1. a) Find the area of the shaded pattern block word.

b) There are 48 squares in the grid. How can you use your answer above to find the number of unshaded squares (without counting them)?

2. Ed bakes a rectangular birthday cake for his Dad.
The cake will be cut into twenty-four 5 x 5 cm pieces.
a) What is the area of the cake?
b) The width of the cake is 20 cm. What is its length?
c) Ed puts blackberries on the perimeter of the cake, 2 blackberries on each 5 cm. How many berries does he need?
d) Blackberries are sold in packs of 20 berries. Each pack costs $2.99. If Ed pays for the blackberries with a 10-dollar bill, how much change does he get?

3. A rectangle's length and width are both whole numbers, where the length is greater than the width. Find possible sizes for the rectangle, given the areas below.

<table>
<thead>
<tr>
<th>Area  = 8 cm²</th>
<th>Area  = 14 cm²</th>
<th>Area  = 18 cm²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length</td>
<td>Length</td>
<td>Length</td>
</tr>
<tr>
<td>Width</td>
<td>Width</td>
<td>Width</td>
</tr>
</tbody>
</table>

4. Name something you would measure in ...

a) square metres ______________________

b) square kilometres ______________________

BONUS

5. Find the area of the shaded part. Then, say what fraction of the grid is shaded.

HINT: How can you use the area of the unshaded part and the area of the grid?

a) Area:

Fraction:

b) Area:

Fraction:

c) Area:

Fraction:
There are 100 cm² in 1 dm².

a) How many cm² are in 1 m²?

b) Change 1.34 m² to cm².

The new units are ________ times ________ So I need ________ times ________ units.

So I ________ by ________ So 1.34 m² = ________ cm².

c) 14.65 m² = ________ cm²
d) 0.01 m² = ________ cm²
e) 0.376 m² = ________ cm²
f) 7.2 m² = ________ cm²

2. (i) Find the ratios of the perimeter of each square to the length of its side.

   a) ____________________
   b) ____________________
   c) ____________________
   d) ____________________

   (ii) What do you notice?

3. In each rectangle the long side is twice as long as the short side. Find the ratio of the perimeter of each rectangle to the length of the short side.

   a) ____________________
   b) ____________________
   c) ____________________
   d) ____________________

4. Patti says, “100 cm = 1 m, so 100 cm² = 1 m².” Explain why this is wrong.
1. The rectangle was made by moving the shaded triangle from one end of the parallelogram to the other.

   ![Parallelogram and rectangle diagram]

   Base = 4
   Height = 5
   Width = __
   Length = __

   a) Is the area of the rectangle the same as the area of the parallelogram? ________________
      How do you know? ___________________________________________________________________

   b) Fill in the width of the rectangle.
      What do you notice about the base of the parallelogram and the width of the rectangle?
      __________________________________________________________________

   c) Fill in the length of the rectangle.
      What do you notice about the height of the parallelogram and the length of the rectangle?
      __________________________________________________________________

   d) Recall that, for a rectangle: Area = length \times width.
      Can you write a formula for the area of a parallelogram using the base and height?

2. Measure the height of the parallelograms using a protractor and a ruler.
   Measure the base using a ruler.
   Find the area of the parallelogram using your formula from Question 1 d) above.

   ![Parallelogram diagrams]

   a) Base = 5 cm  
      Height = 7 cm
   b) Base = 4 cm  
      Height = 3 cm
   c) Base = 8 cm  
      Height = 6 cm
   d) Base = 3.7 cm
      Height = 6 cm

3. Find the area of the following parallelograms.

   a) Base = 5 cm  
      Height = 7 cm
   b) Base = 4 cm  
      Height = 3 cm
   c) Base = 8 cm  
      Height = 6 cm
   d) Base = 3.7 cm  
      Height = 6 cm
ME6-31: Area of Triangles

1. a) Draw a dotted line to show the height of the triangle.
   Then find the length of the height and the base of the triangles (in cm).
   The first has been done for you.

   ![Triangle Diagram with Height Marked]

   b) Find the area of each triangle above by dividing it into two right angle triangles.

