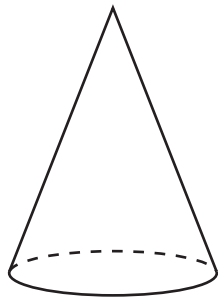


Part I

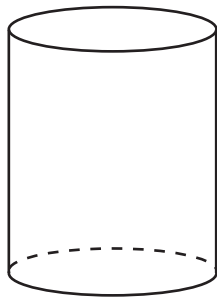
Answer all 24 questions in this part. Each correct answer will receive 2 credits. No partial credit will be allowed. Utilize the information provided for each question to determine your answer. Note that diagrams are not necessarily drawn to scale. For each statement or question, choose the word or expression that, of those given, best completes the statement or answers the question. Record your answers on your separate answer sheet. [48]

Use this space for
computations.

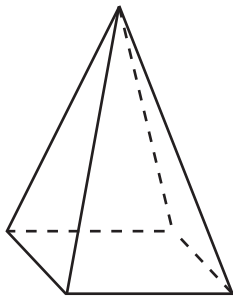
- 1 A student has a rectangular postcard that he folds in half lengthwise. Next, he rotates it continuously about the folded edge. Which three-dimensional object below is generated by this rotation?



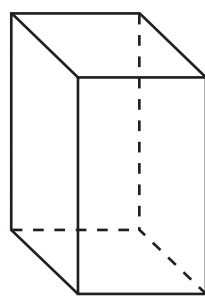
(1)



(3)



(2)



(4)

- 2 A three-inch line segment is dilated by a scale factor of 6 and centered at its midpoint. What is the length of its image?

- (1) 9 inches (3) 15 inches
(2) 2 inches (4) 18 inches

Use this space for
computations.

3 Kevin's work for deriving the equation of a circle is shown below.

$$x^2 + 4x = -(y^2 - 20)$$

STEP 1 $x^2 + 4x = -y^2 + 20$

STEP 2 $x^2 + 4x + 4 = -y^2 + 20 - 4$

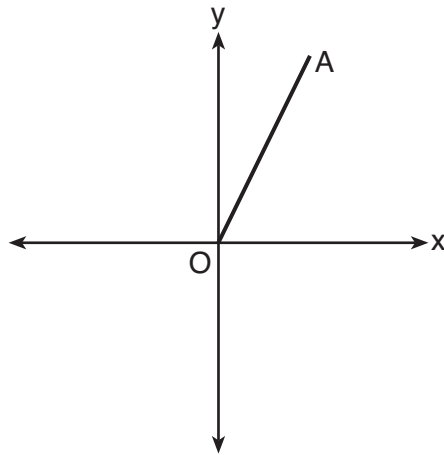
STEP 3 $(x + 2)^2 = -y^2 + 20 - 4$

STEP 4 $(x + 2)^2 + y^2 = 16$

In which step did he make an error in his work?

- (1) Step 1 (3) Step 3
(2) Step 2 (4) Step 4

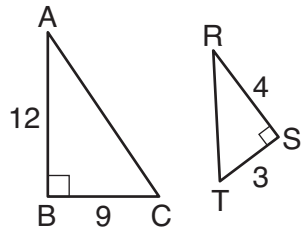
4 Which transformation of \overline{OA} would result in an image parallel to \overline{OA} ?



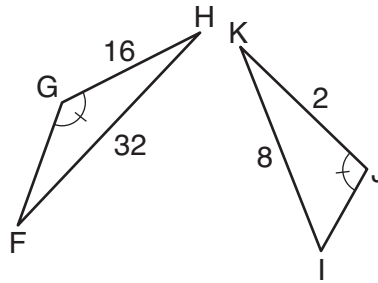
- (1) a translation of two units down
(2) a reflection over the x -axis
(3) a reflection over the y -axis
(4) a clockwise rotation of 90° about the origin

Use this space for computations.

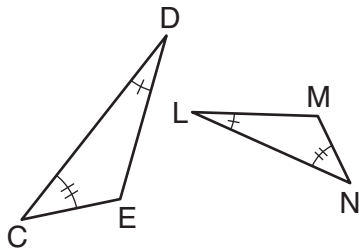
5 Using the information given below, which set of triangles can *not* be proven similar?



