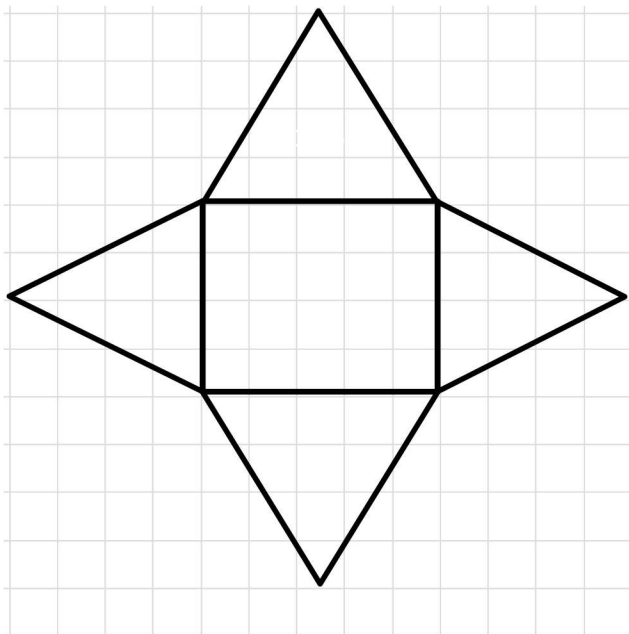


Name _____

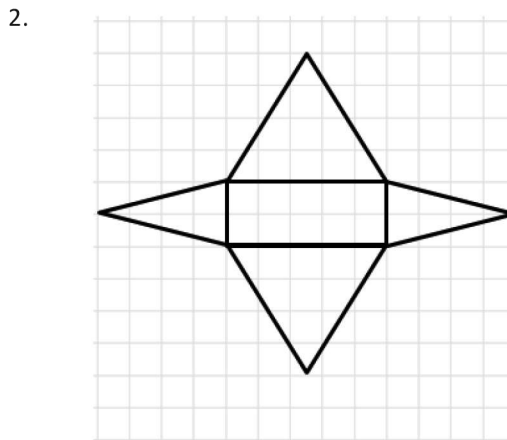
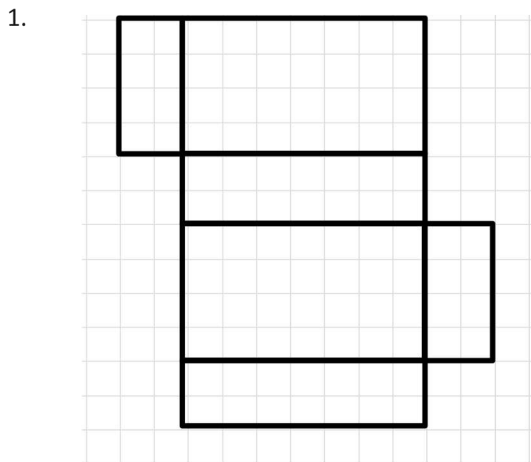
Date _____

From Nets to Surface Area

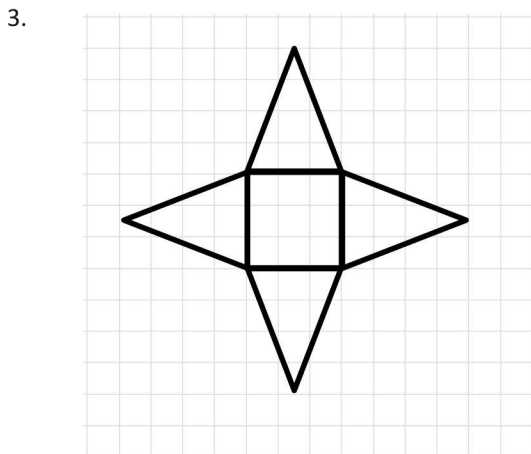
Name the shape, and then calculate the surface area of the figure. Assume each box on the grid paper represents a 1 in. \times 1 in. square.



Name the shape, and write an expression for surface area. Calculate the surface area of the figure. Assume each box on the grid paper represents a 1 ft. \times 1 ft. square.



Explain the error in each problem below. Assume each box on the grid paper represents a 1 m \times 1 m square.



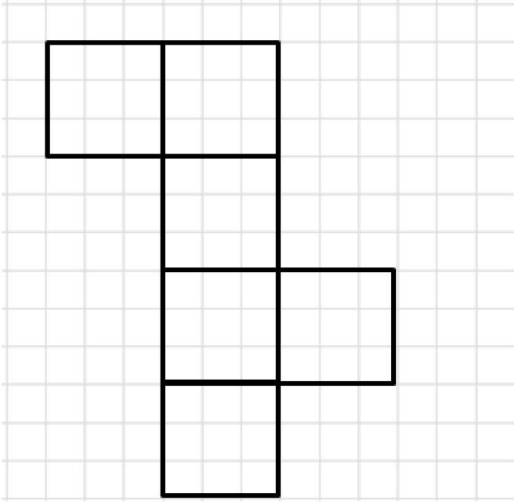
Name of Shape: Rectangular Pyramid, but more specifically a Square Pyramid

Area of Base: $3\text{ m} \times 3\text{ m} = 9\text{ m}^2$

Area of Triangles: $3\text{ m} \times 4\text{ m} = 12\text{ m}^2$

Surface Area: $9\text{ m}^2 + 12\text{ m}^2 + 12\text{ m}^2 + 12\text{ m}^2 + 12\text{ m}^2 = 57\text{ m}^2$

4.



