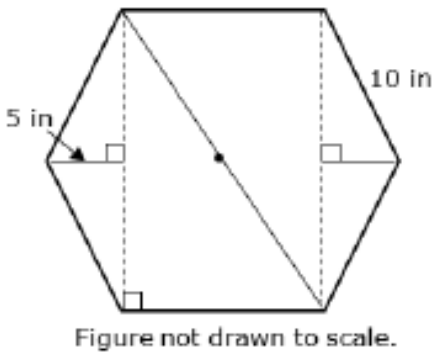For homework, Montra calculates the area of the regular hexagon shown below. She deconstructs the hexagon into several geometric figures, but makes an error in her calculations.

Montra's Work

Area of hexagon = (area of rectangle) + (area of 4 right triangles)

$$\text{Area} = (10)\left(10\sqrt{3}\right) + \frac{1}{2}(5)\left(10\sqrt{3}\right)(4)$$

Area = $100\sqrt{3} + 100\sqrt{3}$

Area = $200\sqrt{3}$ in²

Figure not drawn to scale.

(figure labels: 10 in, 5 in)

Which answer choice below corrects the error in Montra's work?

F. Area $= \frac{1}{2}(10)\left(10\sqrt{3}\right) + \frac{1}{2}(5)\left(10\sqrt{3}\right)(4)$

G. Area $= \frac{1}{2}(5)\left(10\sqrt{3}\right)(6)$

H. Area $= 2(10)\left(10\sqrt{3}\right)$

J. Not here

An archery target is made up of three squares. Each interior square's vertex lies on the midpoint of the exterior square, as represented below.

25	50	25
50	100	50
25	50	25

20 in
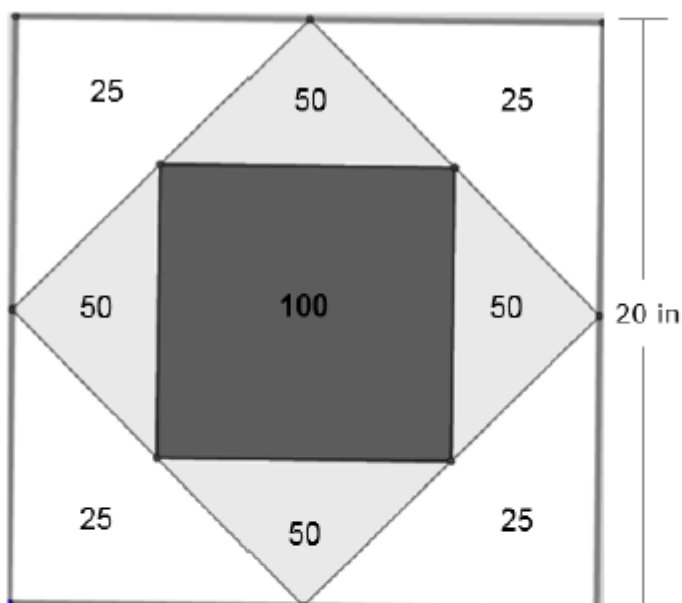
Figures are not drawn to scale.

What is the probability of hitting the 100-square with a dart on the first throw?

