Appendix B

Example Mathematics Items
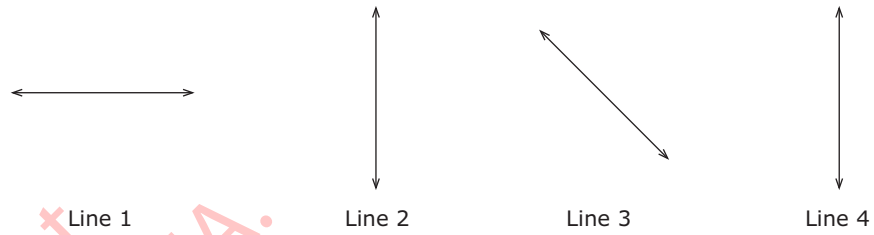
Grade 4 and Grade 8
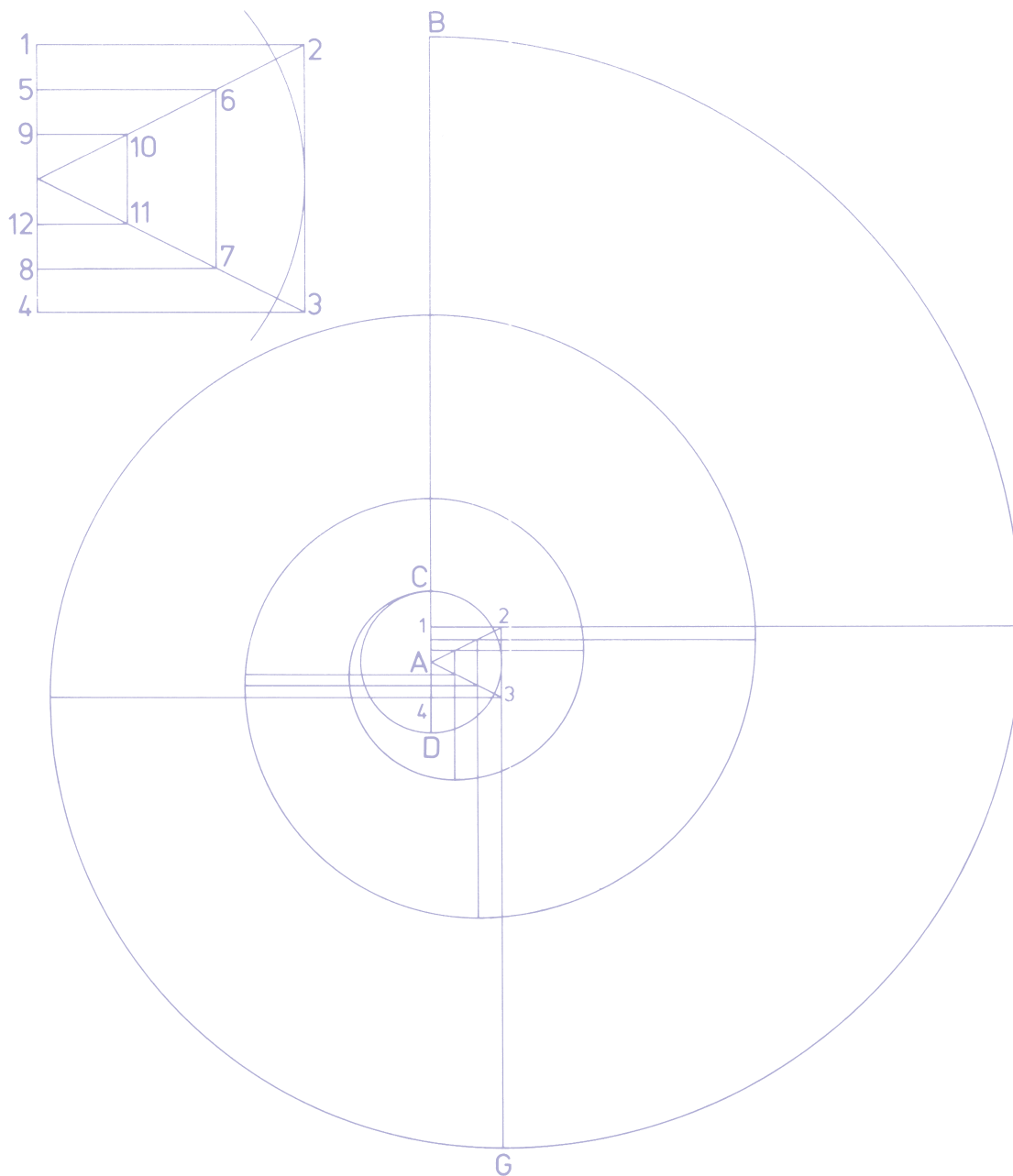
Example Mathematics Items: Grade 4

1

Line 1   Line 2   Line 3   Line 4

Which two of these lines are parallel?

