Geometry – Unit 6

Tentative TEST date_____

Reflect – previous TEST mark _____, Overall mark now_____.
Looking back, what can you improve upon?

Learning Goals/Success Criteria

Use the following checklist to help you determine what you know well and where you need additional review.

DAYS & Pages	Can you…	No, I cannot. I need to learn this.	I kind of get it. I don't get the right answers very often.	I get it. I could work on being more consistent.	Yes, I can. I have perfected this!
Day 1 Pg 2-3	Recognize and explain real life applications of geometric shapes and figures?	☐	☐	☐	☐
	Apply metric and imperial systems of measurement?	☐	☐	☐	☐
Day 2 Pg 4-5	Represent 3D objects with nets?	☐	☐	☐	☐
	Represent 3D objects with patterns?	☐	☐	☐	☐
Day 3 Pg 6-7	Represent 3D objects with isometric drawings?	☐	☐	☐	☐
	Represent 3D objects with orthographic drawings?	☐	☐	☐	☐
Day 4 Pg 8-10	Represent 3D objects with scale drawings or models?	☐	☐	☐	☐
	Create plans from real life models?	☐	☐	☐	☐
Day 5 Pg 11-12	Solve design problems given constraints?	☐	☐	☐	☐
Day 6 Pg 13-17	REVIEW				

Length

between imperial + metric
30.48 cm = 1 foot
2.54 cm = 1 inch
1.6 km = 1 mile

within metric
10 mm = 1 cm
100 cm = 1 m
1000 m = 1 km

within imperial
12 in = 1 ft
3 ft = 1 yard
1760 yd = 1 mile

Mass

28.35 g = 1 ounce
0.454 kg = 1 pound
0.907 t = 1 ton (US)
454 g = 1 pound

1000 g = 1 kg
1000 kg = 1 t

16oz = 1lb
2000 lb = 1ton

Volume
15 mL = 1 tbsp
29.574 mL = 1 fluid ounce
0.473 L = 1 pint
3.785 L = 1 gallon
1L = 4 cups

1000 mL = 1 L

16 tbsp = 1cup
16 fl oz = 1 pint
2 pints = 1 quart
8 pints = 1 gallon

DAY 1 – Geometric Shapes

1. Each of the chairs pictured has a special feature.
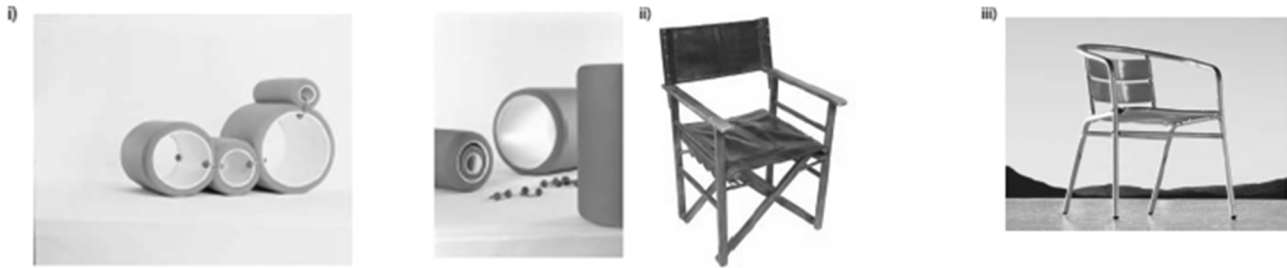
| DESCRIPTION	Forty of these chairs can be stacked in a space 4 feet high.	This chair can be folded for storage.	This chair can be taken apart and the pieces stored inside each other.
Match each chair with its description.			
Justify your answer.			
Identify some of the geometric shapes and figures in each design.			
How do these shapes and figures help the chair to function?			

2. Convert each of the following to inches.
   a. 6'
    b. 5'10"
    c. 8.4'

3. Chris is sewing curtains and needs 20 ft of fabric. The local fabric store sells fabric by the yard. How many yards of fabric does Chris need?

4. A Canadian football field is 100.1 m and an American Football field is 100 yd long. How many feet longer is the Canadian field?

5. Joe is travelling in the United States. A road sign indicates he is 228 mi from his destination. How many kilometres is Joe from his destination?

