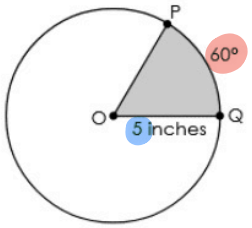
Question 1

Circle O is shown, where $m\overset{\frown}{PQ} = 60°$ and $OQ = 5$ inches.



Which expression represents the area, in square inches, of the shaded sector?

Ⓐ $\frac{60}{360}\pi(5)^2$

Ⓑ $\frac{60}{360}\pi(10)^2$

Ⓒ $\frac{60}{180}\pi(5)^2$

Ⓓ $\frac{60}{180}\pi(10)^2$

Entire Circle

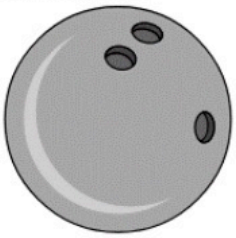
$A = \frac{m\angle C}{360} \cdot \pi r^2$

$A = \frac{60}{360} \cdot \pi(5)^2$

Substitution

Question 2

Match each real-life object to the geometric figure that **best** models it.

	Cylinder	Cone	Sphere
Bowling Ball 	☐	☐	☑
Pencil Eraser 	☑	☐	☐
Melon 	☐	☐	☑

Question 5

The probability of event A is 0.6. The probability of event B is 0.7.

A and B are independent events.

What is the probability of A and B?

$A \cap B$

INDY

$P(A \text{ and } B) = P(A) \cdot P(B)$

$= (0.6) \cdot (0.7)$

$= 0.42$

OR

$P(A \cap B) = P(A) \cdot P(B)$

$= \frac{6}{10} \cdot \frac{7}{10}$

$= \frac{42}{100}$

Question 6

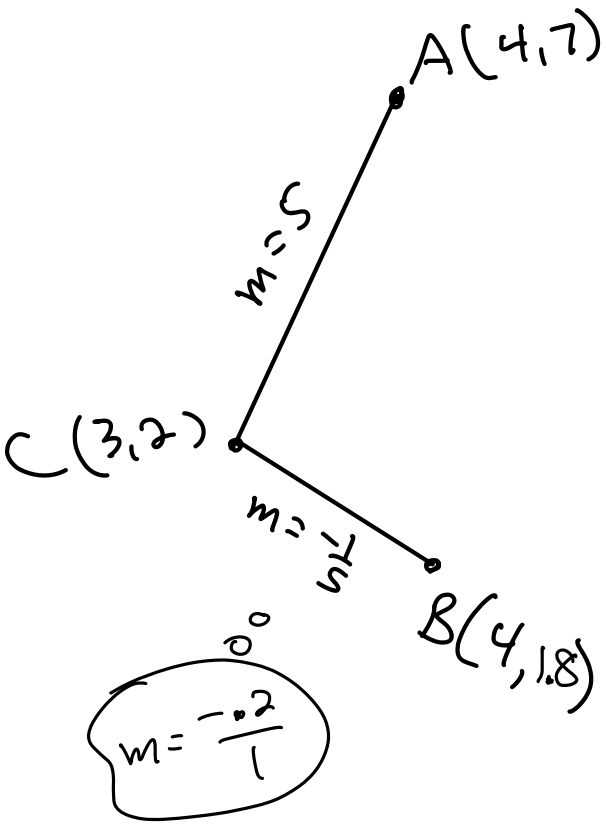
Triangle ABC, with the following characteristics, is placed on the coordinate plane.

- $\overline{AB}$ is on a vertical line.
- $\angle C$ is a right angle.
- Point C is located at (3, 2).
- The slope of $\overline{AC}$ is 5.

What are possible coordinates for points A and B?