- (A) 1 and 2
- (B) 1 and 3
- (C) 2 and 3
- *(D) 2 and 4

2

Brad thought of a number. He then multiplied it by 2 and added 4. The answer Brad obtained was 16. What was the number he first thought of?
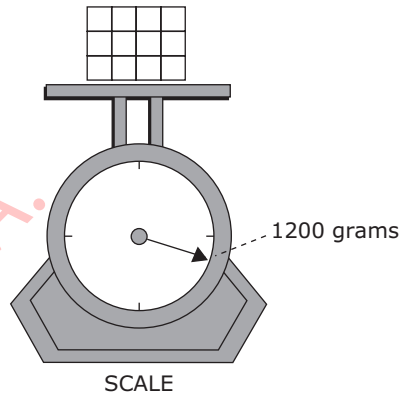
Answer: _____6_____

*Correct Answer

3

1200 grams

SCALE

Ana placed 12 identical blocks on the scale as shown in the figure. How many blocks should be removed to reduce the weight to 1000 grams?
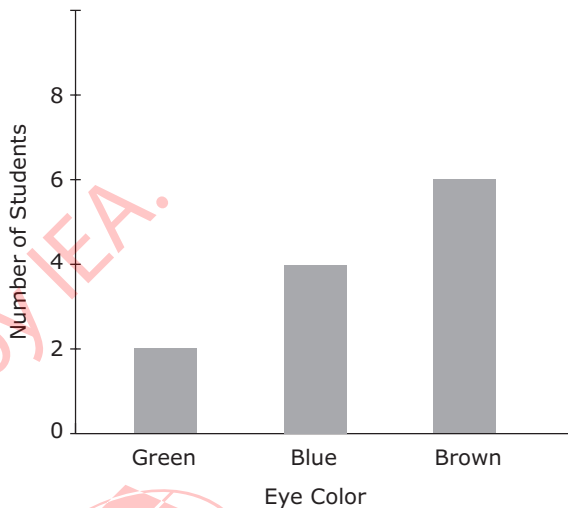
(A) 1

* (B) 2

(C) 3

(D) 4

4

0   1   2

On the number line, which of these numbers would be closest to 1?

(A) 0.1

* (B) 0.9

(C) 1.2

(D) 1.9

*Correct Answer

5

Student's Eye Color

The chart above shows the eye color of all students in Ms. Hagan's choir.

A. How many students are in Ms. Hagan's choir?

Answer: ____12____

$$2 + 4 + 6 = 12$$

B. What fraction of Ms. Hagan's choir has blue eyes?

Answer: ____$\frac{1}{3}$____

$$\frac{4}{12} = \frac{1}{3}$$

Map

Instructions: Questions **6** and **7** are about using a map.

For these questions, you have been given a cardboard ruler.
If you do not have the cardboard ruler raise your hand.

```
0   1   2   3   4   5   6   7   8   9   10
```

Use the map below and your ruler to answer this set of questions.