A. 75% because the 100-square is $\frac{3}{4}$ the area of the largest square.

B. 50% because the 100-square is $\frac{1}{2}$ the area of the largest square.

C. 25% because the 100-square is $\frac{1}{4}$ the area of the largest square.

D. 100% because the 100-square has the same area as the largest square.

Examine the similar triangles below.
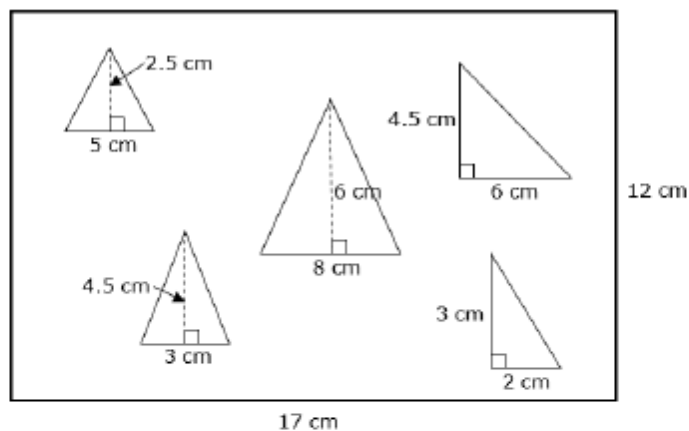

25 units
7 units
24 units
14 units
x
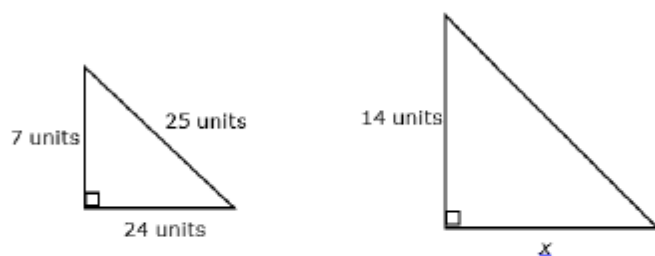
Figures are not drawn to scale.

What is the value of x?

Record your answer and be sure to use correct place value.

Each of the triangles in the figure below represents a hole on a board.

2.5 cm
5 cm
4.5 cm
6 cm
6 cm
12 cm
4.5 cm
3 cm
8 cm
3 cm
2 cm
17 cm

Figures are not drawn to scale.

What is the probability a dart thrown at the board will not go through one of the holes?

A. 26%

B. 52%

C. 74%

D. 85%

A ladder leaning against a building forms a 30° angle with the ground, but does not reach the top of the building.
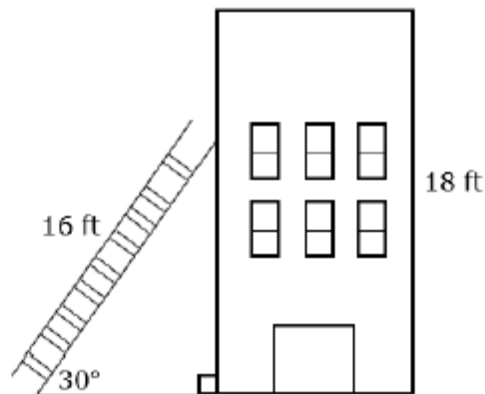

Figure is not drawn to scale.

How much taller must the ladder be to reach the top of the building and still form a 30° angle with the ground?

F. 2 ft

G. 10 ft

H. 20 ft

J. 36 ft

Mary built a greenhouse in the shape of a rectangular prism. Her neighbors complained that the greenhouse was too big, so Mary decided to tear down the greenhouse and rebuild it, reducing the dimensions to $\frac{1}{4}$ the original size. What effect does this have on the surface area of the greenhouse?

A. The new surface area will be $\frac{1}{2}$ the size of the original surface area.

B. The new surface area will be $\frac{1}{4}$ the size of the original surface area.

C. The new surface area will be $\frac{1}{8}$ the size of the original surface area.

D. The new surface area will be $\frac{1}{16}$ the size of the original surface area.

Monica built a wooden box that is a rectangular prism. For her next design, she will add three more sides to the polygonal base of the box and the corresponding lateral sides. What will be the resulting figure?

F. Pentagonal prism

G. Hexagonal prism

H. Heptagonal prism

J. Octagonal prism

Two regular hexagons with center C and apothems a and b are shown in the figure below. Each vertex of the smaller hexagon is a midpoint on a side of the larger hexagon.
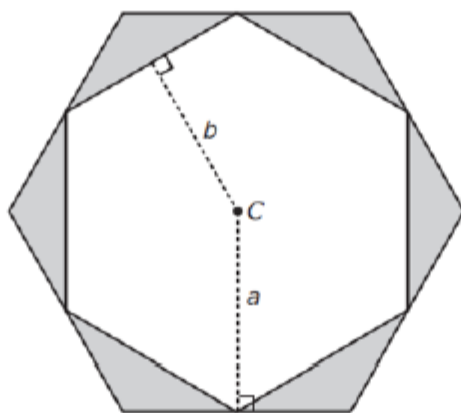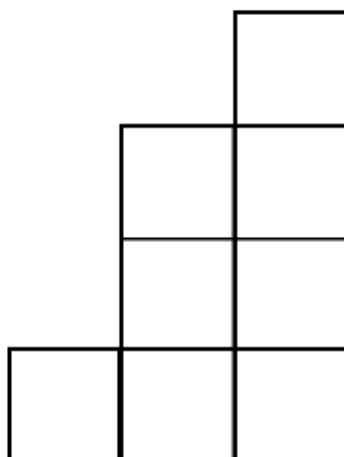

Figure is not drawn to scale.

