

### Filling and Wrapping Unit Test Review

**Standards**

- 7.G.4 Know the formulas for the area and circumference of a circle and use them to solve problems.
- 7.G.6 Solve real-world and mathematical problems involving volume and surface area of three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms.

1. A children's pony ride at the zoo has ponies attached to carousel pole in the center of a circle that the ponies walk around as children ride. Suppose the diameter of the circle is 25 feet. How many feet does a pony walk to complete one trip around the circle? Find the exact and approximate answers. Use your calculator's value of  $\pi$  and round your answers to the nearest hundredth.

$$C = \pi \cdot 25 = 25\pi \text{ ft walked}$$
$$\approx 78.54 \text{ ft walked}$$

2. The zoo also has a merry-go-round. To set up the merry-go-round, the zoo manager has to clear some land. The diameter of the merry-go-round is 18 feet. How much land does the manager need to clear in order to build the merry-go-round? Find the exact and approximate answers. Use your calculator's value of  $\pi$  and round your answers to the nearest hundredth.

$$A = \pi \cdot 9^2 = 81\pi \text{ ft}^2 \text{ of land}$$
$$\approx 254.47 \text{ ft}^2 \text{ of land}$$

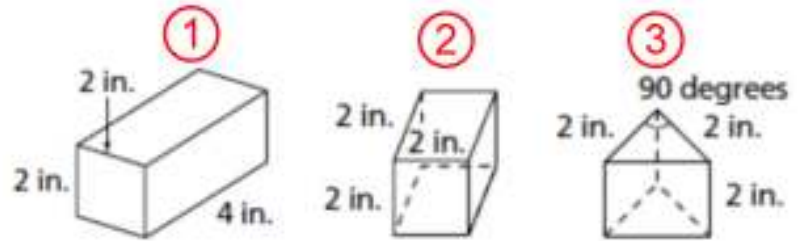
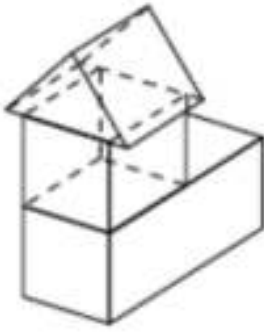
3. A circular cookie cutter has a 2.5 inch radius. The top of each cookie will be covered in frosting after it's baked. How much frosting is needed for each cookie? Find the exact and approximate answers. Use your calculator's value of  $\pi$  and round your answers to the nearest hundredth.

$$A = \pi \cdot 2.5^2 = 6.25\pi \text{ in}^2 \text{ of frosting}$$
$$\approx 19.63 \text{ in}^2 \text{ of frosting}$$

4. A manufacturing company is producing dinner plates with a diameter of 12 inches. They plan to put a gold edge on each plate. How much gold edging is needed for each plate? Find the exact and approximate answers. Use your calculator's value of  $\pi$  and round your answers to the nearest hundredth.

$$C = \pi \cdot 12 = 12\pi \text{ in of gold}$$
$$\approx 37.70 \text{ in of gold}$$

5. Billy used the three toy prisms on the right, to build the house pictured below.



a. How much space does the house take up? Show all work CLEARLY.

$$\textcircled{1} 2 \bullet 4 \bullet 2 = 16 \quad \textcircled{2} 2 \bullet 2 \bullet 2 = 8 \quad \textcircled{3} \left( \frac{2 \bullet 2}{2} \right) \bullet 2 = 4$$

$$V = 16 + 8 + 4 = 28 \text{ in}^3 \text{ of space}$$

b. How much paint is needed to decorate the house? Show ALL work CLEARLY.

$$\text{top 2 rectangles: } 2(2 \bullet 2) = 8 \quad \text{top 2 triangles: } 2\left(\frac{2 \bullet 2}{2}\right) = 4$$

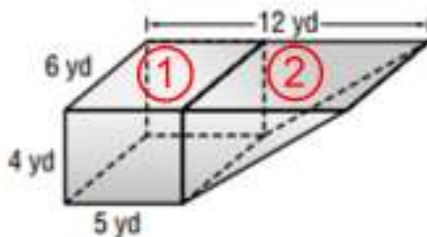
$$\text{middle 4 rectangles: } 4(2 \bullet 2) = 16 \quad \text{top rectangle: } 2 \bullet 2 = 4$$

$$\text{front/back rectangles: } 2(2 \bullet 2) = 8 \quad \text{left/right rectangles: } 2(4 \bullet 2) = 16$$

$$\text{bottom rectangle: } 2 \bullet 4 = 8$$

$$SA = 8 + 4 + 16 + 4 + 8 + 16 + 8 = 64 \text{ in}^2 \text{ of paint}$$

6. Jane is designing a rock climbing structure for a local park. Below is her finished structure.



a. She wants to paint the structure to look a mossy cliff (she doesn't need to paint any of the under sides the structure). How much paint is needed? Show ALL work CLEARLY.

$$\text{left side rectangle: } 4 \bullet 6 = 24$$

$$\text{top left rectangle: } 5 \bullet 6 = 30$$

$$\text{top right rectangle: } 7 \bullet 6 = 42$$

$$\text{front/back triangles: } 2\left(\frac{4 \bullet 7}{2}\right) = 28 \quad \text{front/back rectangles: } 2(4 \bullet 5) = 40$$

$$SA = 30 + 42 + 28 + 40 + 24 = 164 \text{ yd}^2 \text{ of paint}$$

b. How much concrete does the structure need? Show ALL work CLEARLY.

$$\textcircled{1} 4 \bullet 5 \bullet 6 = 120$$

$$\textcircled{2} \left( \frac{4 \bullet 7}{2} \right) \bullet 6 = 84$$

$$V = 120 + 84 = 204 \text{ yd}^3 \text{ of concrete}$$