Geometry Benchmark AP1 Name: _____ Period: _____

1)

If $\overline{PQ} \cong \overline{QR}$, with $PQ = 3x - 16$, $QR = 2x + 12$, $RS = x + 8$, find the length of PS.

- ○ 18
- ○ 28
- ○ 68
- ○ 172

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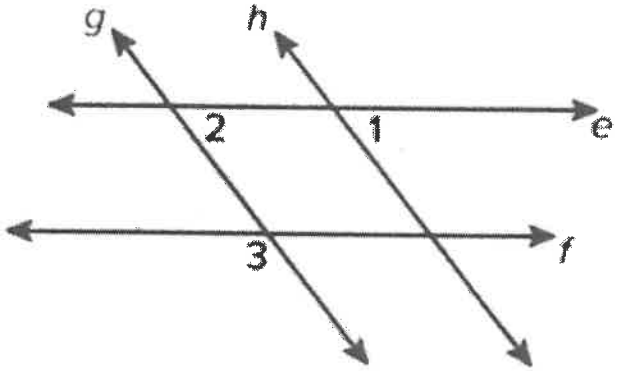
2)

In the figure, $g \parallel h$ and $e \parallel f$, $m\angle 1 = (2x + 3)^\circ$ and $m\angle 3 = (5x + 2)^\circ$, What is the $m\angle 1$?



- ○ 25°
- ○ 53°
- ○ 128°
- ○ 180°

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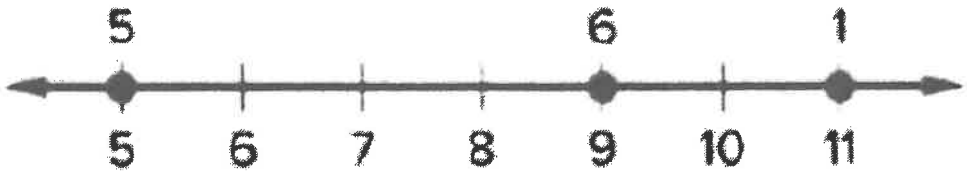
3)

Point C is the midpoint of AB and point B is between points A and D. If $AD = 13$ and $BD = 7$, what is CD?

- ○ 3
- ○ 6
- ○ 10
- ○ 20

4

Weights of points on a number line are shown.

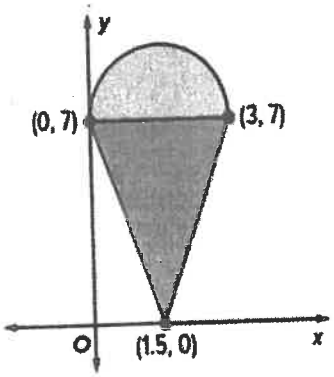


What is the weighted average of the points?

- ○ 7.5
- ○ 7.9
- ○ 8.3
- ○ 30

#5

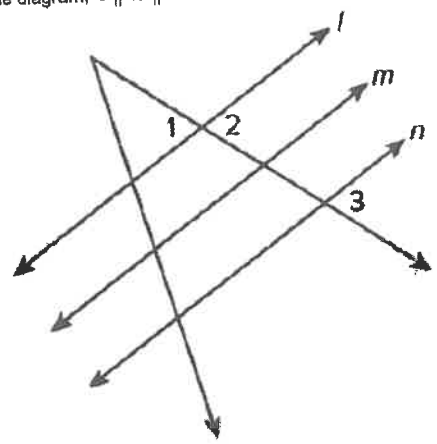
An ice cream shop has a sign that looks like an ice cream cone. It is composed of a cone with a semicircle on top as shown in the figure. Find the perimeter of the sign, given that one unit on the coordinate grid represents 1 foot. Round to the nearest hundredth, if necessary. Use 3.14 for π.



- ○ $7.16ft$
- ○ $14.32ft$
- ○ $25.31ft$
- ○ $21.98ft$

6

In the diagram, $l \parallel n \parallel m$.



Statement	Reason
1. $\ell \parallel n$	1. Given
2. $\angle 3 \cong \angle 2$	2. ?
3. $\angle 2 \cong \angle 1$	3. Vertical Angles Theorem
4. $\angle 3 \cong \angle 1$	4. Transitive Property of Congruence

Which theorem justifies Step 2?

- ○ Vertical Angles Theorem
- ○ Corresponding Angles Theorem
- ○ Alternate Interior Angles Theorem
- ○ Alternate Exterior Angles Theorem

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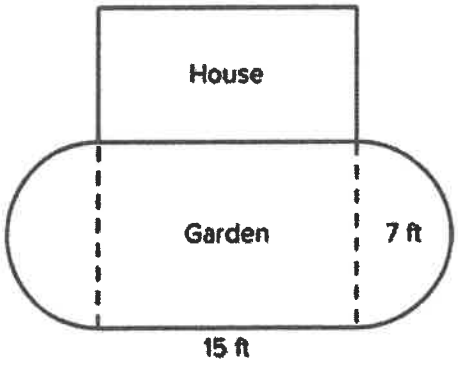
7. Fill in the blanks using the available answer choices.

A garden is composed of a rectangle and semicircles on each side. The house is on one side of the garden as shown. The homeowner wants to cover the garden in mulch. One bag of mulch will cover 12 square feet and cost $4.



Indicate whether each statement is true or false.

The garden has an area over 100 square feet. [▾].