6. You have a $^3/_{16}$ in drill bit. Will it drill a hole large enough to fit a 5 mm bolt? Explain.

7. You own a car that consumes diesel fuel at a rate of 6.7L/100km. On a 2500km trip to the East Coast you estimate that the average fuel price will be $0.93/L. What will be your estimated fuel cost to drive the 2500km trip?

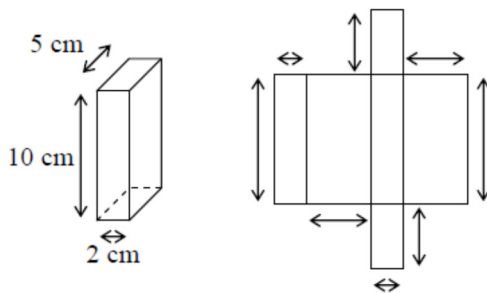## DAY 2 – Nets and Patterns

1. Match each solid with its net:

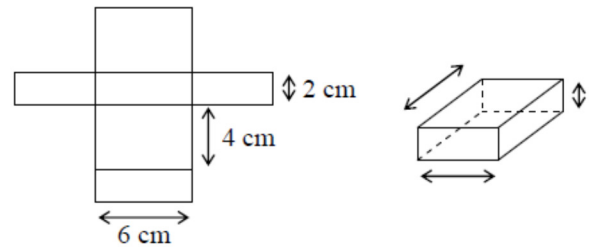| Net	Solid
1	
2	
3	
4	
5	
6	
7	

a. *b.*

c. *d.*

e. *f.*

g.
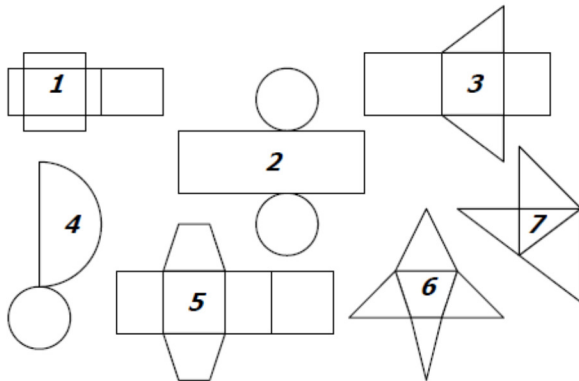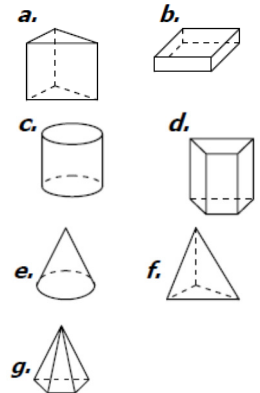
2. Fill in the missing dimensions.

a.

5 cm

10 cm

2 cm

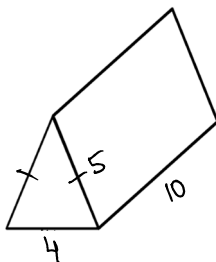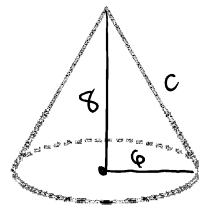b.