Emory

Smithville

Marytown

Rosetown

Brown

Easton

Mott

4 km
1 cm

Scale: 1 cm represents 4 km
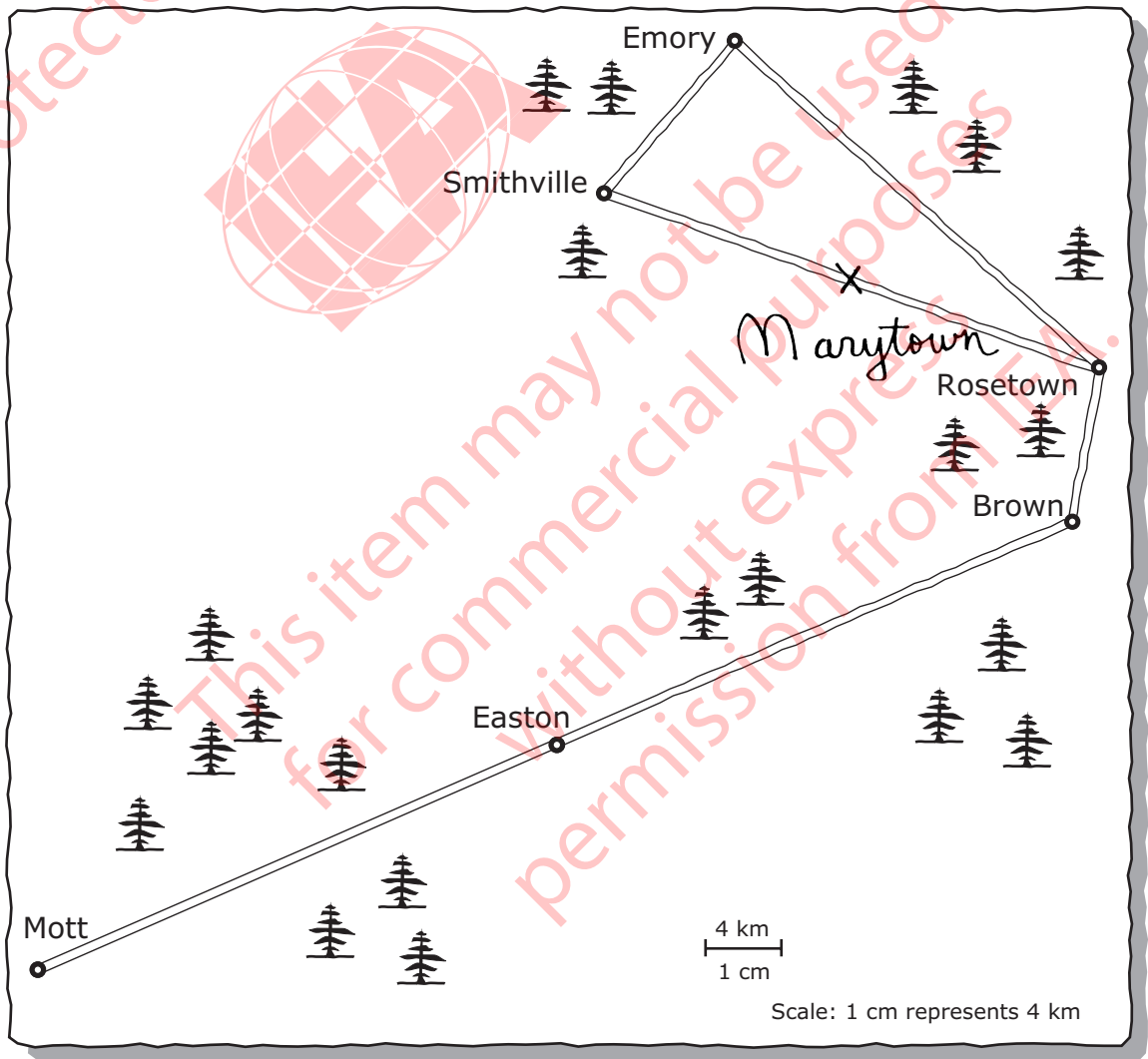
Questions for Map begin on the next page.

6 **Traveling Between Towns**

A. How many centimeters is it between Mott and Brown on the map?

Answer: _____15._____centimeters (cm)

B. How many kilometers is it between Mott and Brown on the road?

Answer: _____60_____kilometers (km)

C. It takes one hour to drive from Mott through Easton to Brown. At the same speed, how much time would it take to travel from Mott to Easton?

