1. If $AD=2$, $AC=6$ and $BD=2$, what is the perimeter of $ABC$?

   \[ \text{By HL} \rightarrow BC = 6 \]

   \[ \text{Per. of } \triangle ABC = 6 + 6 + 4 = 16 \]

2. If $AD=24$, $BF=9$, and $DF=9$, then what is the value of $AB$?

   \[ \text{By HL} \rightarrow AB = 24 \]

3. If $m \angle YXW = 29^\circ$, $YW = 7$, and $WZ = 7$ what is $m \angle ZXY$?

   \[ \text{By HL, } \triangle YXW \cong \triangle ZXW, \]

   \[ \text{and by CPCTC, } \angle YXW \cong \angle ZXW. \]

   \[ \angle YXW + \angle ZXW = \frac{180^\circ}{2} \]

   \[ \rightarrow 29^\circ + 29^\circ = 58^\circ \]

4. If $CD=3$ and the perimeter of $ABC$ is 20, what is the perimeter of $ABE$?

   \[ \triangle ABE = \triangle ABC + \triangle ACE - 2x \]

   \[ = 20 + (2x+6)2x \]

   \[ = 20 + 6 = 26 \]

5. Points D, E and F are midpoints of the sides of $ABC$. The perpendicular bisector of $AB$ is $m$ and the perpendicular bisector of $BC$ is $n$. Lines $m$ and $n$ intersect at $T$. If $TA=6.6$, what is $TC$?

   \[ T \text{ is the circumcenter} \]

   \[ \rightarrow TA \text{ and } TC \text{ are radii.} \]

   \[ \because TA = TC \]

   \[ \therefore TC = 6.6 \]
6. Find EG. 

\[ DG = 10 \]
\[ BG = 30 \]

**By AAS, \triangle BDG \cong \triangle BCG,**

if DG is 10, EG is also 10.

7. Find EG.

![Diagram](image)

8. If XY=24, XZ=22 and JQ=9, find the radius of the circumscribed circle of XYZ.

\[ QY = \sqrt{9^2 + 12^2} \]
\[ = 15 \]

9. Where is the centroid of ABC?

**Centroid:** (1, 3)

![Graph](image)

10. What is the value of KL?

\[ LP = 2X \]
\[ KP = X \]

If LP = 13, KP = \( \frac{13}{2} \)

Then, KL = 13 + \( \frac{13}{2} \) = 19.5
11. Order the angles from smallest to largest.

\[ \angle G, \angle F, \angle H \]

12. Order the sides from smallest to largest.

\[ \overline{OP}, \overline{NP}, \overline{NO} \]

13. Can a triangle have side lengths 2, 7, 8?

\[ 2 + 7 > 8 \quad \checkmark \quad 2 + 8 > 7 \quad \checkmark \quad 7 + 8 > 2 \quad \checkmark \]

14. Can a triangle have side lengths 2, 3, 5?

\[ 2 + 3 \not> 5 \]

15. What is the range of lengths for the third side of a triangle if the other two sides are 12 and 4?

\[ 12 - 4 < x < 12 + 4 \rightarrow 8 < x < 16 \]

16. What is the range of lengths for the third side of a triangle if the other two sides are 21 and 12?

\[ 21 - 12 < x < 21 + 12 \rightarrow 9 < x < 33 \]

17. Draw a triangle below. Construct the circumcenter of the triangle.

\[ \text{1 bisector} \]

18. What are the special qualities of the 4 points of concurrency.

- **Circumcenter**
  - 1 bisector;
  - radii from center to vertices =
  - \[ \times \] bisectors, radii from center to sides =

- **Orthocenter**
  - altitudes intersect

- **Incenter**
  - medians (to vertices) intersect

- **Centroid**