A (4 , 7)

B (4 , 1.8)

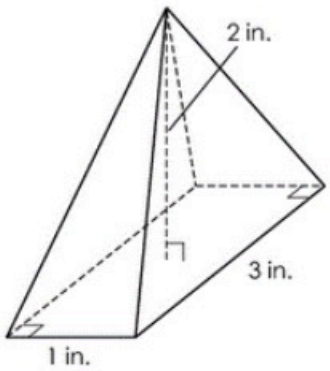


Since A and B are on same vertical line, they have same x-value.

∴ we need to use slope so we go same distance to the right.

Question 7

Iris created a pyramid-shaped figurine out of solid aluminum with the dimensions shown.



Iris sells all of her figurines for $7.50 per cubic inch.

What is the price of this figurine?

$ 15

① $V = \frac{1}{3} A_{base} \cdot height$

$= \frac{1}{3} \cdot 1 \cdot 3 \cdot 2$

$V = 2 \text{ in}^3$

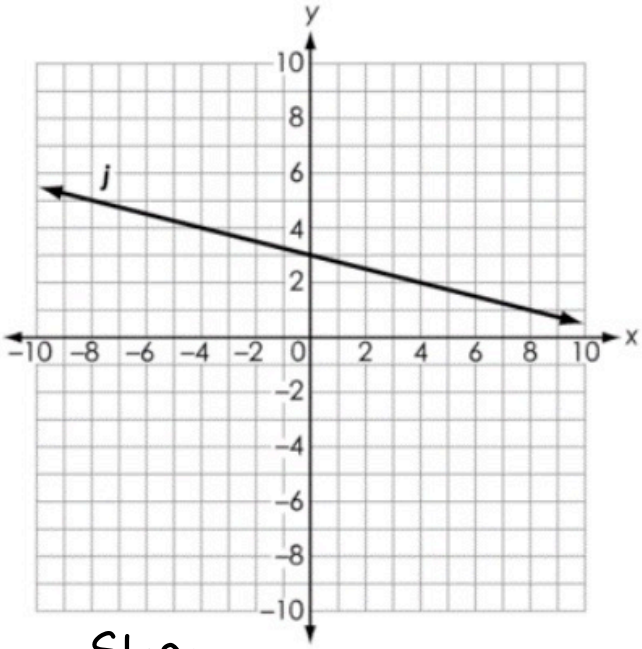
② $Price = \$7.50 \cdot Volume$

$= \$7.50 \cdot 2$

$Price = \$15$

Question 9

Nasir graphs line j on the coordinate plane as shown.



Same Slope

He dilates j by a scale factor of 3 about point P to create line k. Line j and line k coincide.

This means j and k are same line

What is a possible ordered pair for point P?

(0 , 3)

Choose Any point on line j.

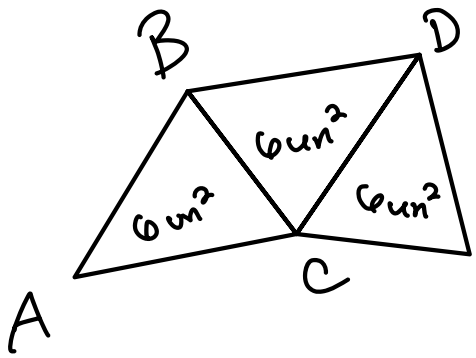
Question 11

Olivia creates a logo made up of three triangles. She constructs $\triangle ABC$ with an area of 6 square units.

- She reflects $\triangle ABC$ across $\overline{BC}$ to form $\triangle DBC$.
- She then reflects $\triangle DBC$ across $\overline{DC}$ to form $\triangle DEC$.

What is the total area, in square units, of Olivia's logo?

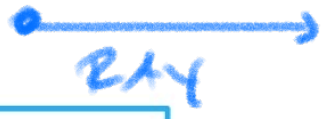
18 *square units*



produce congruent figures

Reflections are isometries

Question 16



Which statement most accurately defines a ray?