2 cm

4 cm

6 cm

3. Draw a net for each shape and label dimensions.
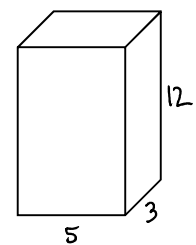
a.

5

10

4

b. hint find c

c
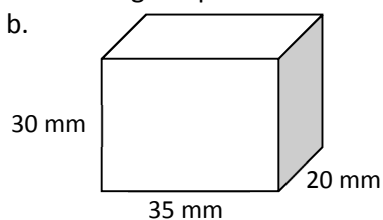
8

6
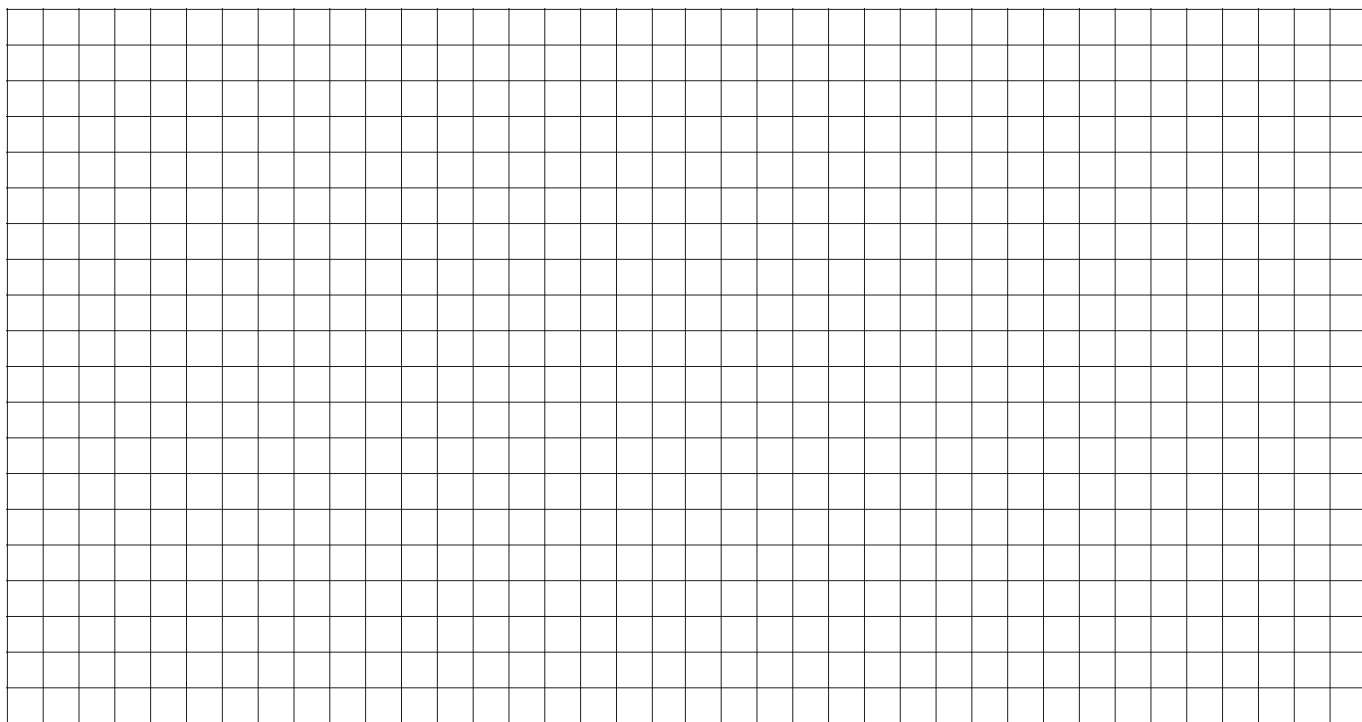
c. hint find circumference d.

3

9

12

5

3
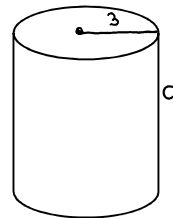
4. Draw the net of the following objects using appropriate scales on graph paper.

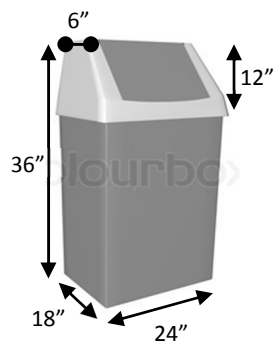   a. a triangular prism with triangle side lengths 10cm and prism height 30cm.

   b.

   30 mm   20 mm   35 mm

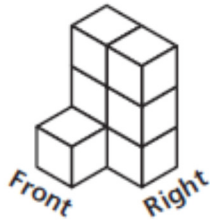   c. Adjust the picture for b. to change the net to become a pattern of a cardboard box.

5. Create a net for the trash can pictured below. Indicate what dimensions on the net are not provided with the following picture
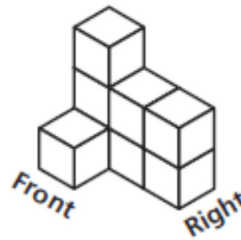

6"
12"
36"
18"
24"

DAY 3 – Isometric & Orthographic Drawings

1. Make an isometric drawing of each cube structure.
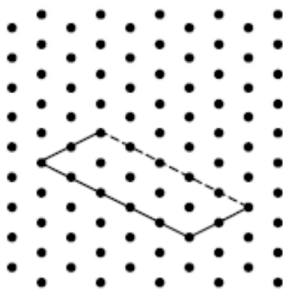
   a.

   b.