   
   
   | Area of A: _______ | Area of B: _______ |
   | Area of C: _______ | Area of D: _______ |

   ![Area Formulas Diagram]

   REMEMBER:
   \[
   \text{Area of Triangle} = \frac{\text{Area of Rectangle}}{2}
   \]

2. Parallelogram B was made by joining two copies of Triangle A together.
   How can you find the area of Triangle A?
   HINT: Use what you know about the area of parallelograms.

   ![Parallelogram Diagram]

   

3. Find the area of the triangle by joining two copies of the triangle together to form a parallelogram as in Question 2.

   ![Triangle and Parallelogram Diagram]

4. Write a formula for the area of a triangle using the base and the height of the triangle.
   HINT: How are the areas of the triangles in Questions 2 and 3 related to the areas of the parallelograms?

5. Show how you would calculate the area of Triangle A in Question 1 using your formula.
1. On the previous page, you discovered the formula:

\[
\text{Area of Triangle} = (\text{base} \times \text{height}) \div 2
\]

Find the area of a triangle with the dimensions.

a) Base = 6 cm  b) Base = 4 cm  c) Base = 6 cm  d) Base = 3.2 cm
   Height = 2 cm  Height = 3 cm  Height = 4 cm  Height = 8 cm
   Area =     Area =     Area =     Area =

2. Previously, you discovered the formula:

\[
\text{Area of a Parallelogram} = \text{base} \times \text{height}
\]

Find the area of a parallelogram with the dimensions.

a) Base = 5 cm  b) Base = 10 cm  c) Base = 3.5 cm  d) Base = 2.75 cm
   Height = 7 cm  Height = 17 cm  Height = 9 cm  Height = 8 cm
   Area =     Area =     Area =     Area =

3. Measure the base and height of the triangle using a ruler. Then find the area of the triangle.

a)  

b)  

c)  

4. Find the area of each shape by subdividing it into triangles and rectangles.

5. Draw a line to cut the figure into two rectangles. Calculate the area of the two rectangles and add the areas to get the area of the figure.
Find the measurements of the sides that are not labelled. Then calculate the perimeter and area of each figure.
CAREFUL: Not all sides have been provided with measurements.

a) Perimeter: _____  b) Perimeter: _____
Area: _____  Area: _____

7.

a) Two polygons are similar if they are the same shape. Draw a shape similar to the original, making each base two times as long. How high should you make the new shape?

b) Find the area (in square units) of each original shape. Then find the area of each new shape.

Area of A: _____  Area of B: _____  Area of C: _____  Area of D: _____
Area of the new shape: _____  Area of the new shape: _____  Area of the new shape: _____  Area of the new shape: _____

c) When the base and the height of a shape are doubled, what happens to the area of the shape?

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8. A square has area 25 cm². What length is each side? What is its perimeter?

9. A rectangle has area 12 cm² and length 6 cm. What is its width? What is its perimeter?

10. A parallelogram has base 10 cm and area 60 cm². How high is the parallelogram?

11. Draw a rectangle on grid paper. Draw a second rectangle with sides that are twice as long. Is the perimeter of the larger rectangle 2 times or 4 times the perimeter of the smaller rectangle?

12. On grid paper, draw two different rectangles. Make the one with the smaller area have the greater perimeter.

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Measurement 2
13. Each square on the grid represents an area of 25 cm$^2$. What is the area of each figure? How do you know?

14. Each edge on the grid represents 0.5 cm. Is the perimeter of the rectangle greater than or less than 14.5 cm? How do you know?

15. The picture shows plans for two parks. What is the perimeter of each park?

16. What fraction of the area of the rectangle is the triangle? How do you know?

17. What fraction of the area of the parallelogram is the area of the triangle? How do you know?

18. The area of the shaded triangle is 8 m$^2$. What is the perimeter of the square? How do you know?

19. The area of a triangle is 20 cm$^2$, and its base is 10 cm. What is the height of the triangle? How can you check your answer?

20. Alex is doing a science project on swimming pools. What could he measure using ...
   a) metres (m)? b) metres squared (m$^2$)? c) metres cubed (m$^3$)?
   d) kilograms (kg)? e) litres (L)? f) kilometres per hour (km/h)?