Answer: ___30 minutes___

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7 **Distances From Rosetown**

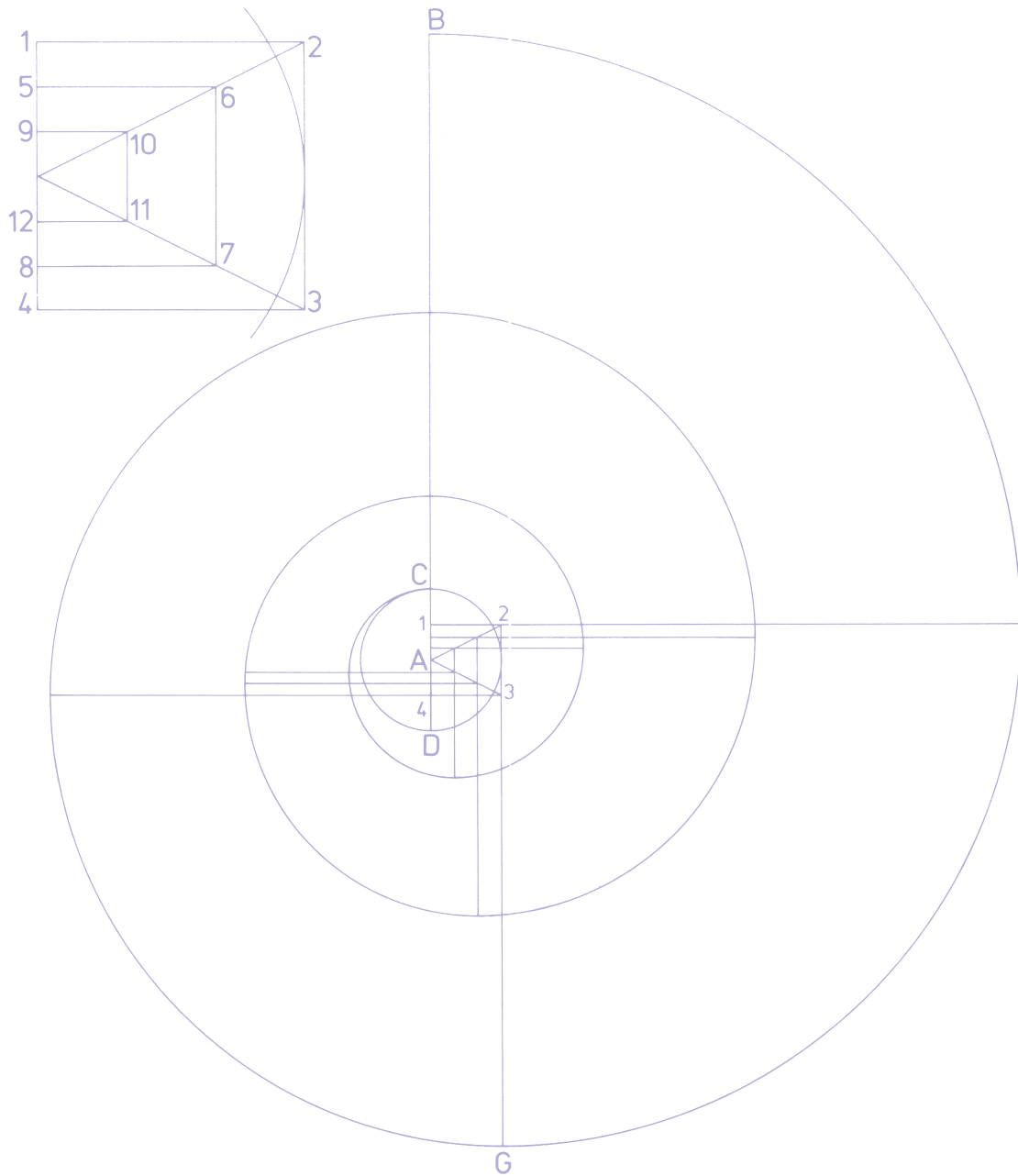A. Is Emory or Smithville closer to Rosetown?

Answer: ___Emory___

B. How many centimeters closer is it on the map?

Answer: _____0.5_____centimeters (cm)

