TEST NAME: **Fall SOY Checkpoint Geometry Content**
TEST ID: **43**
GRADE: **08 - 12**
SUBJECT: **Mathematics**
TEST CATEGORY: **Start of Year Checkpoint**

Student: _____

Class: _____

Date: _____

Instructions

The Geometry test has two subparts. Each subpart contains different types of questions. To begin the test, click the "Next" arrow button at the top.


Read the passage - 'VH937030_directions' - and answer the question below:

VH937030_directions

Subpart 1 of this test contains different types of assessment questions in Geometry. You may make notes on scratch paper or use the Notepad tool within the online test. Make sure you answer all the questions. You MAY NOT use a calculator in Subpart 1 of this test.

1. The figure shown represents a machine part. A hole passes through the machine part from top to bottom.
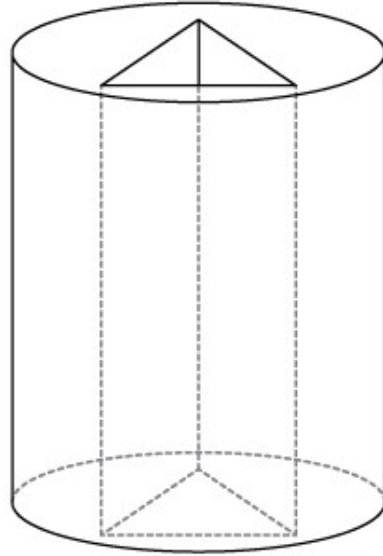
Marius wants to determine the volume of the machine part by subtracting the volume of one geometric shape from the volume of another geometric shape. Based on the figure, which two shapes should Marius use?

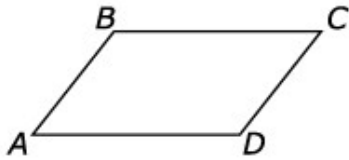Select **two** shapes.

Pick up to 2 answers.

A. a cone

B. a cylinder

C. a pyramid

D. a triangular prism

E. a rectangular prism

2.

For right triangle PQR with a right angle at Q, $\sin(P) = \frac{1}{2}$ and $\cos(P) = \frac{\sqrt{3}}{2}$.

What is $\tan R$?

A. $\dfrac{\sqrt{3}}{4}$

B. $\sqrt{3}$

C. $\dfrac{\sqrt{3}}{3}$

D. $\dfrac{4}{\sqrt{3}}$

3. A partial proof that the opposite angles of a parallelogram are congruent is shown.

Given: Quadrilateral *ABCD* is a parallelogram
Prove: ∠A ≅ ∠C

| Statements	Reasons
1. Quadrilateral *ABCD* is a parallelogram	1. Given
2. $\overline{BC}\|\overline{AD}$, $\overline{AB}\|\overline{DC}$	2.
3. ∠A and ∠B are supplementary; ∠B and ∠C are supplementary	3.
4. ∠A and ∠C are congruent	4.

Which reasons are missing from the proof?

Select **all** that apply.

Pick up to 6 answers.

A. Definition of parallelogram

B. Definition of parallel lines

C. When parallel lines are cut by a transversal, corresponding angles are congruent.

D. When parallel lines are cut by a transversal, consecutive interior angles are supplementary.

E. Angles supplementary to the same angle are congruent to each other.

F. Angles supplementary to the same angle are supplementary to each other.

4. Parallelogram $RSTU$ has midpoints K, L, M, N marked on the sides as shown.
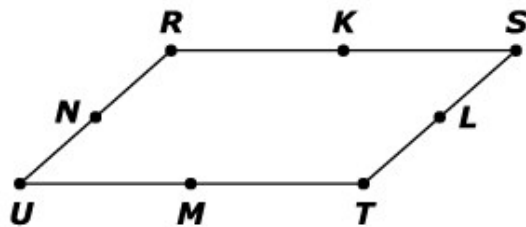
Which rigid motion could be applied to $\triangle RSU$ to show that $\triangle RSU \cong \triangle TUS$?

