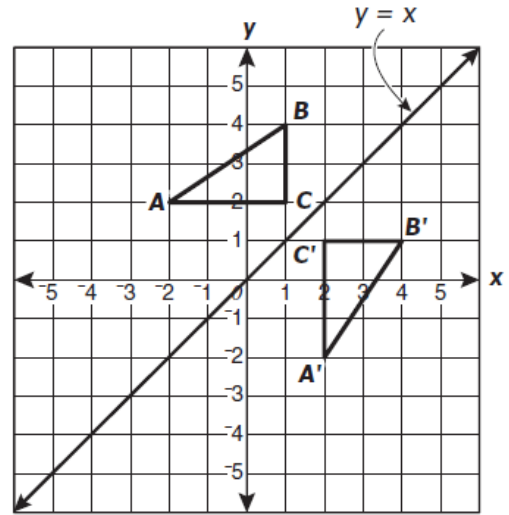


**Directions:** To receive full credit, show all required work. Questions may have multiple correct answers. Clearly indicate the answers chosen. For multiple choice questions, circle the correct answer.

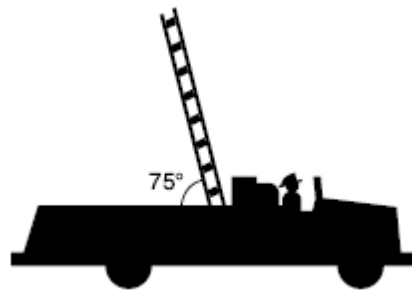
1.  $\triangle A'B'C'$  is apparently the result of –
- A. reflecting  $\triangle ABC$  across the y-axis
  - B. reflecting  $\triangle ABC$  across the x-axis
  - C. rotating  $\triangle ABC$  about the point (1, 2)
  - D. reflecting  $\triangle ABC$  across the line  $y = x$



2. A fire truck has a ladder that can extend to 60 feet in length. The ladder can be safely raised to a maximum angle of  $75^\circ$  with the horizontal. Disregarding the height of the fire truck itself, which is the closest to the maximum height that the ladder can safely reach?

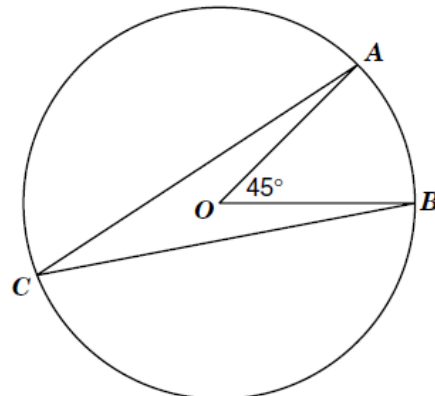
- A. 15.53 ft
- B. 57.96 ft
- C. 60.00 ft
- D. 62.12 ft

$\sin 75^\circ \approx 0.966$ $\cos 75^\circ \approx 0.259$ $\tan 75^\circ \approx 3.73$
--



3. If  $m\angle AOB = 45^\circ$  in circle O, what is  $m\angle ACB$ ?

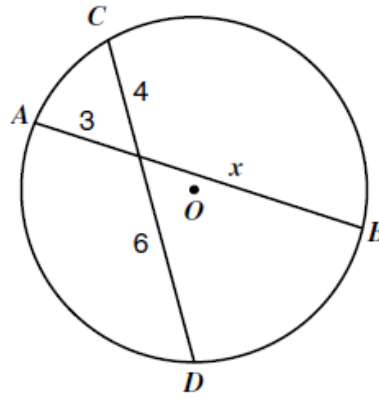
- A. 22.5
- B. 45
- C. 67.5
- D. 90



4. Chords  $\overline{AB}$  and  $\overline{CD}$  intersect, forming segments with the measures shown.

What is the value of  $x$ ?

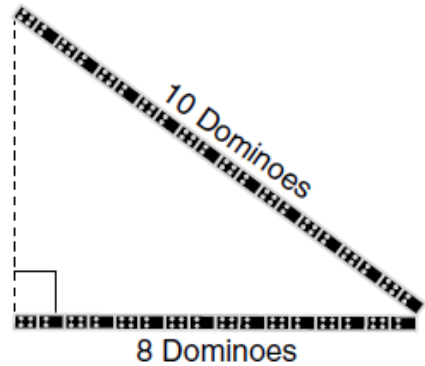
- A. 5
- B. 8
- C. 10
- D. 24



5. Scotty is making a train of dominoes on the floor.

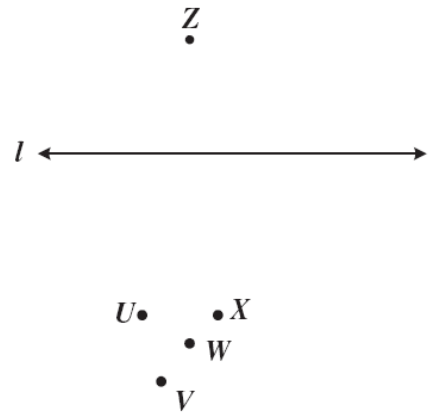
How many dominoes are needed to complete the triangle?