Name of Shape: Rectangular Prism or, more specifically, a Cube

Area of Faces: $3 \text{ m} \times 3 \text{ m} = 9 \text{ m}^2$

Surface Area: $9 \text{ m}^2 + 9 \text{ m}^2 + 9 \text{ m}^2 + 9 \text{ m}^2 + 9 \text{ m}^2 = 45 \text{ m}^2$

5. Sofia and Ella are both writing expressions to calculate the surface area of a rectangular prism. However, they wrote different expressions.

a. Examine the expressions below, and determine if they represent the same value. Explain why or why not.

Sofia's Expression:

$$(3 \text{ cm} \times 4 \text{ cm}) + (3 \text{ cm} \times 4 \text{ cm}) + (3 \text{ cm} \times 5 \text{ cm}) + (3 \text{ cm} \times 5 \text{ cm}) + (4 \text{ cm} \times 5 \text{ cm}) + (4 \text{ cm} \times 5 \text{ cm})$$

Ella's Expression:

$$2(3 \text{ cm} \times 4 \text{ cm}) + 2(3 \text{ cm} \times 5 \text{ cm}) + 2(4 \text{ cm} \times 5 \text{ cm})$$

b. What fact about the surface area of a rectangular prism does Ella's expression show that Sofia's does not?

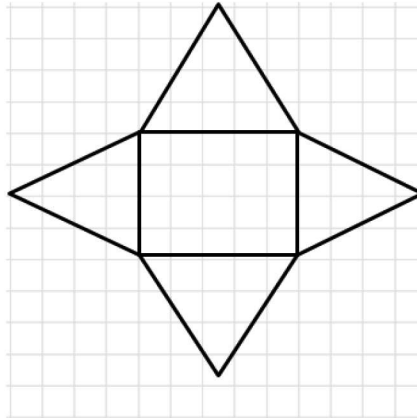
Name the shape, and then calculate the surface area of the figure. Assume each box on the grid paper represents a 1 in. \times 1 in. square.

Name of Shape: Rectangular Pyramid

Area of Base: 5 in. \times 4 in. = 20 in²

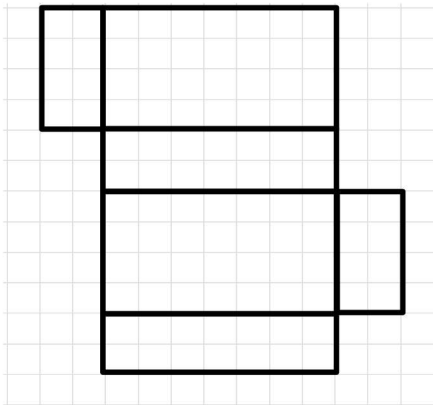
Area of Triangles: $\frac{1}{2} \times 4 \text{ in.} \times 4 \text{ in.} = 8 \text{ in}^2$, $\frac{1}{2} \times 5 \text{ in.} \times 4 \text{ in.} = 10 \text{ in}^2$

Surface Area: 20 in² + 8 in² + 8 in² + 10 in² + 10 in² = 56 in²



Name the shape, and write an expression for surface area. Calculate the surface area of the figure. Assume each box on the grid paper represents a 1 ft. \times 1 ft. square.

1.



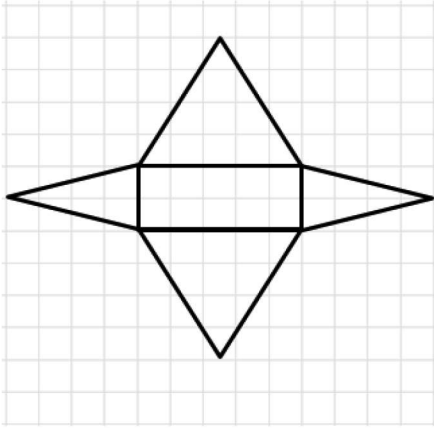
Name of Shape: Rectangular Prism

Surface Area: (2 ft. \times 4 ft.) + (2 ft. \times 4 ft.) + (4 ft. \times 7 ft.) + (4 ft. \times 7 ft.) + (7 ft. \times 2 ft.) + (7 ft. \times 2 ft.)

2(2 ft. \times 4 ft.) + 2(4 ft. \times 7 ft.) + 2(7 ft. \times 2 ft.)

16 ft² + 56 ft² + 28 ft² = 100 ft²

2.