A. reflection over $\overline{SU}$

B. reflection over $\overline{LN}$

C. rotation $90°$ clockwise about the intersection point of $\overline{KM}$ and $\overline{LN}$

D. rotation $180°$ clockwise about the intersection point of $\overline{SU}$ and $\overline{RT}$

5. A fish tank in the shape of a rectangular prism holds 30 cubic feet of water. The tank has a length of 5 feet and a width of 3 feet. What is the depth, in feet, of the tank?

A. 2

B. 6

C. 10

D. 15

Read the passage - 'VH937170_directions' - and answer the question below:

VH937170_directions

Subpart 2 of this test contains different types of assessment questions in Geometry. You may make notes on scratch paper or use the Notepad tool within the online test. Make sure you answer all the questions. You MAY use a calculator in Subpart 2 of this test.

6. In the figure shown, Roland is to prove that $\overline{GH} \cong \overline{HJ}$.
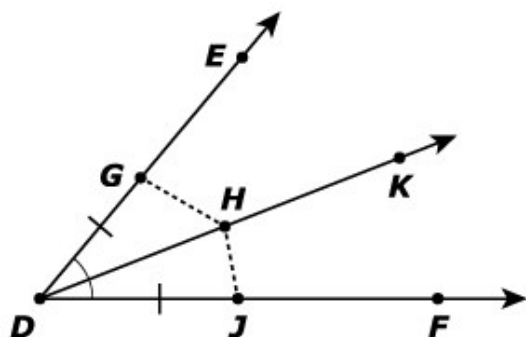
Part of his proof is shown in the table.

Statement	Reason
1. $\overline{DG} \cong \overline{DJ}$	1. Given
2. $\overrightarrow{DK}$ bisects $\angle EDF$	2. Given
3. $\angle GDH \cong \angle JDH$	3. Definition of angle bisector
4. $\overline{DH} \cong \overline{DH}$	4. Reflexive property
5. $\triangle DGH \cong \triangle DJH$	5. ?
6. $\overline{GH} \cong \overline{HJ}$	6. Corresponding parts of congruent triangles are congruent

What is the reason for statement 5?

A. AAS

B. ASA

C. SAS

D. SSS

7. On a coordinate plane, $\triangle ABC$ has vertices at $A(10, 5)$, $B(10, 15)$, and $C(5, 5)$. $\triangle A'B'C'$ has vertices at $A'(30,12)$, $B'(30,52)$, and $C'(10,12)$. Which transformation maps $\triangle ABC$ onto $\triangle A'B'C'$?

A. $(x, y) \longrightarrow (3x, 3y + 3)$

B. $(x, y) \longrightarrow (3x, 3y - 3)$

C. $(x, y) \longrightarrow (4x + 10, 4y + 8)$

D. $(x, y) \longrightarrow (4x - 10, 4y - 8)$

8. Propane is stored in a cylindrical tank with a diameter of 15 inches and a height of 48 inches. Which equation could be used to determine the radius of a spherical tank with the same volume?

A. $\pi (15)^2 (48) = \frac{4}{3}\pi r^3$

B. $\pi \left(\frac{15}{2}\right)^2 (48) = \frac{4}{3}\pi r^3$

C. $2\pi \left(\frac{15}{2}\right)^2 + \pi(15)(48) = 4\pi r^2$

D. $2\pi (15)^2 + \pi(15)(48) = 4\pi r^2$

9. On a coordinate plane, $\triangle ABC$ has vertices at $A(3, 6)$, $B(12, 6)$, and $C(12, 1)$. Which statements are true?
Select **all** that apply.

Pick up to 6 answers.