Ⓐ all points of a line that are on either side of a fixed point

Line

Ⓑ all points of a line that are on one side of a fixed point including the fixed point

ray

Ⓒ all points of a line that are between two fixed points of the line

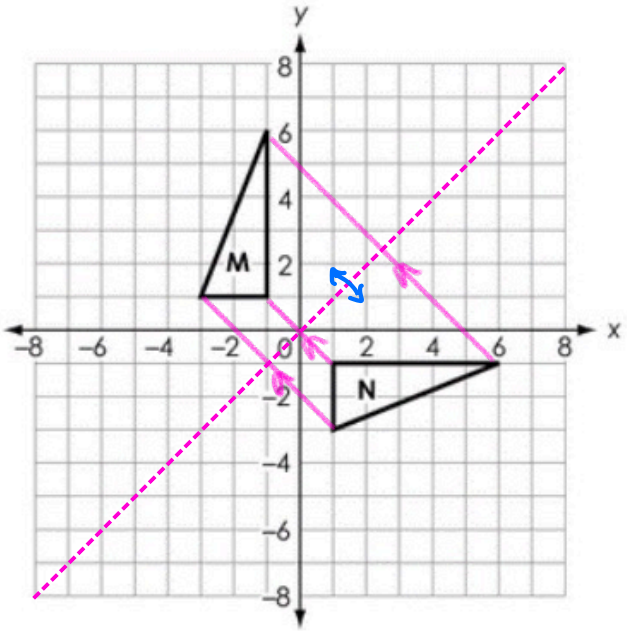
?

Ⓓ all points of a line that are between two fixed points of the line including the two fixed points

Segment

Question 18

A transformation is performed on triangle M to create triangle N, as shown.



Which transformation was performed?

Ⓐ a reflection across the line $y = -x$

Ⓑ a reflection across the line $y = x$

Ⓒ a clockwise rotation of 180° about the origin

Ⓓ a clockwise rotation of 270° about the origin

orientation changed ∴ reflection.

Question 27

A brick has a mass of 2,022.75 grams and a volume of 1,064.5 cubic centimeters.

What is the density of the brick, in grams per cubic centimeter $\left(\frac{g}{cm^3}\right)$? Round your answer to the nearest tenth.

one decimal

$\frac{2022.75}{1064.5} \approx 1.9$

$\frac{2022.75}{1064.5}$ $\frac{g}{cm^3}$

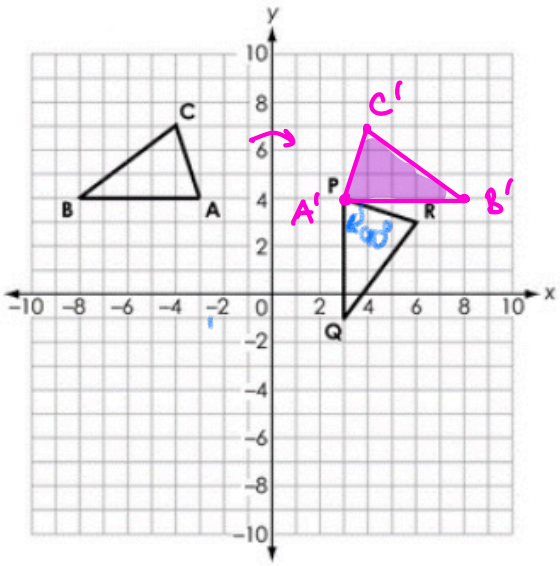
$$\text{Density} = \frac{\text{grams}}{cm^3}$$

$$\text{Density} = \frac{2022.75}{1064.5}$$

The State will accept this answer

Question 28

Triangles ABC and PQR are shown on the coordinate grid.



Robby wants to show that the two triangles are congruent.

Which sequence of transformations can Robby apply to triangle ABC to show that it is congruent to triangle PQR?