Name of Shape: Rectangular Pyramid

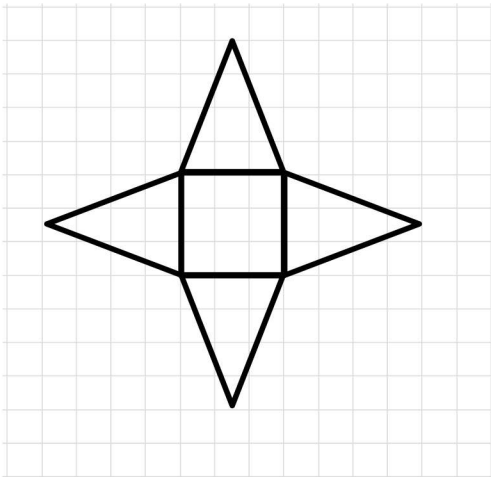
$$\text{Surface Area: } (2 \text{ ft.} \times 5 \text{ ft.}) + \left(\frac{1}{2} \times 2 \text{ ft.} \times 4 \text{ ft.}\right) + \left(\frac{1}{2} \times 2 \text{ ft.} \times 4 \text{ ft.}\right) + \left(\frac{1}{2} \times 5 \text{ ft.} \times 4 \text{ ft.}\right) + \left(\frac{1}{2} \times 5 \text{ ft.} \times 4 \text{ ft.}\right)$$

$$2 \text{ ft.} \times 5 \text{ ft.} + 2 \left(\frac{1}{2} \times 2 \text{ ft.} \times 4 \text{ ft.}\right) + 2 \left(\frac{1}{2} \times 5 \text{ ft.} \times 4 \text{ ft.}\right)$$

$$10 \text{ ft}^2 + 8 \text{ ft}^2 + 20 \text{ ft}^2 = 38 \text{ ft}^2$$

Explain the error in each problem below. Assume each box on the grid paper represents a $1 \text{ m} \times 1 \text{ m}$ square.

3.



Name of Shape: Rectangular Pyramid, but more specifically a Square Pyramid

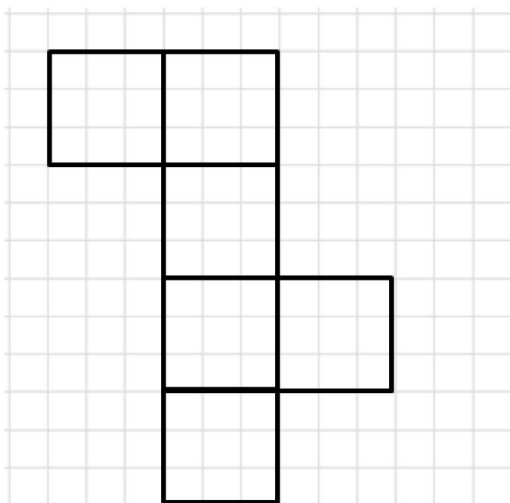
$$\text{Area of Base: } 3 \text{ m} \times 3 \text{ m} = 9 \text{ m}^2$$

$$\text{Area of Triangles: } 3 \text{ m} \times 4 \text{ m} = 12 \text{ m}^2$$

$$\text{Surface Area: } 9 \text{ m}^2 + 12 \text{ m}^2 + 12 \text{ m}^2 + 12 \text{ m}^2 + 12 \text{ m}^2 = 57 \text{ m}^2$$

The error in the solution is the area of the triangles. In order to calculate the correct area of the triangles, you must use the correct formula $A = \frac{1}{2}bh$. Therefore, the area of each triangle would be 6 m^2 and not 12 m^2 .

4.



Name of Shape: Rectangular Prism or, more specifically, a Cube

$$\text{Area of Faces: } 3 \text{ m} \times 3 \text{ m} = 9 \text{ m}^2$$

$$\text{Surface Area: } 9 \text{ m}^2 + 9 \text{ m}^2 + 9 \text{ m}^2 + 9 \text{ m}^2 + 9 \text{ m}^2 = 45 \text{ m}^2$$

The surface area is incorrect because the student did not find the sum of all 6 faces. The solution shown above only calculates the sum of 5 faces. Therefore, the correct surface area should be $9 \text{ m}^2 + 9 \text{ m}^2 + 9 \text{ m}^2 + 9 \text{ m}^2 + 9 \text{ m}^2 + 9 \text{ m}^2 = 54 \text{ m}^2$ and not 45 m^2 .

5. Sofia and Ella are both writing expressions to calculate the surface area of a rectangular prism. However, they wrote different expressions.
- a. Examine the expressions below, and determine if they represent the same value. Explain why or why not.

Sofia's Expression:

$$(3 \text{ cm} \times 4 \text{ cm}) + (3 \text{ cm} \times 4 \text{ cm}) + (3 \text{ cm} \times 5 \text{ cm}) + (3 \text{ cm} \times 5 \text{ cm}) + (4 \text{ cm} \times 5 \text{ cm}) + (4 \text{ cm} \times 5 \text{ cm})$$

Ella's Expression:

$$2(3 \text{ cm} \times 4 \text{ cm}) + 2(3 \text{ cm} \times 5 \text{ cm}) + 2(4 \text{ cm} \times 5 \text{ cm})$$

Sofia and Ella's expressions are the same, but Ella used the distributive property to make her expression more compact than Sofia's.

- b. What fact about the surface area of a rectangular prism does Ella's expression show that Sofia's does not?
A rectangular prism is composed of three pairs of sides with identical areas.