A. $\triangle ABC$ is a right triangle.

B. $\triangle ABC$ is an equilateral triangle.

C. $\triangle ABC$ is an isosceles triangle.

D. $\triangle ABC$ is a scalene triangle.

E. $\angle A$ and $\angle C$ are complementary.

F. $\angle A$ and $\angle C$ are supplementary.

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10. Lucy wants to approximate the area of a pond that is roughly circular. She knows the distances given.
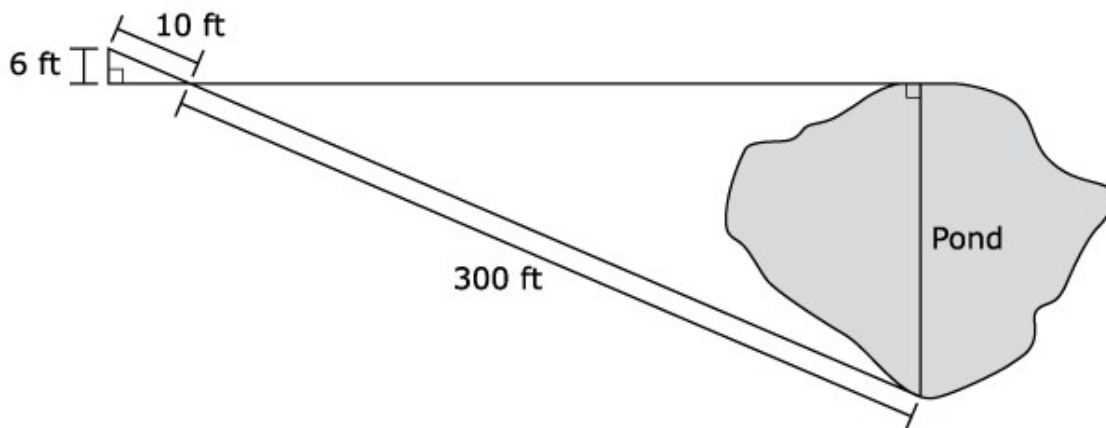
Which is the closest approximation of the surface area of the pond?

A. $25{,}434$ ft^2

B. $101{,}736$ ft^2

C. $196{,}250$ ft^2

D. $785{,}000$ ft^2

11. A construction company is hired to resurface a straight section of road.

- The section is 100 yards long and 18 feet wide.
- The company's truck can haul 250 cubic feet of gravel per load.

What is the minimum number of truckloads required to completely cover the section of road to a depth of 6 inches?

A. 3

B. 4

C. 10

D. 11

12. Dante rides his bicycle due west at 10 miles per hour. Annie rides her bicycle due north at 12.5 miles per hour. If they both leave Annie's house at the same time, approximately how far apart, in miles, are they after 4 hours?

    A. 16

    B. 23

    C. 64

    D. 90

13. A right triangular prism and a rectangular prism are shown. Each prism has a height of h inches and a cross-section that is parallel to its base. The length and width of the rectangular cross-section are given.
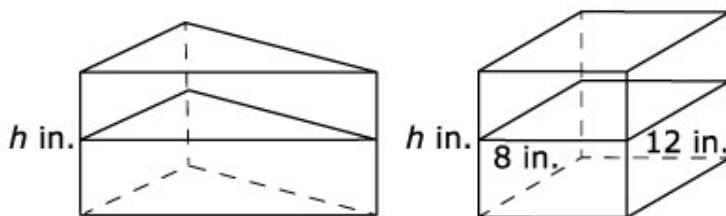
    If the volumes of the two solids are equal, which pair of measurements are possible lengths of the legs of the right-triangular cross-section?

    A. 4 in. and 6 in.

    B. 6 in. and 8 in.

    C. 8 in. and 12 in.

    D. 12 in. and 16 in.

14. Triangle ABC is shown on a coordinate plane.
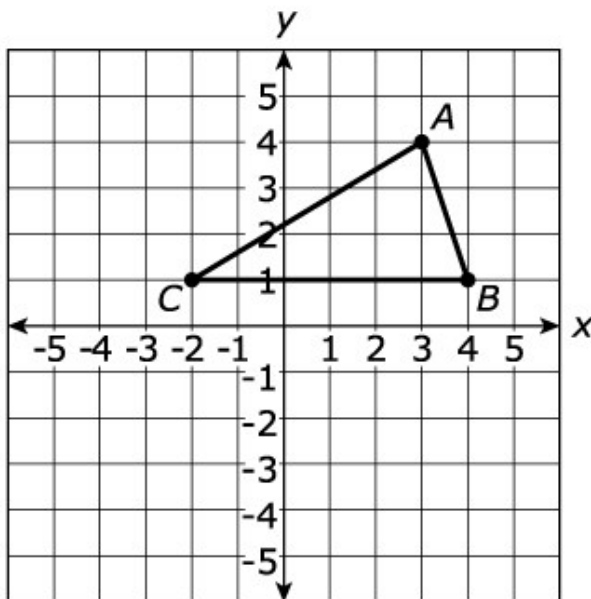
Which statement is true?
Select **all** that apply.