Ⓐ a reflection of triangle ABC across the *y*-axis, then a translation of the image 5 units down Too far down

Ⓑ a rotation of triangle ABC 90° clockwise about point A, then a reflection of the image across the *x*-axis ?? wrong

Ⓒ a rotation of triangle ABC 90° clockwise about point A, then a translation of the image 6 units to the right no reflect

Ⓓ a reflection of triangle ABC across the *y*-axis, then a rotation of the image 90° clockwise about the image of point A

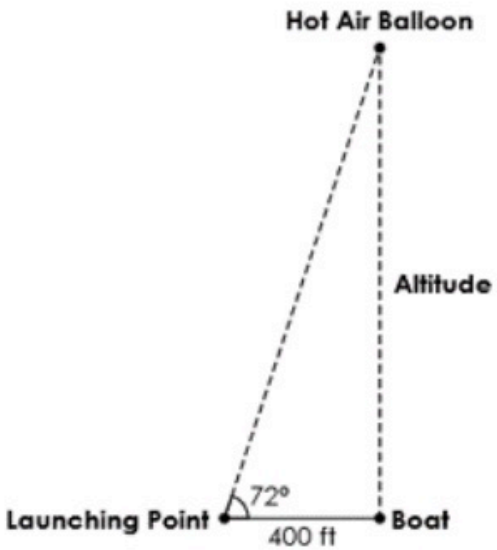
orientation changed ∴ reflection

Question 29

A hot air balloon is launched and drifts over a boat.

- The balloon's altitude increases at a constant rate.
- The balloon is directly above a boat 400 feet (ft) away from the launching point 5 minutes after it is launched.
- The angle of elevation is 72°.

A figure describing the situation is shown.



What is the change in the altitude, in feet, of the hot air balloon each minute? Round your answer to the nearest foot.

246 feet

① At 0 minutes the balloon's height is 0 feet

② At 5 minutes, the balloon's height is 1231.07 feet

③ $\tan 72° = \frac{\text{height}}{400}$

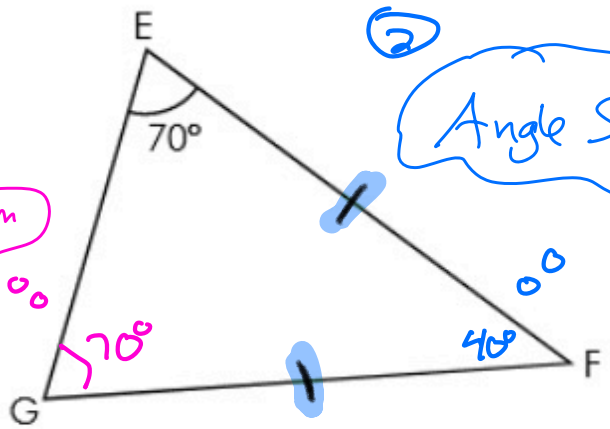
$400 \tan(72°) = \text{height}$

$1231.07 \approx h$

④ $\frac{1231.07 \text{ feet}}{5 \text{ min}} = \frac{246 \text{ ft}}{1 \text{ min}}$

Question 30

Triangle EFG is shown, where EF = GF.



What is the measure of ∠EFG?

Ⓐ 70°

Ⓑ 55°

Ⓒ 45°

Ⓓ 40°

Question 31

Events A and B are independent.

- $P(B) = 0.6$
- $P(A \text{ and } B) = 0.3$

What is $P(A)$?

0.5

$P(A \text{ and } B) = P(A) \cdot P(B)$

$0.3 = P(A) \cdot 0.6$

$\frac{0.3}{0.6} = P(A)$ Good Answer

$0.5 = P(A)$ Good Answer

Question 36

This item has **two** parts.

A high school teacher surveyed 700 junior and senior students to see whether they preferred biology or chemistry.

- Out of all the juniors surveyed, 35% said they preferred chemistry.
- Out of all the students surveyed, 56% said they preferred biology.

① $340(.35) = 119$

② $700(.56) = 392$

Part A. Complete the two-way table that shows how many junior and senior students preferred each science course.