2. Use the given dimensions to complete each figure.

   b.
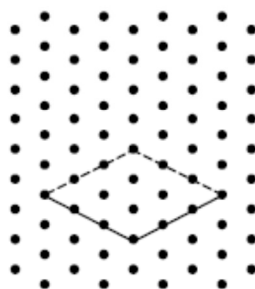
   a box with a
   5-unit by 2-unit base
   and height 4 units
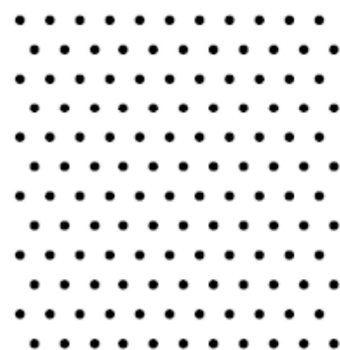
   b.

   a box with a
   3-unit by 3-unit base
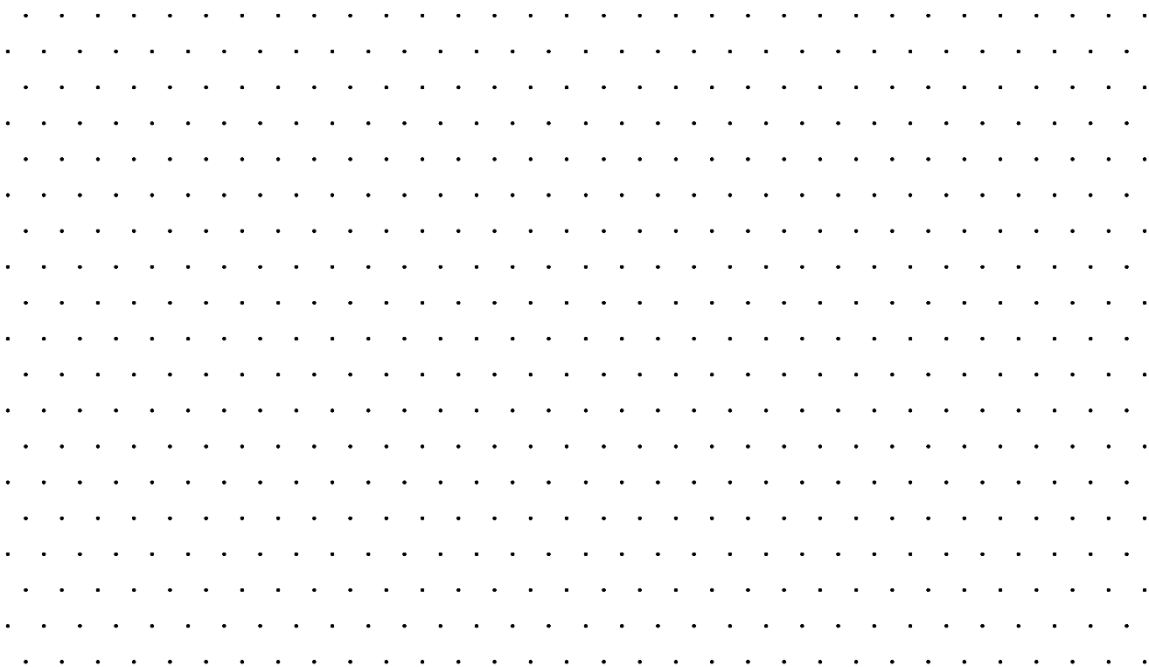   and height 3 units

   c.

   a box with a
   3-unit by 4-unit base
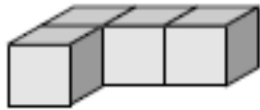   and height 2 units

3. Use block letters to make an isometric drawing of your initials.

4. Draw all 6 orthographic views of each object. Assume there are no hidden cubes.

   a.

   Top: Bottom: Front
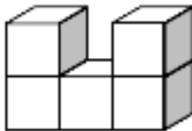
   Back: Left: Right

   b.

