Geometry Common Core Regents Exam January 2018

Exam: This exam is NOT in your booklet, you can download it:
https://www.nysedregents.org/geometryre/118/geom12018-exam.pdf

Complete the following questions: 1-4, 6, 8 9, 13, 15, 17-20, 23, 26, 31, 34, 35

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 keys:
#1-12 https://www.youtube.com/watch?v=kNfHJJtJ7n0&feature=youtu.be
#13-24 https://www.youtube.com/watch?v=xS6rgCsAt3A&feature=youtu.be
#24-35 https://www.youtube.com/watch?v=apgcB2uBulQ&feature=youtu.be

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 rigid motion preserves size (distance) and shape (angle measure).
Therefore, $\angle A \cong \angle J,\ \angle B \cong \angle K,\ \angle C \cong \angle L,\ \angle D \cong \angle M$

#2 – Properties of parallelograms: opposite sides parallel, both pairs of opposite side congruent, diagonal bisect each other, opposite angles congruent, and consecutive angles are supplementary.

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

#4 – Identify the sides of the triangle with respect to the given angle (opposite, adjacent, hypotenuse), select the appropriate trig ratio (SOH CAH TOA) and solve for the missing value.

#6 To partition a line segment, use graph paper. Find the horizontal change between the segment's endpoints and divide it by the number of parts needed (since the ratio is 1:2, you'll need to divide by 3). Then identify the point on the line dividing the segment into 1 part and 2 parts.

#8 – If distance and angle measure are preserved, it's a rigid motion. A dilation does NOT preserve distance (size).

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

#13 - 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. $\Delta ABC \sim \Delta DEC$.

#17 – Because of the congruent vertical angles and the congruent right angles formed by the perpendicular lines, the two triangles are similar and hence the corresponding sides are proportional.

#18 – Helpful theorems: if two parallel lines are cut by a transversal, the alternate interior angles are congruent, angles opposite congruent sides of a triangle are congruent.

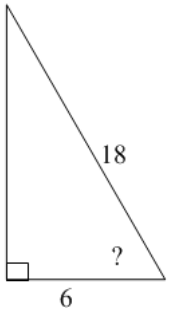
#19 – Think about properties unique to a rhombus NOT properties that all parallelograms have.

#20 - The slopes of perpendicular lines are negative reciprocals of each other. Put the equation into slope-intercept form ($y = mx + b$) to find the slope of the line. Once you have the slope and a point the line passes through, use the point-slope formula $(y - y_1) = m(x - x_1)$

#23 - 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 – Construct the perpendicular bisector of $\overline{AB}$, then draw line segments connecting the points at which the perpendicular bisector and the diameter intersect the circle.

#31 – Draw a diagram then identify the sides of the triangle with respect to the angle your asked to find (opposite, adjacent, hypotenuse), select the appropriate trig ratio (SOH CAH TOA) and use inverse trig function to find the angle measure.



#34 - Identify the sides of the triangle with respect to the given angle (opposite, adjacent, hypotenuse), select the appropriate trig ratio (SOH CAH TOA) and solve for the missing value.

#35 - Use the distance formula to find the lengths of the sides of the triangle – you need to have two congruent sides in order for the triangle to be isosceles.

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

To prove a parallelogram, show both pairs of opposite sides are congruent (you already have 3 of the lengths from the first part of the problem). OR you can show both pairs of opposite sides are parallel (have the same slope).