	Biology	Chemistry	Total
Juniors	221	119 ①	340
Seniors	171	189	360
Total	② 392	308	700

Part B. What is the **exact** probability that a student is a senior given that the student preferred biology?

$\frac{171}{392}$

$$P(\text{Senior} \mid \text{biology}) = \frac{171}{392}$$

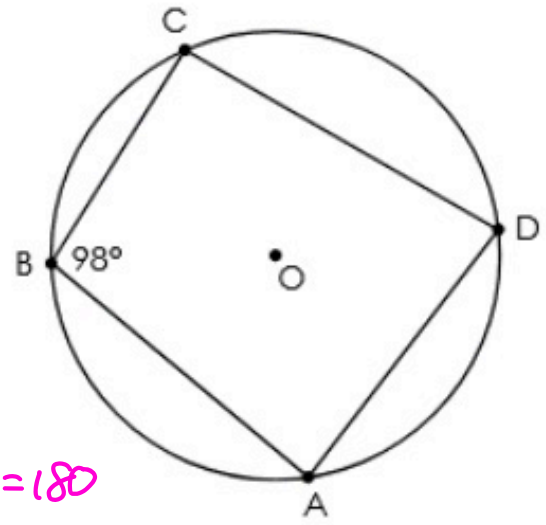
Question 37

Select the boxes to identify whether each statement is always, sometimes, or never true.

	Always	Sometimes	Never
A square has four right angles.	☑	☐	☐
A square has two pairs of parallel sides.	☑	☐	☐
A parallelogram has four congruent sides.	☐	☑	☐
A parallelogram has four right angles.	☐	☑	☐
A parallelogram has two pairs of congruent opposite sides.	☑	☐	☐

Question 46

Quadrilateral ABCD is inscribed in circle O, as shown.



$98 + m\angle D = 180$

What is the measure, in degrees, of $\angle CDA$?

82 degrees

Cyclic QUAD ∴ opposite angles are supplementary.

Question 47

What is the slope of a line that is perpendicular to the graph of $y = \frac{5}{4}x - \frac{3}{2}$?

$m = \frac{5}{4}$ $\therefore$ $\perp m = \frac{-4}{5}$

(A) $-\frac{4}{5}$

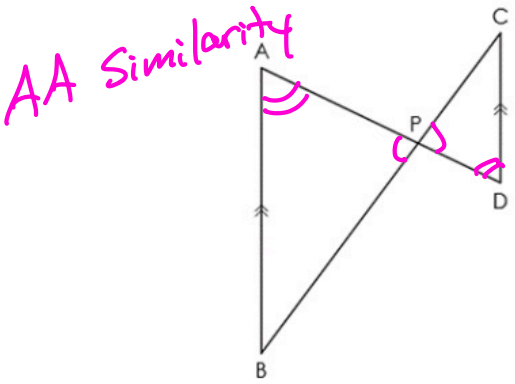
(B) $-\frac{5}{4}$

(C) $\frac{4}{5}$

(D) $\frac{5}{4}$

Question 48

A figure is shown, where $\overline{AB} \parallel \overline{CD}$.



AA Similarity

Complete the statement to describe the relationship between the two triangles.

Triangle APB is Similar to triangle DPC because triangle APB is a [ ] of triangle DPC.

rotation & Dilation

Drop Down Choices

Triangle APB is [ ] to triangle DPC because triangle

- similar
- not similar

APB is a [ ] of triangle DPC.

- rotation and a dilation ✓
- rotation and a reflection ✗
- translation and a dilation ✗
- reflection and a translation ✗

Question 49

A student flips a fair coin twice and is surprised the result is heads both times.

Which sentence correctly describes the relationship between the two events?

(A) The two events are dependent because the result of the first flip changes the probability of the second flip being heads.

(B) The two events are dependent because the result of the first flip does not change the probability of the second flip being heads.

(C) The two events are independent because the result of the first flip changes the probability of the second flip being heads.

(D) The two events are independent because the result of the first flip does not change the probability of the second flip being heads.