   Top: Bottom: Front:

   Back: Left: Right:

5. Create the top, front and side orthographic views of the table below.

6. Which figure at right represents orthographic views of the isometric drawing on the left? Explain how you made your choice.
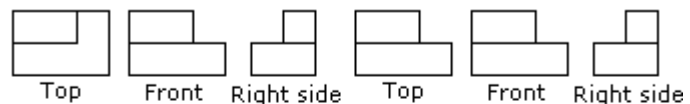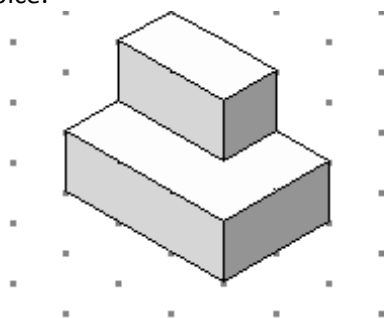
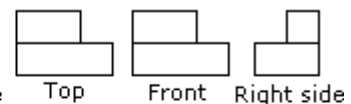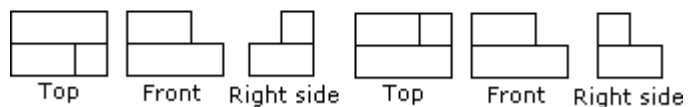   Top   Front   Right side   Top   Front   Right side
       Figure 1   **Figure 2**

   Top   Front   Right side   Top   Front   Right side
       Figure 3   **Figure 4**
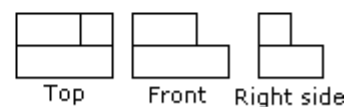
DAY 4 – Plans and Scale Models

1. Find the missing dimension using the scale factor of 1:12.

ITEM	MODEL	ACTUAL
length of mattress	6.25 in	_____ in
length of corvette	_____ in	15 ft
depth of water tower	32 cm	_____ m
width of wingspan	5.4 ft	_____ yd
diameter of football helmet	_____ mm	21 cm

2. A scale is 1 cm : 20 m.
   Describe and correct the error in finding the actual distance that corresponds to 5 cm.
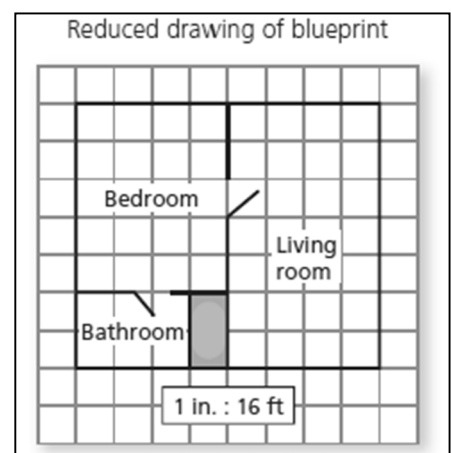
   $$\frac{1\,cm}{20\,m} = \frac{x\,m}{5\,cm}$$
   $$x = 0.25\,m$$

3. In a blueprint, each square has a side length of $\frac{1}{4}$ inch.

   a. Ceramic tile costs $5 per square foot. How much would it cost to tile the bathroom?

   Reduced drawing of blueprint

   Bedroom

   Living room

   Bathroom

   1 in. : 16 ft

b. Carpet costs $18 per square yard. How much would it cost to carpet the bedroom and living room?

c. Which has a higher unit cost, the tile or the carpet? Explain.

4. The Benson's have just moved into a new house. They have some information about their new living room (below).

a. Give the scale-drawing measurements of the room and each piece of furniture if the scale is
8 squares = 5 ft.

|	actual measurements	scale-drawing measurements (squares of grid)
the room	27.5 ft × 16.25 ft	
2 equally spaced windows (along the length of the room)	33 in wide	
a door (on the wall across from the windows)	5 ft	
The Benson's would like to put the following furniture in their room:		
a sofa	90 in × 30 in	
2 easy chairs	36 in × 27 in	
a rocking chair	21 in × 34 in	
a table	42 in × 39 in	
a plant stand	21 in × 18 in	
an entertainment unit	54 in × 24 in	