- A. 6
- B. 12
- C. 18
- D. 36



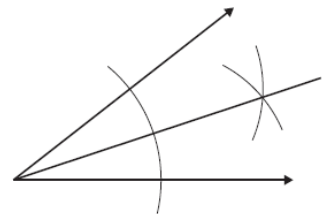
6. Which point is on the line  $\perp$  to  $l$  and passing through  $Z$ ?

- A. U
- B. V
- C. W
- D. X



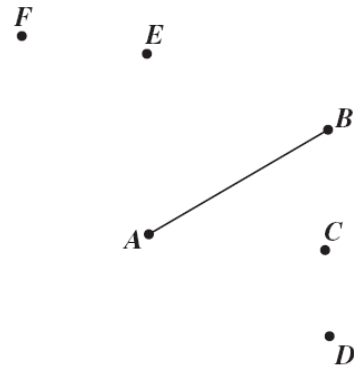
7. Which of the following constructions is illustrated?

- A. an angle congruent to a given angle
- B. bisector of a given angle
- C. bisector of a given segment
- D. the perpendicular bisector of a given segment



8. Which line segment is apparently congruent to  $\overline{AB}$ ?

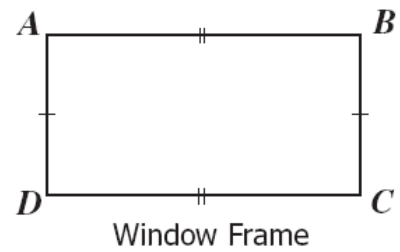
- A.  $\overline{AD}$
- B.  $\overline{AC}$
- C.  $\overline{AE}$
- D.  $\overline{AF}$



9. The opposite sides of a window frame are congruent.

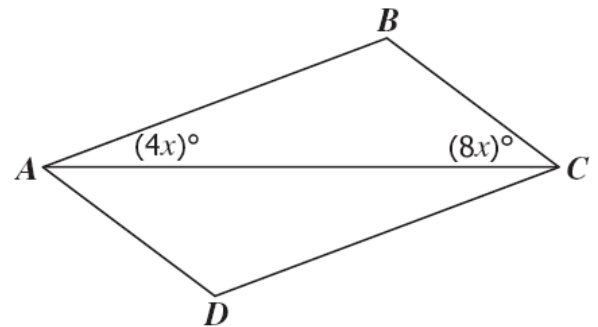
Which additional piece of information would verify that the frame is a rectangle?

- A.  $\angle B \cong \angle D$
- B.  $\overline{AC} \cong \overline{BD}$
- C.  $\overline{AC} \perp \overline{BD}$
- D.  $m\angle A + m\angle D = 180^\circ$



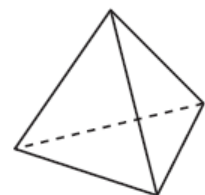
10. If ABCD is a parallelogram and  $x = 5$ , what is  $m\angle D$ ?

- A.  $100^\circ$
- B.  $120^\circ$
- C.  $140^\circ$
- D.  $160^\circ$



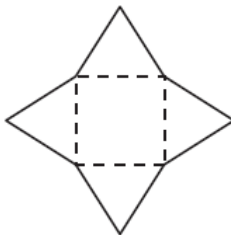
11. The following drawing to the right represents a tetrahedron.

Which of the following nets could be folded on the dashed lines to form a tetrahedron?

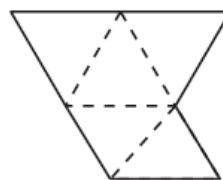


Tetrahedron  
4 Faces

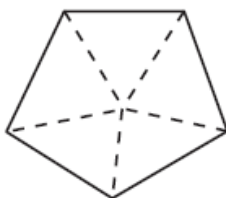
A.



