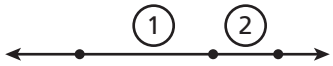
Name _____ Date _____ Class _____

GRADE 10

Focus on Sunshine State Standards: Benchmark Tests

MA.912.G.8.4 Benchmark Pre-Test (Multiple Choice)

1. Denise scattered n points on a line in such a way that no two of them landed on top of each other. Three points determine two segments as shown below.



Following this pattern, how many segments are determined by n points?

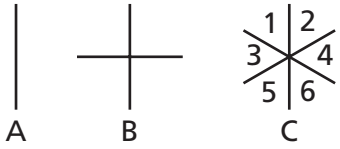
A. $n^2 - 7$

B. $n - 1$

C. $n + 1$

D. $n^2 + 1$

2. Each of diagrams A, B, and C consists of line segments. In diagram C, 6 regions of the plane are determined by 3 lines.



Following this pattern, how many regions are determined by n line segments?

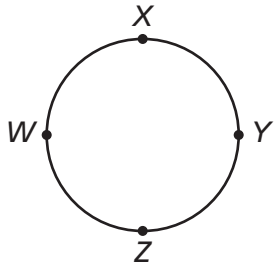
F. $n - 1$

G. $n + 1$

H. $2n$

I. $2n + 1$

3. Ronald placed n points equally spaced around a circle that has radius r. The diagram below shows 4 points equally spaced around a circle.



Which of the following can you use to find the distance along the circle between two consecutive points? (Remember $C = 2\pi r$.)

A. $2n\pi r$

B. $n\pi r$

C. $\frac{2\pi r}{n}$

D. $\frac{2\pi r}{4}$

4. Which justifies the statement that all equilateral triangles are similar?

F. The corresponding angles are equal and the corresponding sides are proportional.

G. The corresponding angles are equal and the corresponding sides are congruent.

H. Draw two equilateral triangles and compare lengths.

I. Try to make two equilateral triangles that are not similar.

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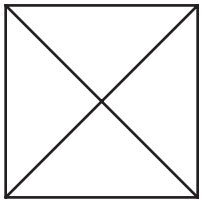
5. Jonathan conjectures that all of the line segments joining opposite vertices of a regular polygon with an even number of sides have the same length. The diagram below shows the situation for a square.



Which of the following approaches is the most helpful to show others that his conjecture is true?

A. Sketch a square and a regular hexagon. Then draw a few line segments joining opposite vertices. Measure the line segments in each figure.

B. Draw a square and a regular hexagon using computer software. Then draw a few line segments joining opposite vertices. Have the computer measure the line segments.

C. Draw several regular hexagons of varying sizes using computer software. Then draw a few line segments joining opposite vertices. Have the computer measure the line segments.

D. Draw several regular polygons of varying sizes and different numbers of sides using computer software. Then draw all the line segments joining opposite vertices. Have the computer measure the line segments.

6. Ricki wants to show that if a triangle is an obtuse triangle with the shorter sides a and b units long and the longest side c units long, then $a^2 + b^2 < c^2$. Which of the following measurements will produce a drawing of a triangle that supports her claim?

F. $a = 3$, $b = 4$, and $c = 5$

G. $a = 3$, $b = 4$, and $c = 7$

H. $a = 3$, $b = 4$, and $c = 2$

I. $a = 3$, $b = 3$, and $c = 3\sqrt{2}$

7. Frank claimed: If you start with $P(x, y)$ in the coordinate plane, reflect it across the y-axis, then repeat this process using the images, then after n successive reflections, the image of $P(x, y)$ has the coordinates stated below.

$$((-1)^n x, y)$$

Which can he use to make a convincing argument that the conjecture is true?

A. Graph $P(3, 2)$ and its reflection across the y-axis.

B. Graph $P(x, y)$ and its reflection across the y-axis.

C. Make a table showing the successive images of $P(3, 2)$ for $n = 1, 2$, and 3.

D. Make a table showing the successive images of $P(x, y)$ for $n = 1, 2, 3$, and 4 and make an illustration showing the process for these values of n.