b. Create a scale drawing of their living room. Show a possible arrangement of the furniture in your drawing.
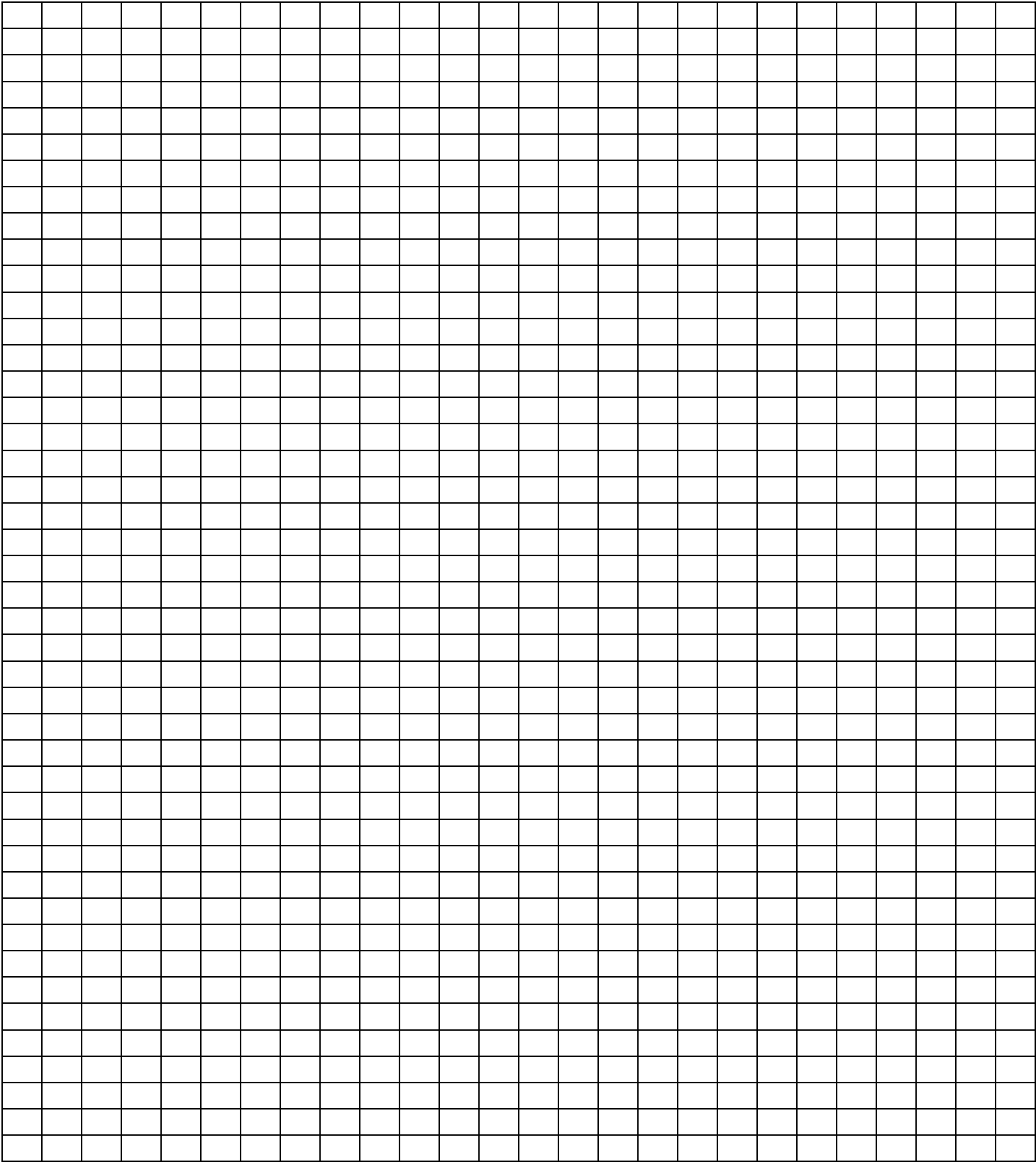
DAY 5 – Solve Problems

1. A new laundry detergent will be sold in a cubical box. The box must hold 1L of detergent. Find the side length of the box. (1L = 1000 cm^3)

2. A flexible floating pipe is used to contain an oil spill. The pipe can contain a depth of 50 cm of oil. It is placed around a leaking tanker carrying 200 000 m^3 of oil. The pipe is laid such that it forms a circle around a leaking tanker. What length of pipe is needed to contain all of the oil?

3. Farmer MacDonald sketched an isometric perspective drawing of a new chicken coop that he would like to build. The space between pairs of dots represents 1 m.
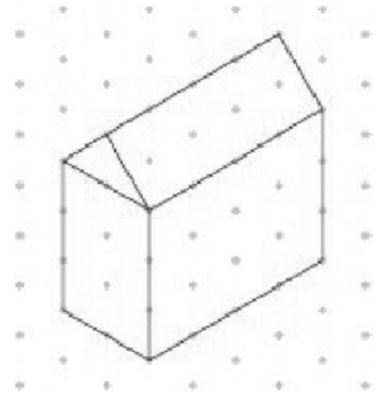
   a. Draw a set of orthographic drawings for the coop.

   b. Draw a net that can be used to make a scale model of the coop.

   c. All sides of the coop except the floor will be made of sheet metal, which sells for $15/m². Estimate the cost of buying the sheet metal for the coop.