Pick up to 5 answers.

A. If $\overline{AD}$ is the altitude from A to $\overline{BC}$, the coordinates of D are $(1, 3)$.

B. The perimeter of $\triangle ABC$ is about 15 units.

C. The length of the longest side of the triangle is about 5.83 units.

D. The area of the triangle is 9 square units.

E. The length of the shortest side of the triangle is about 3.16 units.

15. The following statements describe triangles ABC and PQR.

For $\triangle ABC$: $AC = 2$, $AB = 4$, and $BC = 5$.
For $\triangle PQR$: $QR = 7.5$, $PR = 3$, and $PQ = 6$.
Which statement explains why $\triangle ABC$ and $\triangle PQR$ are either similar or not similar?

A. $\triangle ABC$ and $\triangle PQR$ are not similar because $\dfrac{AC}{QR} \neq \dfrac{AB}{PR}$.

B. $\triangle ABC$ and $\triangle PQR$ are similar because $\dfrac{AC}{PR} = \dfrac{PQ}{AB} = \dfrac{BC}{QR}$.

C. $\triangle ABC$ and $\triangle PQR$ are similar because $\dfrac{AB}{PQ} = \dfrac{BC}{QR}$.

D. $\triangle ABC$ and $\triangle PQR$ are similar because $\dfrac{AC}{PR} = \dfrac{BC}{QR} = \dfrac{AB}{PQ}$.

16. What is the equation of the line parallel to the line with equation $y = -\dfrac{3}{4}x - 5$ and passing through the point $(8, -3)$?
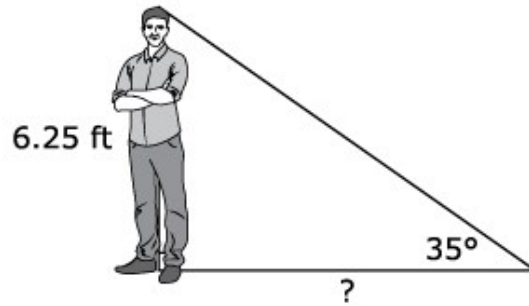
A. $y = -\dfrac{3}{4}x + 3$

B. $y = \dfrac{4}{3}x - 5$

C. $y = -\dfrac{3}{4}x - 3$

D. $y = \dfrac{4}{3}x - \dfrac{41}{3}$

17. Lorenzo is 6 feet, 3 inches in height. He looks at his shadow when the angle of elevation of the sun is $35°$.

6.25 ft

35°

?

What is the approximate length of his shadow?

A. 4 feet, 5 inches

B. 7 feet, 7 inches

C. 8 feet, 11 inches

D. 10 feet, 11 inches

18. The coordinates of the endpoints of $\overline{AB}$ are given.

$A(7, 6)$ and $B(-5, -6)$

Point K is located on $\overline{AB}$ so that $\frac{AK}{KB} = \frac{2}{1}$. What is the x-coordinate of point K?

A. -2

B. -1

C. 1

D. 3

19. Three points of rectangle $ABCD$ are shown on a coordinate plane.
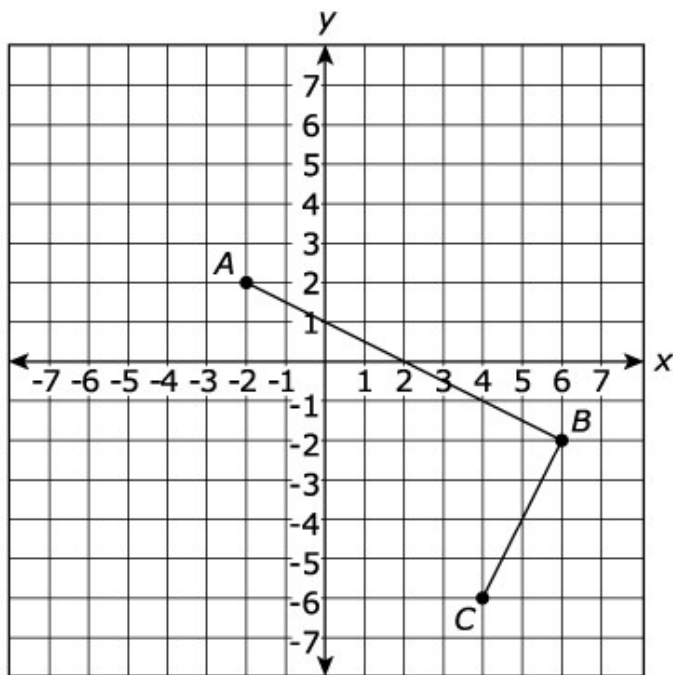
Which statement is true? Select **all** that apply.

