|  |  |
| --- | --- |
| **GRADE 7** | **MARK ALLOCATION:** 50 |
| **FORM OF ASSESSMENT:** Investigation | **CONCEPT/TOPIC:** Area and Perimeter of 2D shapes, Surface area of 3D objects |
| **DATE: .............................** | **TIME ALLOCATION:** 60 minutes |

**INFORMATION AND INSTRUCTIONS:**

|  |  |  |
| --- | --- | --- |
| 1. This invesigation consist of **Section A and Section B** activities. Answer BOTH sections. 2. Clearly show ALL calculations, diagrams, graphs, et cetera that you have used in determining your answers. |  |  |

1. Approved calculator may be used.
2. If necessary, answers should be rounded off to TWO decimal places, unless stated otherwise.
3. Number the answers EXACTLY according to the numbering system used in this question paper.
4. Write neatly and legible.

**SECTION A**

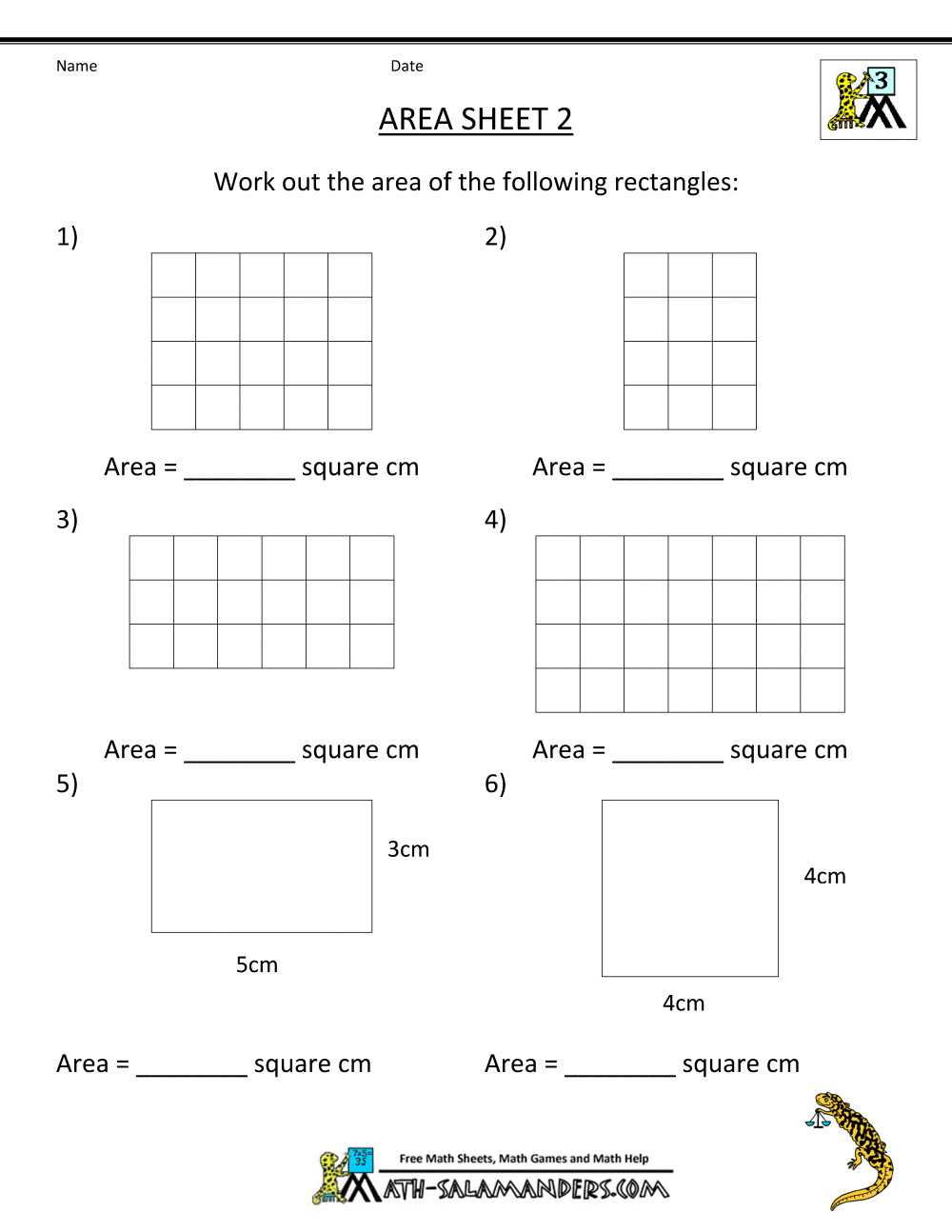
**ACTIVITY 1**

**Area is the amount of 2D space occupied by a shape or the size of the flat surface surrounded by the border of the shape.** Area (*A*) is measured in squared units, such as

**Perimeter of a shape is the total distance around the shape or the lengths of its sides added together, the boundary**. Perimeter (*P*) is measured in units such as

* 1. Each of the following figures is divided into squares of equal size, namely. Give the perimeter and area of each figure.

1.1.1

 (2)