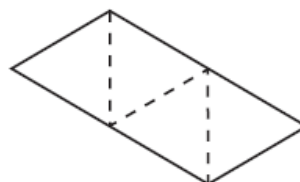
B.



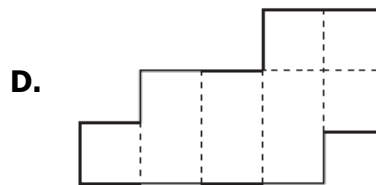
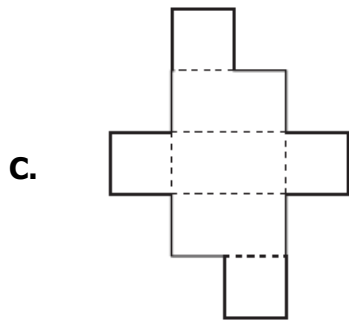
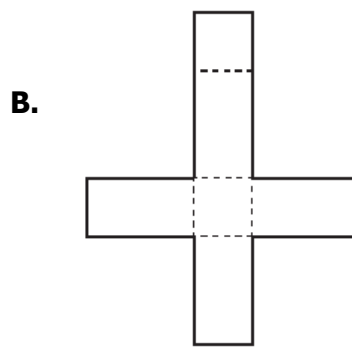
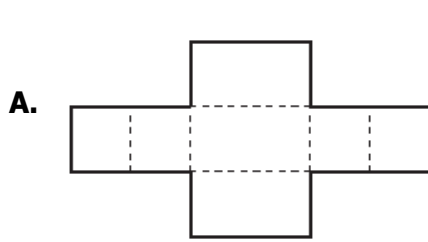
C.



D.



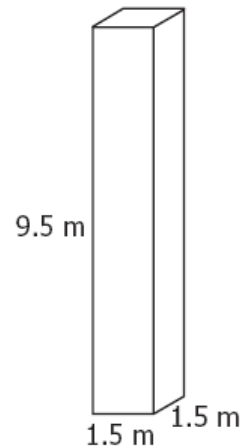
12. When folded on the dotted lines, which net(s) will form a rectangular prism?



13. A concrete pillar shaped as a rectangular prism is designed as follows.

Which is closest to the volume of concrete needed to fill the pillar?

- A.  $12.5 \text{ m}^3$
- B.  $14.3 \text{ m}^3$
- C.  $21.4 \text{ m}^3$
- D.  $28.5 \text{ m}^3$

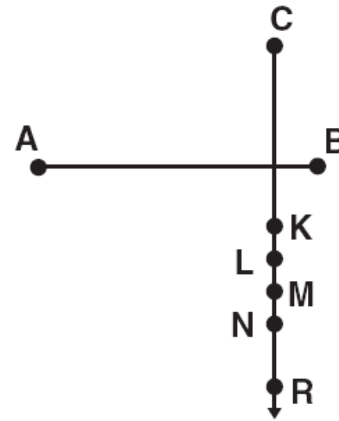


14. A right triangular pyramid has a height of 10 inches and a base area of 41.57 square inches. What is the volume, in cubic inches, of the pyramid?

- A. 138.56
- B. 207.85
- C. 277.13
- D. 415.69

15. Which segment is congruent to  $\overline{AB}$ ?

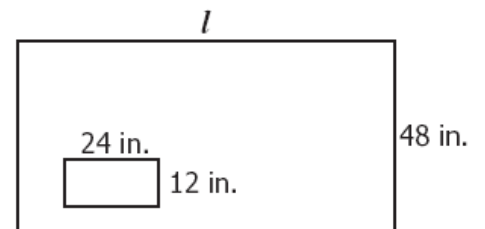
- A.  $\overline{CK}$
- B.  $\overline{CL}$
- C.  $\overline{CM}$
- D.  $\overline{CN}$



16. A rectangular placemat is similar to the table upon which it is placed.

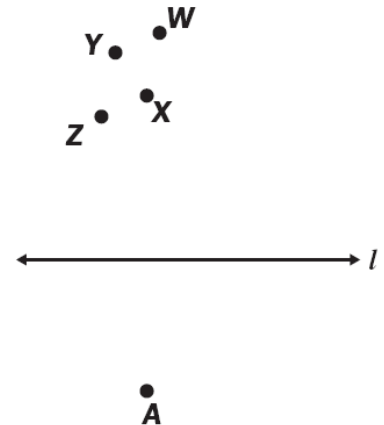
According to the diagram, which proportion can be used to determine the length of the table,  $l$ ?