C. Another town called Marytown is the same distance from Rosetown as it is from Smithville. Show **on the map** where Marytown might be located. Mark it with an **X** and write Marytown below it.
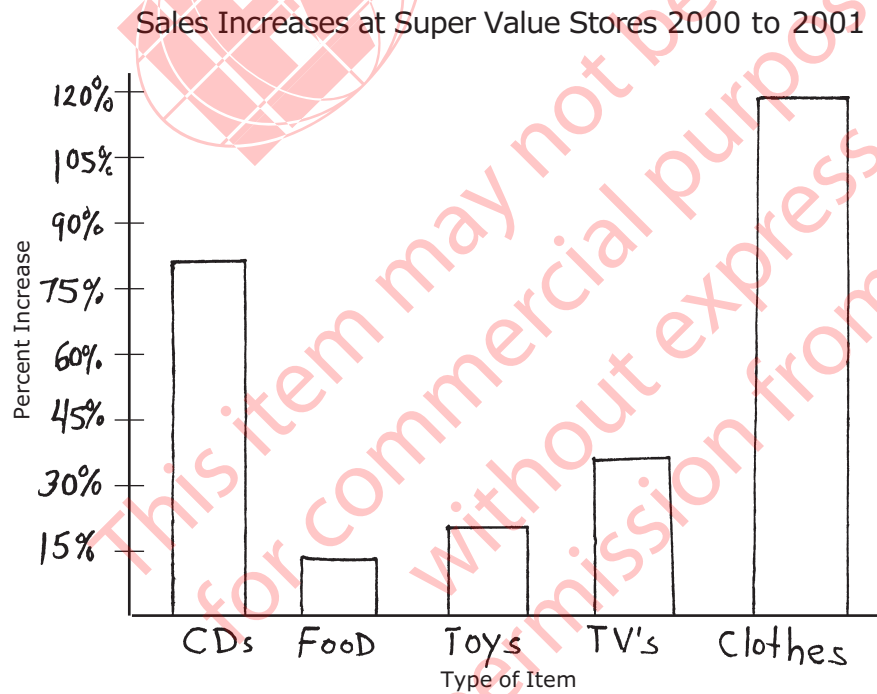
End of Map section. ●

Example Mathematics Items: Grade 8

1

Sales Increases at Super Value Stores 2000 to 2001	
Type of Item	**Percent Increase**
CDs	80%
Food	15%
Toys	25%
TVs	40%
Clothes	120%

Use the data in the table above to construct a bar graph using the axis below. Indicate the scale for the percent increase and label each bar.

Sales Increases at Super Value Stores 2000 to 2001

2
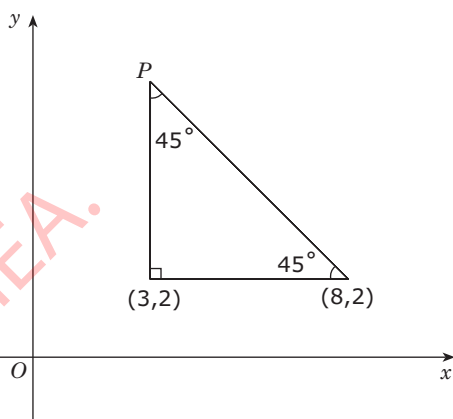
In the coordinate plane above, what are the coordinates of vertex P?

Ⓐ (2,7)

Ⓑ (2,8)

*Ⓒ (3,7)

Ⓓ (3,8)

*Correct Answer

3

Row	Terms	Sum
Row 1	1	1
Row 2	1 + 3	4
Row 3	1 + 3 + 5	9
Row 4	1 + 3 + 5 + 7	16
⋮		
Row 7	1 + 3 + 5 + 7 + 9 + 11 + 13	49
⋮		

A. Enter the terms and sum for Row 7 in the table.

B. Without writing out all the terms, what is the sum for Row 20?

Answer: _____400_____

C. What is the value of the sum for Row n?

Answer: _____$n \times n$_____

4 If $\sqrt{81} < n < \sqrt{144}$, then n could be which of the following numbers?

   Ⓐ   9

*Ⓑ   11

   Ⓒ   12

   Ⓓ   13

5 Write an equation to represent the following sentence.

"When half of x is added to 10, the result is 24."
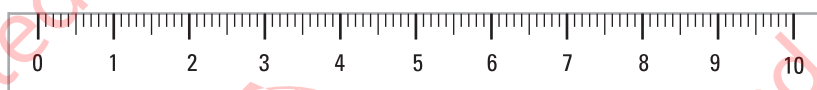
Answer: $\frac{1}{2}x + 10 = 24$

*Correct Answer

Birdhouse

Instructions: Questions **6** and **7** are about building a bird house. To answer these questions you may refer to any information shown on the pages in the Birdhouse section.

For these questions you have been given a cardboard ruler.
If you do not have the cardboard ruler raise your hand.