**Side**

Perimeter

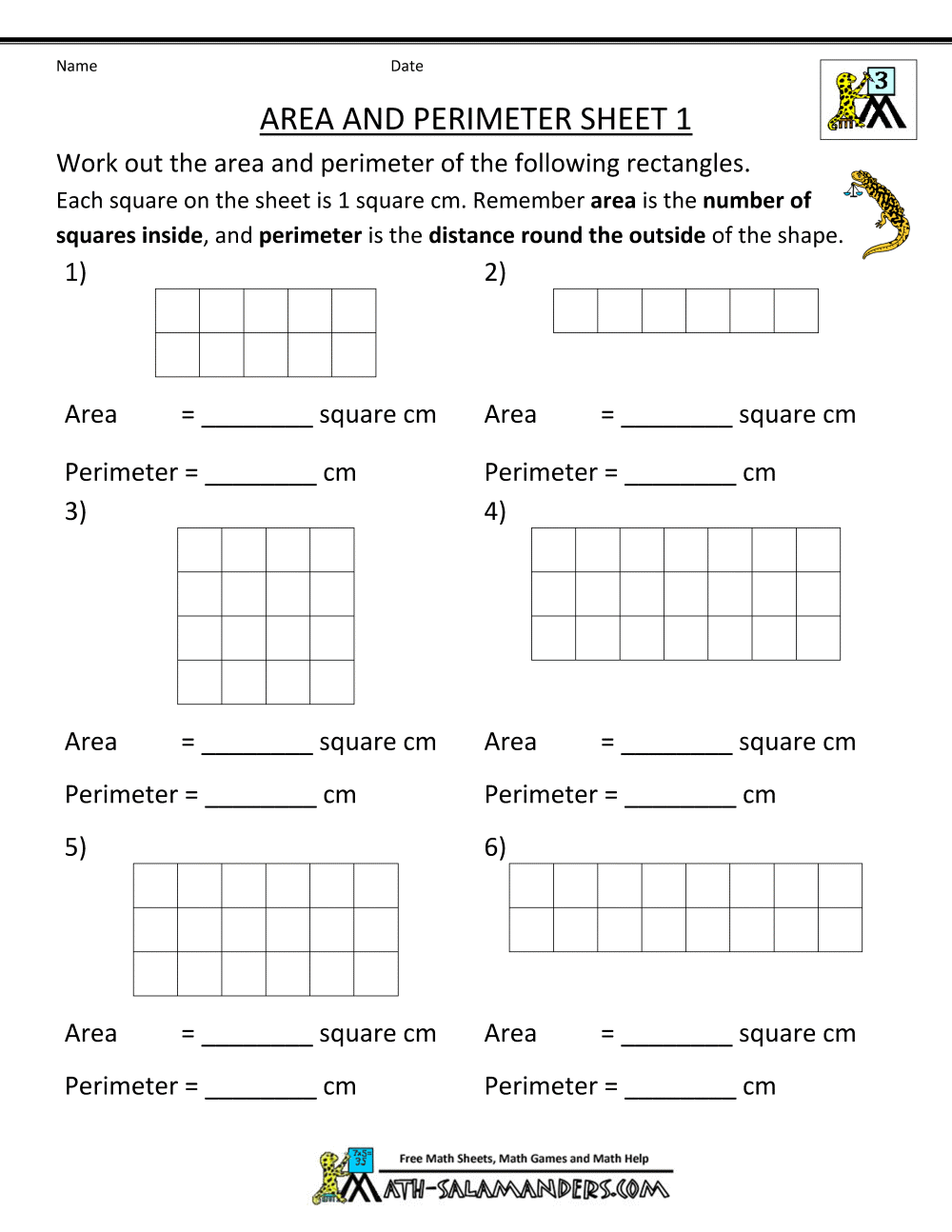
Area

1.1.2

**Side**

Perimeter

Area

 (2)

* 1. What kind of quadrilateral is in 1.1?

................................................................................................................................ (1)

1.3 If the figures in 1.1 were not divided into squares explain how you would calculate the perimeter and area of the shape. (HINT: use the sides of the shape to help you)

.............................................................................................................................

............................................................................................................................. (2)

1.4 Use the rule or formula deduced in 1.3 to calculate the perimeter and area of the following figures:

1.4.1 1.4.2

9 *cm*

6 *cm*

1.4.1 Perimeter 1.4.2 Perimeter

.............................................. .................................................

.............................................. .................................................

..............................................(2) ................................................. (2)

Area Area

................................................ ...................................................

................................................ ....................................................

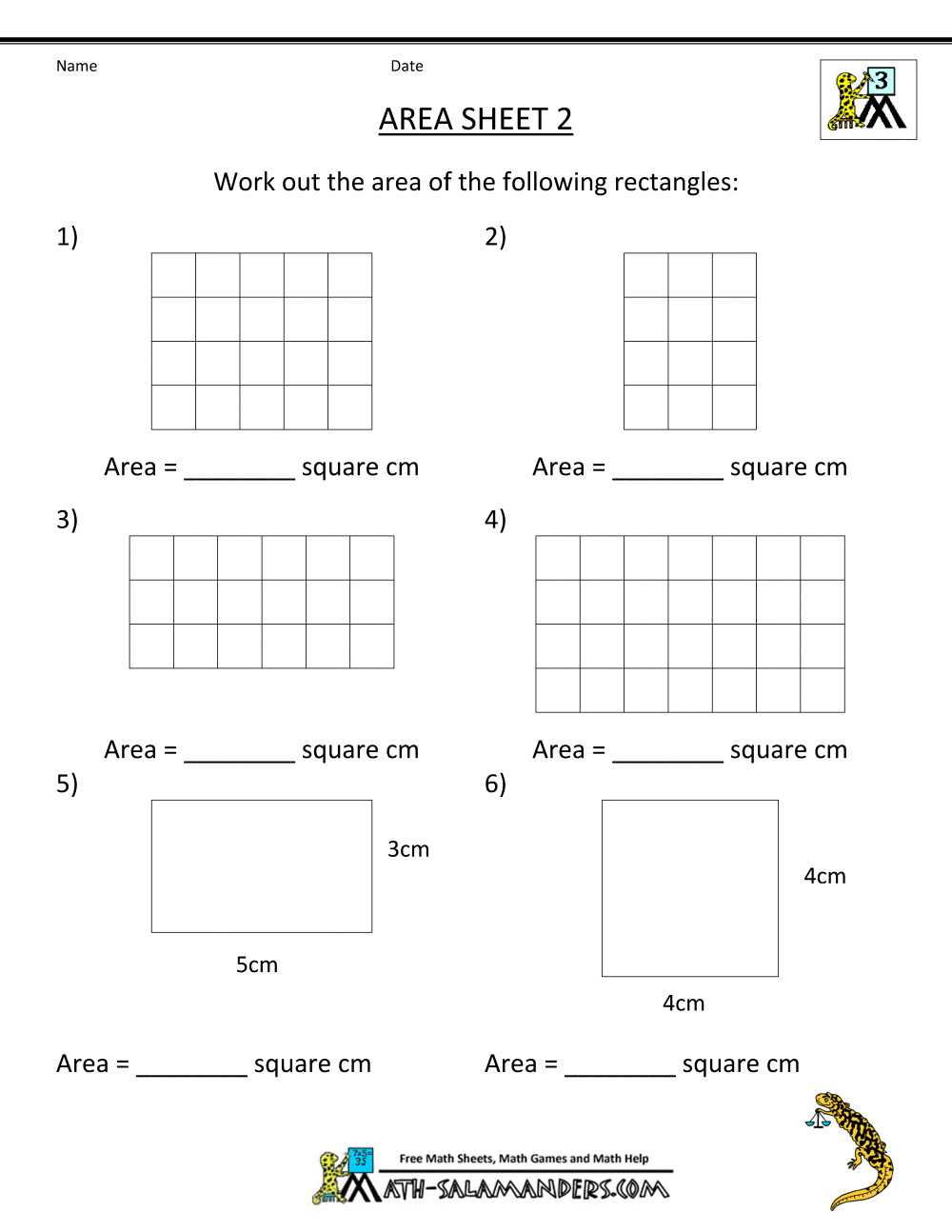
...............................................(2) ....................................................(2)