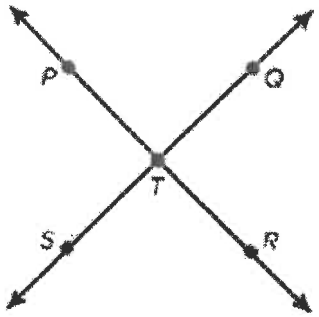
The homeowner will need 10 or fewer bags of mulch. [▾].

The homeowner can cover the garden in mulch for less than $50. [▾].

8

Two lines intersect at a point as shown in the figure.

What is the name of the angle formed from $\overrightarrow{TP}$ and $\overrightarrow{TS}$? What is the vertex of this angle?



- ○ $\angle TPS$: $pointT$
- ○ $\angle PST$: $pointS$
- ○ $\angle PTS$: $pointT$
- ○ $\angle STP$: $pointS$

9

Which of the following transformations is a rigid motion? Select all that apply.

- ☐ $(x,y) \rightarrow (x-1, y-7)$
- ☐ $(x,y) \rightarrow (-y, -x)$
- ☐ $(x,y) \rightarrow (x+1, 2y)$
- ☐ $(x,y) \rightarrow (4x, y)$
- ☐ $(x,y) \rightarrow (x+4, y-3)$

10

What is the contrapositive of the statement

"right triangles have a right angle?"

- ○ If a triangle has a right angle, then it is a right triangle.
- ○ If a triangle is a right triangle, then it has a right angle.
- ○ If a triangle is not a right triangle, then it does not have a right angle.
- ○ If a triangle does not have a right angle, then it is not a right triangle.

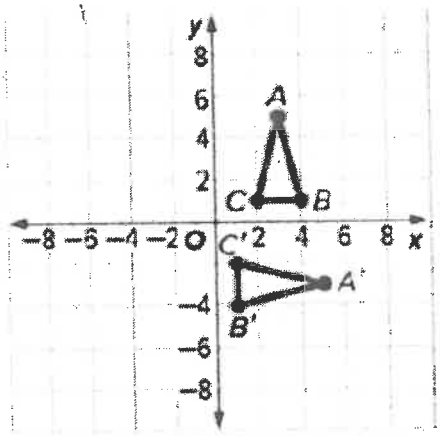
11

Which types of triangles can always be used as a counterexample to the statement *"all angles in a triangle are acute"*? Select all that apply.

- [ ] Acute
- [ ] Equilateral
- [ ] Isosceles
- [ ] Obtuse
- [ ] Right
- [ ] Scalene

12

Triangle ABC goes through a transformation that results in triangle $A'B'C'$ as shown.

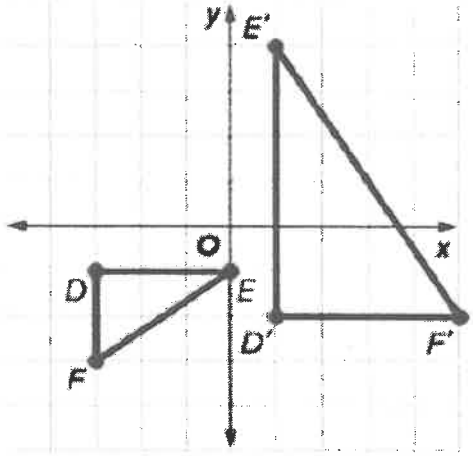


Which coordinate notation correctly describes a transformation that maps the triangle ABC to triangle $A'B'C'$?

- ○ The rotation $(x,y) \rightarrow (-x, -y)$
- ○ The translation $(x,y) \rightarrow (x-1, y-2)$
- ○ The rotation $(x,y) \rightarrow (y, -x)$
- ○ The translation $(x,y) \rightarrow (x+2, y-8)$

13

Three transformations are applied to ΔDEF to obtain $\Delta D'E'F'$.



Drag the transformations to arrange them in the order they are applied to $\Delta D'E'F'$.

order #1-3 answers below

Answer
translation up 2 units
dilation by a factor of 2 about the origin
rotation 90° clockwise about the origin

14

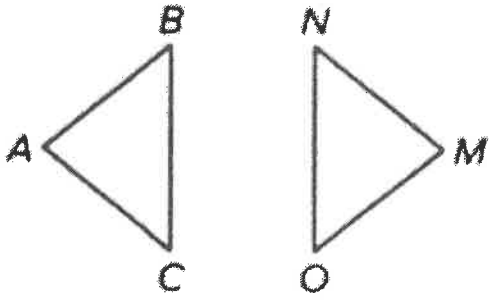
Which of the following transformations preserves angle measures? Select all that apply.

- ☐ $(x,y) \rightarrow (2x,2y)$
- ☐ $(x,y) \rightarrow (-3y,-x)$
- ☐ $(x,y) \rightarrow (x+1,y-6)$
- ☐ $(x,y) \rightarrow (x-8,7y)$
- ☐ $(x,y) \rightarrow (x,-y)$

15

Fill in the blanks using the available answer choices.

Triangle ABC is rotated 180° to form $\triangle MON$ as shown.



Choose one answer

- MON
- NMO
- ONM

Complete the statement.

The measure of $\angle BCA$ is equal to the measure of $\angle$ [ ]

Choose one answer

- is not a rigid motion
- preserves angles but not distances
- preserves distances

because the two triangles are congruent. The triangles are congruent because a rotation [ ].