As a class project, students in Ms. Grant's eighth grade class are making small birdhouses out of wood. Chris receives a paper pattern to build a small birdhouse that looks like the one shown below.

right roof panel

right side wall panel
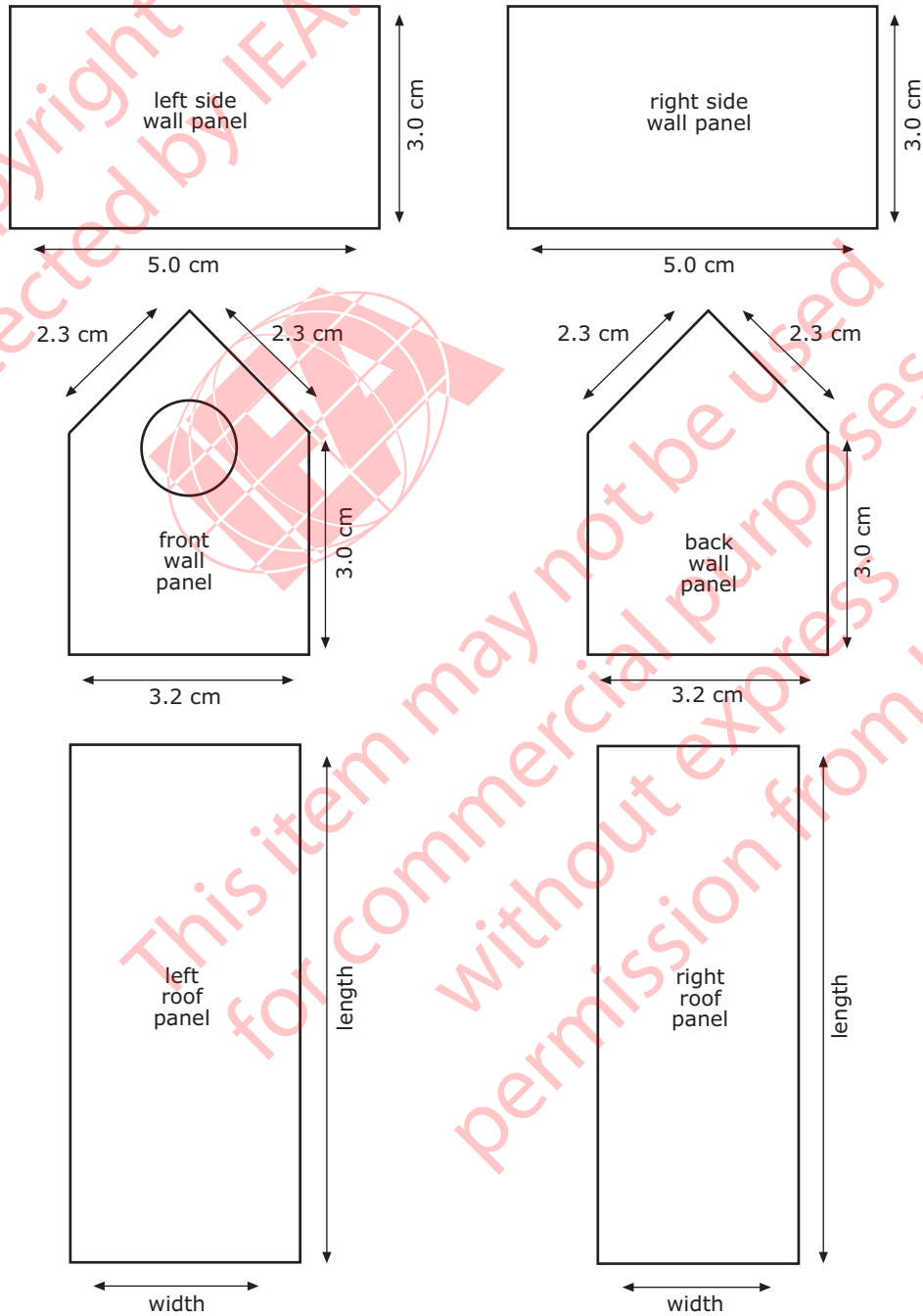
front wall panel
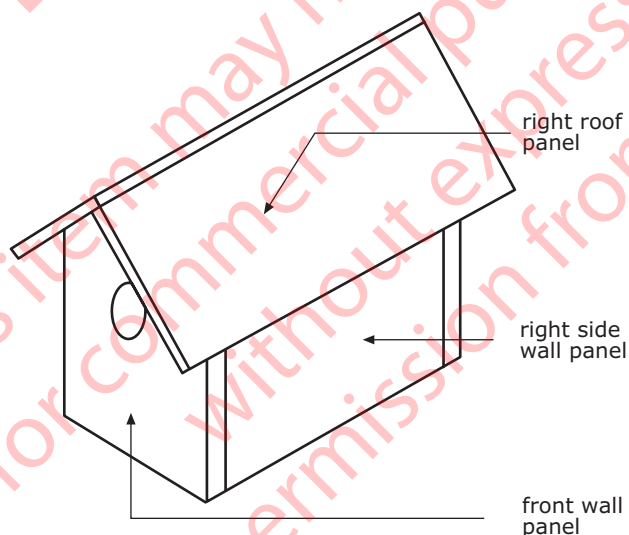
picture not to scale