Pick up to 5 answers.

A. The coordinates of D are $(-4, -2)$.

B. The perimeter of rectangle $ABCD$ is about 13.41 units.

C. The length of $\overline{CD}$ is about 8.94 units.

D. The area of the rectangle is about 40 square units.
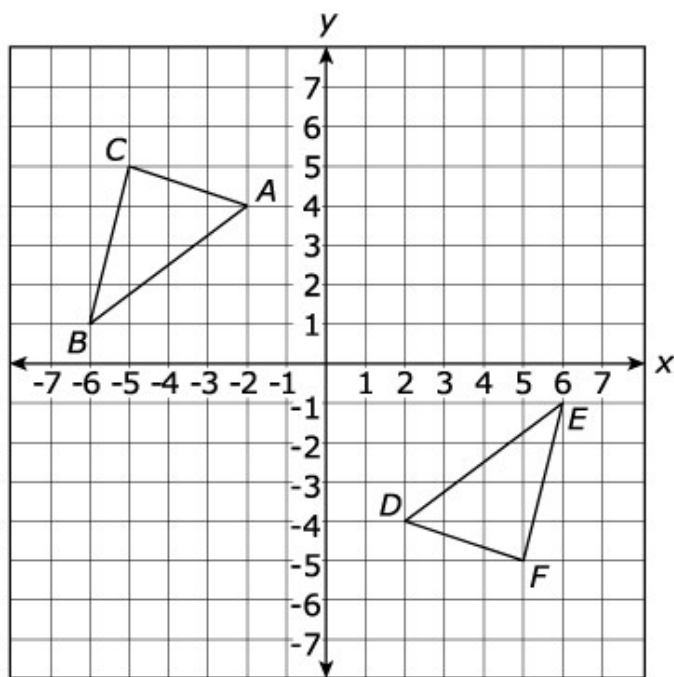
E. The length of $\overline{AD}$ is about 4.47 units.

20. James and Padma are on opposite sides of a 100-ft-wide canyon. James sees a bear at an angle of depression of 45°. Padma sees the same bear at an angle of depression of 65°.
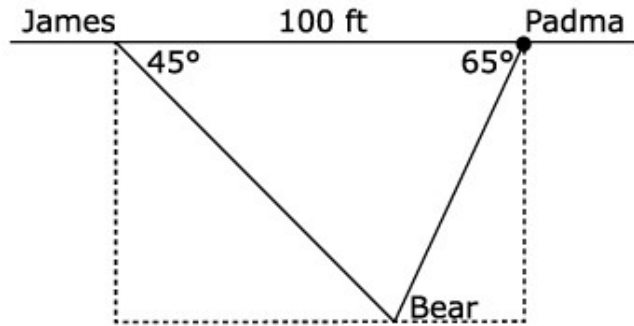
What is the approximate distance, in feet, between Padma and the bear?

A. 21.2 ft

B. 75.2 ft

C. 96.4 ft

D. 171.6 ft

21. Which transformation proves $\triangle ABC \cong \triangle DEF$?

A. reflection of $\triangle ABC$ over the line $y = x$

B. translation of $\triangle ABC$ 7 units right and 9 units down

C. rotation of $\triangle ABC$ 90° clockwise, centered at the origin

D. reflection of $\triangle ABC$ over the y-axis and then over the x-axis