

Geometry Common Core Regents Exam June 2018

Exam: Begins on page 1 in your booklet or you can download it:

<https://www.nysedregents.org/geometryre/618/geom62018-exam.pdf>

Complete the following: #1-6, 11-14, 19, 21, 23, 26, 27, 29, 32, and 33

Please attempt to do the questions BEFORE looking at the hints below. If you're still unable to complete the question after reading the hints, look at the video answer key: <https://www.youtube.com/watch?v=ripW1VVHX5o>

After watching the video answer key, you should attempt to do the question YOURSELF before moving on. Keep a list of questions you are unable to complete. Feel free to email me for further assistance.

Hints

#1 - A rotation is a rigid motion. A rigid motion preserves size, shape (angle measure), and orientation. The pre-image maps onto an image.

#2 – Some of the theorems below might be used to answer the question.

If two parallel lines are cut by a transversal, the alternate interior angles are congruent.

$$\angle A \cong \angle AED \text{ and } \angle B \cong \angle BDE$$

Opposite angles formed by intersecting lines are vertical angles. Vertical angles are congruent.

$$\angle ACB \cong \angle ECD$$

Two adjacent angles forming a straight angle form a linear pair.

$$m\angle FEC + m\angle DEC = 180$$

An exterior angle equals the sum of the two remote interior angles.

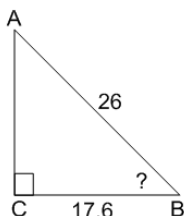
$$m\angle BCE = m\angle A + m\angle B$$

#4 – These are similar triangles because two angles in one triangle are congruent to two corresponding angles in the other triangle – you have the vertical angles and $m\angle ADC$ and $m\angle FBC$ both equal 65 degrees.

Corresponding sides of similar triangles are proportional – set up your proportion.

#5 - With a dilation, the shape remains the same, the size changes (NOT preserved). The question is asking for the perimeter, first find the image of RS, then find the perimeter.

#6 - Draw a diagram first (remember, the hypotenuse is opposite the right angle). Then use trig ratios to find the angle measure (use your inverse trig keys).



#11 - The Side-Splitter Theorem states if a segment is parallel to one side of a triangle, it divides the other two sides proportionally. Also forms two similar triangles. $\triangle ABC \sim \triangle ADE$.

#12 - The slopes of perpendicular lines are negative reciprocals of each other. Once you have the slope and a point the line passes through, use the point-slope formula $(y - y_1) = m(x - x_1)$

#13 - Properties of a rhombus: it's a parallelogram PLUS

Diagonals are perpendicular.

Four congruent sides.

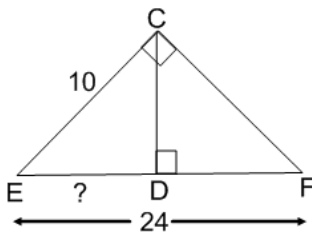
Diagonals bisect the angles.

#14 - Use graph paper, find the horizontal change and divide it by the number of parts needed (since the ratio is 2:3, you'll need to divide by 5). Then identify the point on the line dividing the segment into 2 parts and 3 parts.

#19 - Any rotation of 72 degrees ($360^\circ \div 5$) will map a regular polygon onto itself.

#21 - Use the side splitter theorem to first find the length of QT . QR equals $QT+TR$. Or you can use similar triangles to set up the appropriate proportion.

#23 - Draw the diagram. You should recognize Similar Right Triangles – use the mean proportional side theorem to solve (the length of the side is the geometric mean between the length of the entire hypotenuse and the portion of the hypotenuse adjacent to the side). To find the geometric mean of two numbers, you take the square root of the product of the two.



#26 - Dilate each of the vertices separately. Note the center of dilation is NOT at the origin. Remember the image of a dilated line segment is parallel to its pre-image.

#27 - Determine if the orientation has been preserved. If not, then you know one of the transformations must have been a reflection.

#29 - A median is drawn to the midpoint of the opposite side. Find the midpoint of \overline{AC} (by constructing its perpendicular bisector to identify the midpoint), then draw a line from B to the midpoint of \overline{AC} .

#32 - Using the distance formula, find the length of all three sides. An isosceles triangle has two congruent sides while an equilateral triangle has three congruent sides.

$$\text{distance} = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2} \quad \text{or} \quad \text{distance} = \sqrt{\Delta x^2 + \Delta y^2}$$

#33 - First find the length of \overline{ST} in $\triangle FTS$ using trig ratios. Then with the value of \overline{ST} in $\triangle CTS$ use trig ratios to find \overline{CT} . Remember, you can always use the law of sines in lieu of trig ratios if you prefer.