**[15]**

**ACTIVITY 2**

2.1 The following figures are divided into squares of equal size, namely. Write down the perimeter and area of each figure.

2.1.1



**Length**

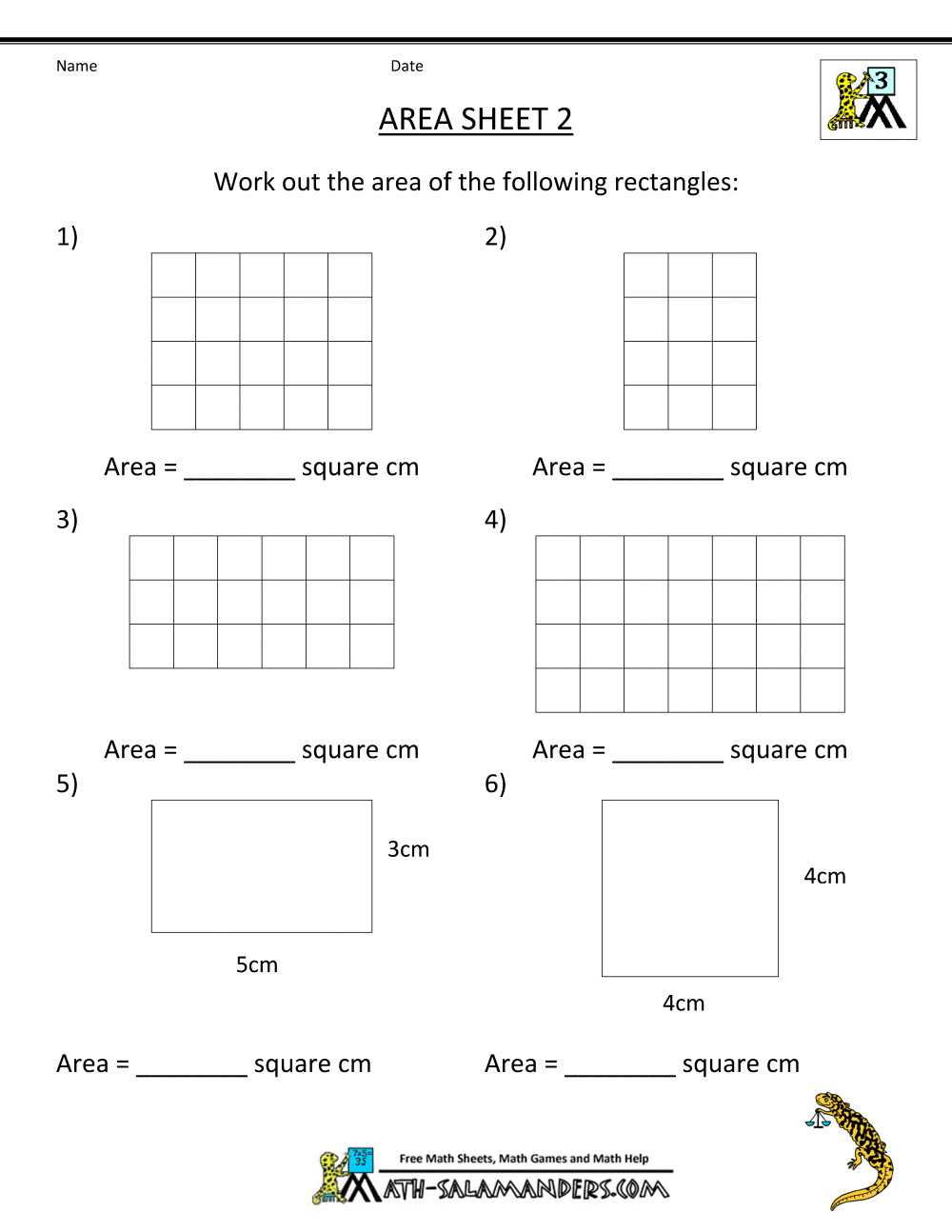
**Breadth**

Perimeter

Area

(2)

2.1.2

 (2)

**Length**

**Breadth**

Perimeter

Area

2.2 Give the name of the quadrilateral in 2.1?

................................................................................................................. (1)

2.3 If the figures in 2.1 were not divided into squares explain how you would calculate the perimeter and area of the shape. (HINT: use the sides [length and breadth] of the shape to help you)

...............................................................................................................................

............................................................................................................................. (2)

2.4 Use the rule or formula deduced in 2.3 to calculate:

2.4.1 the perimeter



Perimeter

.................................................................................

...................................................................................

...................................................................................

.................................................................... (3)

2.4.2 the area



Area

........................................................

.......................................................

..................................................... (3)

**[13]**

**ACTIVITY 3**

3.1 Work out the area of the following.

3.1.1 A rectangle measuring. Area

3.1.4 A square with sides of. Area

(2)

3.2 Calculate the:

3.2.1 perimeter

3.2.2 area of the following figure.

10 *cm*

4 *cm*

3 *cm*

5 *cm*

7 *cm*

3.2.1

.......................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................... (2)

3.2.2

.......................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................... (4)

**[8]**

**SECTION B**

**ACTIVITY 4**

**Surface area of an object is the sum of the areas of all its faces.**

In this activity we will focus on the surface area of rectangular prisms.

Bring a porridge box or any other rectangular shaped box and unfold it to make a net

Follow the following instructions carefully

* + 1. Colour any of the rectangles in the net that have the same areas, the same colour.
    2. Calculate the areas of all the rectangles in the net. What do you notice?

........................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................

* + 1. Write down the surface area of your rectangular box.

........................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................

* + 1. Is there a shorter way of calculating the surface area, other than adding all the areas of the six faces?
    2. Write down a formula for the Surface Area of a rectangular prism with length (, breath () and height (). Compare and discuss your formulae.

................................................................................................................................. (2)

4.2 Use the formula deduced in 4.1.5 to calculate the surface area of the following rectangular prism. It has a length of, a breadth of and a height of .

............................................................................................................................................................................................................................................................................................................................................................................................................. (3)

4.3 The following two boxes are rectangular prisms. The boxes must be painted.

100 *cm*

20 *cm*

50 *cm*

Box A

0, 6 *m*

2 *m*

1, 2 *m*

Box B

4.3.1 Calculate the total surface area of box A and of box B.

........................................................ ..........................................................

....................................................... ...........................................................

...................................................... ...........................................................

..................................................(3) ......................................................(3)

4.3.2 What will it cost to paint both boxes if the paint costs ?

.................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................. (3)

**[14]**