Questions for Birdhouse begin on the next page.

6

Chris has the pattern for 6 pieces: 4 wall pieces and 2 roof pieces. The sheet with the pattern for the floor is lost. Chris' pattern pieces are shown in Figure 1 below. The directions state that 1 centimeter in the pattern represents 3 centimeters for the actual birdhouse.

Figure 1

This Birdhouse question continues on the next page. ➡

A. Figure 1 shows the dimensions of the pattern pieces for the four wall panels. Use your ruler to measure the dimensions of the pattern pieces for the two roof panels, to the closest millimeter.

What is the length and width of the pattern for the **left** roof panel?

The length of the left roof panel is __7.0__ cm.

The width of the left roof panel is __3.1__ cm.

What is the length and width of the pattern for the **right** roof panel?

The length of the right roof panel is __7.0__ cm.

The width of the right roof panel is __2.7__ cm.

B. What needs to be done to the measurements in the pattern to find the measurements in centimeters for the actual birdhouse?

Answer: __times all the measurements by 3__

C. What will be the actual measurements of the left side wall panel of the birdhouse?

Answer: __15 cm x 9 cm__

D. Since some of the pattern pieces in Figure 1 are exactly the same in size and shape, Chris does not need to find the actual measurements for every piece.

What is the **least** number of the 6 pattern pieces Chris needs to find the actual measurements for the birdhouse?
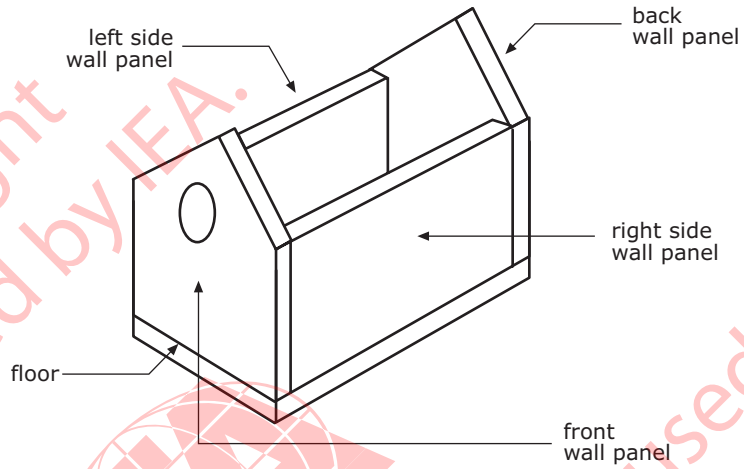
Answer: __4__

7

Figure 2 below shows how the birdhouse should look when the front panel, back panel, side panels, and floor are assembled using glue and nails.

Figure 2

left side
wall panel

back
wall panel

right side
wall panel

floor

front
wall panel

picture not to scale

Since the pattern for the floor piece is lost, Chris must use this figure to determine the measurements for the floor. To do this, Chris needs to know the thickness of the wood used to build the birdhouse.

The thickness of the wood is 1.2 cm.

A. What is the length (longer side) and width (shorter side) of the piece of wood Chris would need for the birdhouse floor?

Length: ____17.4____ cm

Width: ____9.6____ cm

This Birdhouse question continues on the next page. ▶

B. In the space below make a drawing of the actual size of the floor of the birdhouse using your ruler. Indicate the length, in centimeters, of the longer and shorter sides.

9.6 cm

17.4 cm

End of Birdhouse section.