REVIEW

1. This traditional Vietnamese hat is called a Non La.

    a. Which geometric shape does the Non La resemble?

    b. How does the hat's form protect the person wearing it from the sun and the rain?
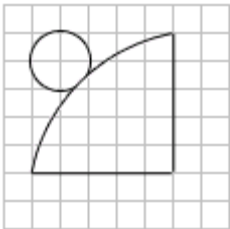
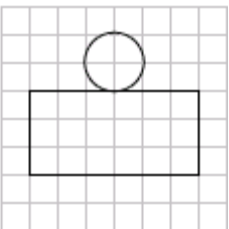2. Which of the following is the net for a cone?
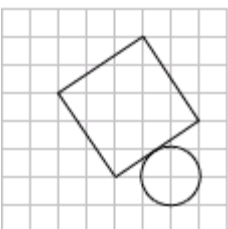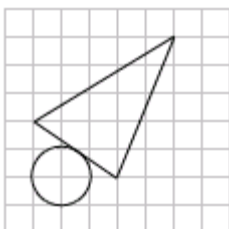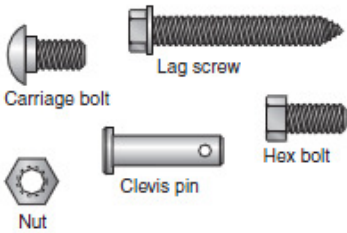

Figure 1   Figure 2   Figure 3   Figure 4
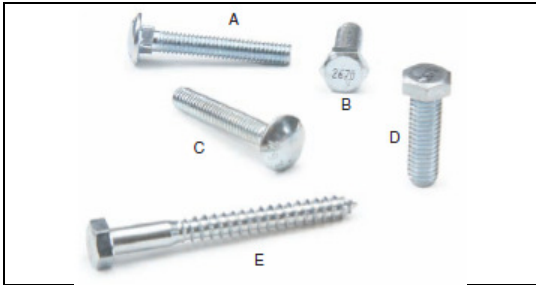
3. Lesley is installing an automatic garage door opener. The manual includes drawings of the hardware included in the package.

   a. Are these isometric drawings or orthographic views? Justify your answer.

    b. At each step of the installation, it is important to use the bolt or screw specified in the instructions. Use the drawings to identify each bolt and screw in the photo.

A _____

B _____

C _____

D _____

E _____

4. Determine which set of orthographic drawings match the isometric drawing in each case.

5. A new specialty fruit and nut bar is being made. The bar has a diamond cross-section made up of two congruent equilateral triangles with side length 12 cm.
    a. The bar is 24 cm long. Draw a set of orthographic drawings for the bar. Include measurements.
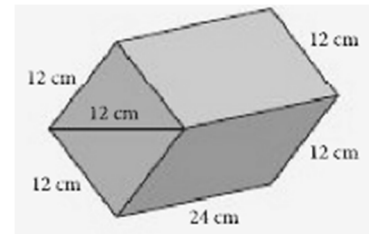
    b. Select a suitable scale, and draw a net that could be used to make a scale model of the package. Include measurements.

6. Andrea received a pet budgie in a cylindrical cage with a diameter of 60 cm and a height of 50 cm. Andrea needs a night cover for the cage. The cover requires a top of sides, but no bottom. Select a suitable scale, and draw a pattern that could be used to cut the pieces of cloth needed to make the cover.

7. A gift box for a travel mug will have a square base with side length 4 in. and a square lid with side length 4.5 in and depth of 0.5in. The box must be 5 in. high. Select a scale, and draw nets that can be used to make a model of the box and the lid. Show all measurements on the net.

8. Below is a sketch of the floor plan of a crime scene. This drawing uses a scale of 1 : 50. Complete the chart.

Part of Room	Measure the Scale Drawing (cm)	Measurement in real life (cm).	Conversion to inches (in).
Length of room			
Width of room			
door			
window			
closet			
wall to right of window			
wall to left of window			
wall to left of closet			
wall to the right of door			

Closet   Door

Window