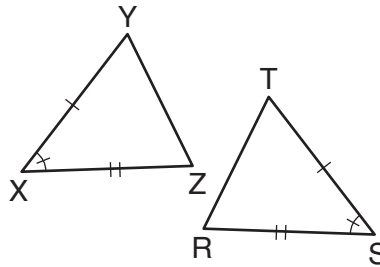
(1)



(3)



(2)



(4)

6 A company is creating an object from a wooden cube with an edge length of 8.5 cm. A right circular cone with a diameter of 8 cm and an altitude of 8 cm will be cut out of the cube. Which expression represents the volume of the remaining wood?

(1) $(8.5)^3 - \pi(8)^2(8)$

(3) $(8.5)^3 - \frac{1}{3}\pi(8)^2(8)$

(2) $(8.5)^3 - \pi(4)^2(8)$

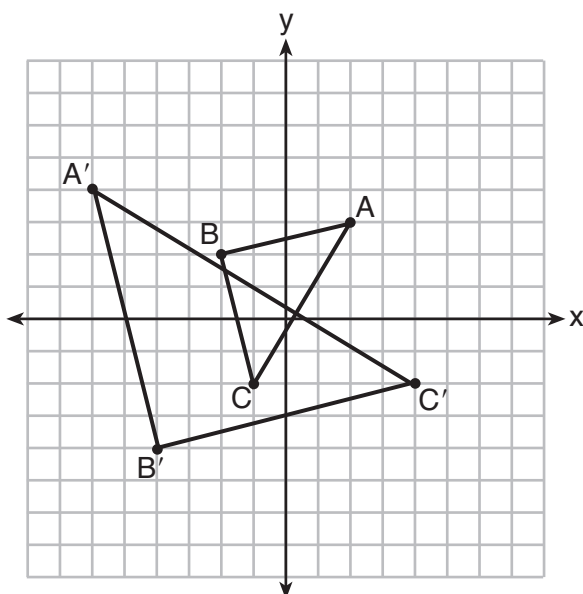
(4) $(8.5)^3 - \frac{1}{3}\pi(4)^2(8)$

7 Two right triangles must be congruent if

- (1) an acute angle in each triangle is congruent
- (2) the lengths of the hypotenuses are equal
- (3) the corresponding legs are congruent
- (4) the areas are equal

Use this space for
computations.

8 Which sequence of transformations will map $\triangle ABC$ onto $\triangle A'B'C'$?



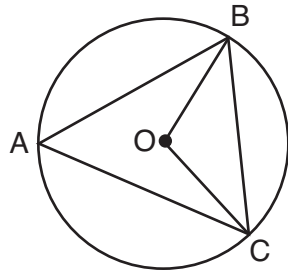
- (1) reflection and translation
- (2) rotation and reflection
- (3) translation and dilation
- (4) dilation and rotation

9 In parallelogram $ABCD$, diagonals \overline{AC} and \overline{BD} intersect at E . Which statement does *not* prove parallelogram $ABCD$ is a rhombus?

- (1) $\overline{AC} \cong \overline{DB}$
- (2) $\overline{AB} \cong \overline{BC}$
- (3) $\overline{AC} \perp \overline{DB}$
- (4) \overline{AC} bisects $\angle DCB$.

Use this space for
computations.

- 10 In the diagram below of circle O , \overline{OB} and \overline{OC} are radii, and chords \overline{AB} , \overline{BC} , and \overline{AC} are drawn.



Which statement must always be true?

- (1) $\angle BAC \cong \angle BOC$
 - (2) $m\angle BAC = \frac{1}{2}m\angle BOC$
 - (3) $\triangle BAC$ and $\triangle BOC$ are isosceles.
 - (4) The area of $\triangle BAC$ is twice the area of $\triangle BOC$.
- 11 A 20-foot support post leans against a wall, making a 70° angle with the ground. To the *nearest tenth of a foot*, how far up the wall will the support post reach?
- (1) 6.8
 - (2) 6.9
 - (3) 18.7
 - (4) 18.8
- 12 Line segment \overline{NY} has endpoints $N(-11,5)$ and $Y(5,-7)$. What is the equation of the perpendicular bisector of \overline{NY} ?

- (1) $y + 1 = \frac{4}{3}(x + 3)$
- (2) $y + 1 = -\frac{3}{4}(x + 3)$
- (3) $y - 6 = \frac{4}{3}(x - 8)$
- (4) $y - 6 = -\frac{3}{4}(x - 8)$

