Simplify all answers and show your work!

1. Congruent triangles are the same __________ and have the same __________.

2. For corresponding angles or alternate interior/exterior angles to be congruent, a transversal must cross what kind of lines? ______________________

3. The sum of two supplementary angles is __________ degrees.

4. The sum of two complementary angles is __________ degrees.

5. What is the complement of a 38° angle?

6. What is the supplement of a 38° angle?

Use the figure to the right to answer problems 7 - 12. Assume that $CF \parallel GJ$.

7. List a pair of vertical angles. __________________________

8. If $\angle ADC = 76^\circ$ and $\angle DEP = 35^\circ$, find the measures of the following.
   a) $\angle ADE = \________$   b) $\angle EDP = \________$   c) $\angle CDP = \________$
   d) $\angle PIJ = \________$   e) $\angle PIH = \________$   f) $\angle PHI = \________$
   g) $\angle HPI = \________$   h) $\angle DPE = \________$   i) $\angle PEF = \________$

Fill in the blanks with corresponding, vertical, alternate exterior, alternate interior, complementary, or supplementary.

9. $\angle ADC$ and $\angle JIL$ are ____________________ angles.

10. $\angle DEP$ and $\angle PHI$ are ____________________ angles.

11. $\angle GHK$ and $\angle KHI$ are ____________________ angles.

12. $\angle HPI$ and $\angle DPE$ are ____________________ angles.

Given $\triangle ABC$ below where $\angle BCA = 31^\circ$ and $\angle ABC = 89^\circ$, answer problems 13 – 15.

13. Find $\angle BAC = \________$.    14. Which side is the longest? __________

15. Which side is the shortest? __________

16. Given the figure to the right where $\angle AED = \angle ADE = 2x$ and $\angle DEB = 8x$, find the following.
   a) $x = \________$   b) $\angle AED = \________$   c) $\angle ADE= \________$
   d) $\angle DEB= \________$   e) $\angle BAD= \________$
   f) $\angle BED= \________$   e) $\angle FEB= \________$

Determine whether or not it is possible to make a triangle having the given side lengths. (Yes or No)

17. 2, 5, 8 __________  18. 1.8, 3.2, 4.9 __________  19. 5, 5, 12 __________
20. The measure of \( \angle A \) is \((2x - 9)\text{o}\) and the measure of \( \angle B \) is \((6x + 3)\text{o}\). If angles A and B are complementary angles, find the following:

a) \( x = \) \[\_\_\_\_\_\_\_\_\_\_ \]

b) \( m \angle A = \) \[\_\_\_\_\_\_\_\_\_\_\_\] 

c) \( m \angle B = \) \[\_\_\_\_\_\_\_\_\_\_\]

21. A traffic cone (disregarding the square base) has a diameter of 36 cm and a perpendicular height of 70 cm. Since traffic cones are right circular cones, the perpendicular height bisects the diameter.

a) Find the slant height “s”.

b) If a reflective sleeve is placed over the entire surface of the cone, how many cm\(^2\) of reflective material will be needed to cover the cone?

c) If the square base of the cone is 3 cm wider than the circle all of the way around, how many cm\(^2\) of plastic will be needed to make the base?

22. A trailer on a truck is converted into a large fish tank. The trailer is in the shape of a rectangular solid. The dimensions of the trailer are 53 feet long by 102 inches wide by 110 inches tall.

a) What is the length of the trailer in inches?

b) If the bottom 8 inches of the trailer is filled with sand, what is the volume of the sand placed in the tank?

c) If the rest of the tank is filled up with water, how much water goes in the tank?

d) If there are 231 inches\(^3\) in one gallon, how many gallons of water are in the tank?

23. Determine which theorem – if any – proves congruence for the given triangles: SSS, SAS, ASA, AAS, HL, or none.

a) Show \( \triangle ABD \cong \triangle CBE \) if \( AB \cong CB \).

b) \[\text{Diagram of two congruent right triangles.}\]

c) \[\text{Diagram of two non-congruent triangles with one angle marked as 92 degrees.}\]