- A.  $\frac{12}{48} = \frac{24}{l}$
- B.  $\frac{12}{24} = \frac{l}{48}$
- C.  $\frac{12}{l} = \frac{24}{48}$
- D.  $\frac{24}{12} = \frac{l}{48}$



17. Which point apparently lies on the perpendicular to  $l$  from A?

- A. X
- B. Y
- C. Z
- D. W



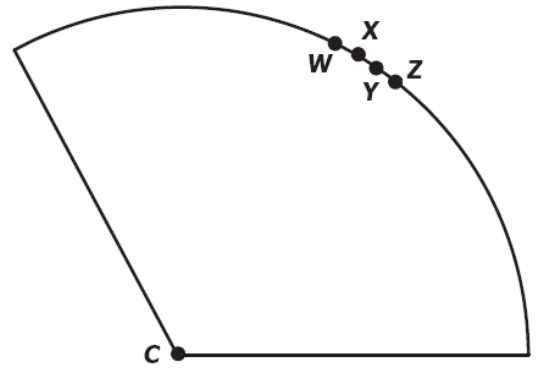
18. A pizza has a diameter of 16 inches. Which is closest to the area of one slice if the pizza is divided into 6 equal slices?

- A. 134.1 sq in.
- B. 117.1 sq in.
- C. 37.2 sq in.
- D. 33.5 sq in.

19. One piece of pie is left for two boys to share.

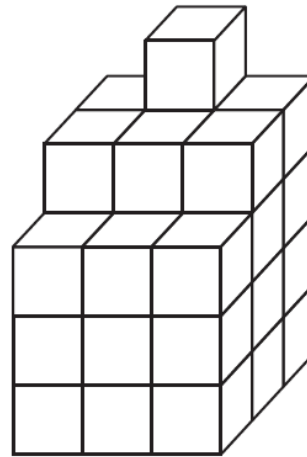
Where should the pie be cut to ensure each gets an equal piece?

- A.  $\overline{CZ}$
- B.  $\overline{CY}$
- C.  $\overline{CX}$
- D.  $\overline{CW}$



20. Assuming the solid is constructed from cubes measuring 1 unit on each edge and that the figure is completely solid, what is the volume of the cubic solid shown to the right?

- A. 12 cubic units
- B. 34 cubic units
- C. 59 cubic units
- D. 68 cubic units



21. Which is closest to the volume of a sphere with a radius equal to 8 centimeters?

- A.  $267.9 \text{ cm}^3$
- B.  $803.8 \text{ cm}^3$
- C.  $1,607.7 \text{ cm}^3$
- D.  $2,143.6 \text{ cm}^3$

22. What is the total surface area of a rectangular prism box that measures 5 feet by 1 foot by 1 foot?

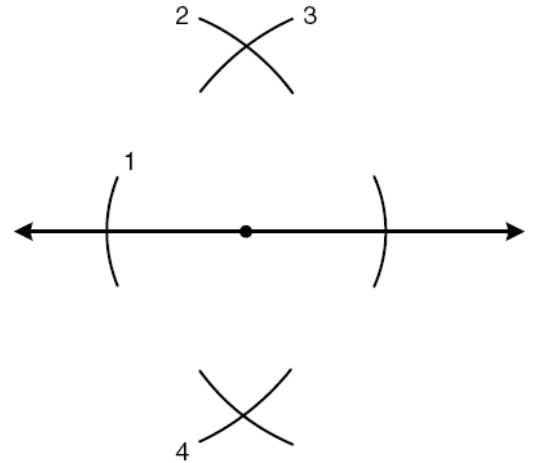
- A. 5 sq ft
- B. 20 sq ft
- C. 22 sq ft
- D. 30 sq ft

23. For the diagram shown to the right, draw a line connecting the construction shown and the arcs that must be drawn first?

Construction

First arcs drawn

- |  |   |
|--|---|
| Parallel line through a point not on the line  | 1 |
| Congruent angle                                | 2 |
| Angle bisector                                 | 3 |
| Perpendicular line through a point on the line | 4 |



24. A swimming pool is being filled at the rate of 12 cubic yards per minute. If the pool is 18 yards long, 10 yards wide, and 3 yards deep, how many minutes will it take to fill the pool?

- A. 45 minutes
- B. 101 minutes
- C. 540 minutes
- D. 1,233 minutes

25. Figure *STARFIND* is symmetric with respect to the  $x$ -axis. The coordinates of point  $A$  are  $(8, 6)$ . What are coordinates of point  $N$ ?