If $a = 6\sqrt{3}$ cm and b = 9 cm, what is the total area, in square centimeters, of the shaded region?
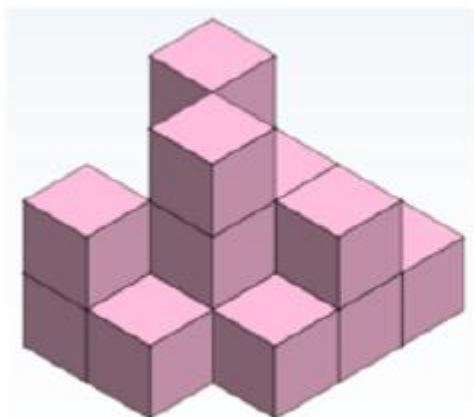
A. $324\sqrt{3}$

B. $162\sqrt{3}$

C. $54\sqrt{3}$

D. $9\sqrt{3}$

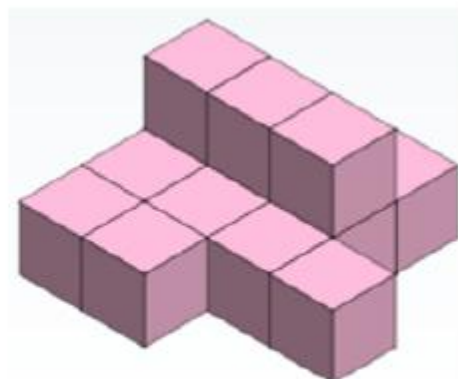The side view of a figure is shown below.

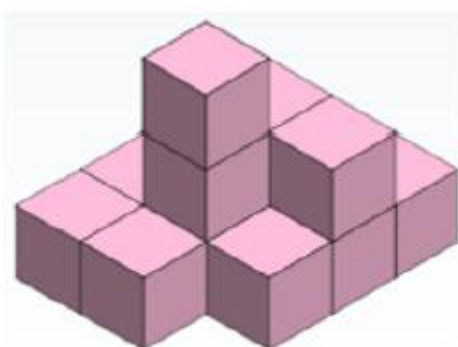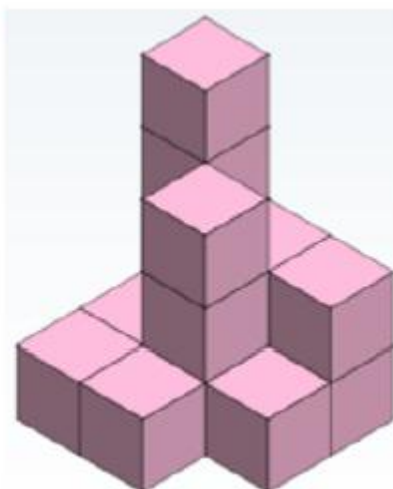Which figure below has the side view shown above?

A.

B.

C.

D.

A cone has a set radius and height. If the radius and height of the cone decreased to two-thirds their original length, which answer choice below would describe the new volume?

A. The volume of the new cone is $\frac{27}{8}$ the volume of the original cone.

B. The volume of the original cone is $\frac{8}{27}$ the volume of the new cone.

C. The volume of the new cone is $\frac{8}{27}$ the volume of the original cone.

D. Not here

The net for a cylindrical carton of oatmeal is shown below.
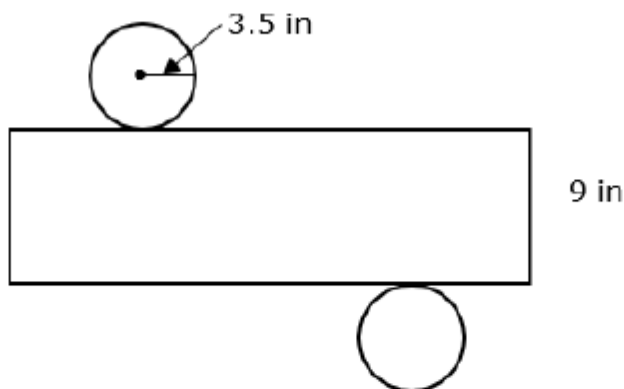

3.5 in

9 in

Figure is not drawn to scale.

What is the volume, to the nearest hundredth of a cubic inch, of the carton of oatmeal created by the net above?

A. 110.25

B. 197.92

C. 274.89

D. 346.36