A = 9\text{cm}^2$, $B = 12\text{cm}^2$, $C = 3\text{cm}^2$.
9b. Various possible answers. Accept any triangle or triangles drawn with at least one side which is 15cm long and an accurate area of 30cm^2 where each square represents 3cm^2 .