# Lesson 5.7 Angle Relationships

When two lines intersect, they form angles that have special relationships.

Vertical angles are opposite angles that have the same measure.

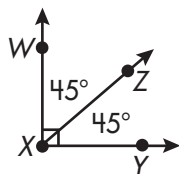**Supplementary** angles are two angles whose measures have a sum of 180°.

Complementary angles are two angles whose measures have a sum of 90°.

A **bisector** divides an angle into two angles of equal measure.
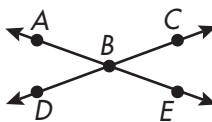
∠ABC and ∠DBE are vertical.

∠ABD and ∠DBE are supplementary.

∠WXZ and ∠ZXY are complementary.
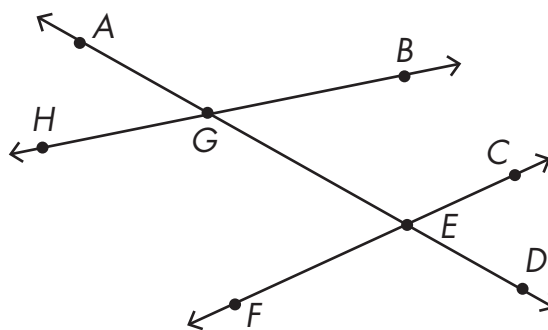
$\overrightarrow{XZ}$ is the bisector of ∠WXY.

Identify each pair of angles as *supplementary* or *vertical*.

1. ∠AGB and ∠HGE _____

2. ∠BGE and ∠HGE _____

3. ∠GEC and ∠CED _____

4. ∠GEC and ∠DEF _____

5. ∠AGH and ∠BGE _____

6. ∠GEF and ∠DEF _____

Solve each problem.

7. ∠A and ∠G are vertical angles. The measure of ∠A is 72°. What is the measure of ∠G?

_____

8. ∠Y and ∠Z are supplementary angles. The measure of ∠Y is 112°. What is the measure of ∠Z? _____

9. ∠A and ∠B are complementary angles. The measure of ∠A is 53°. What is the measure of ∠B? _____

10. ∠RST is bisected by ray SW. The measure of ∠WST is 30°, what is the measure of ∠RST? _____
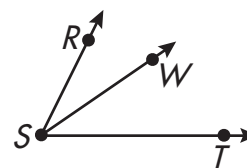
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Use the figure at the right to answer questions 1–6.

1. Name an angle that is vertical to ∠EHF. _____

2. Name an angle that is vertical to ∠EHM. _____

3. Name an angle that is supplementary to ∠IMJ. _____

4. Name the bisector of ∠HMK. _____

5. Name an angle that is vertical to ∠JMK. _____

6. Name an angle that is supplementary to ∠JMK. _____
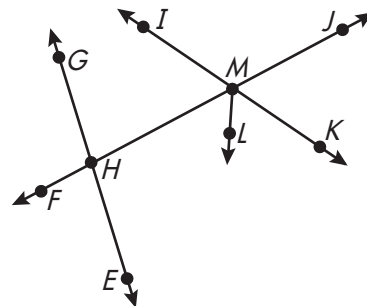
Use the figure at the right to answer questions 7–10.

7. Name an angle complementary to ∠BFC. _____

8. Name an angle complementary to ∠AFG. _____

9. Name an angle that is supplementary to ∠CFD. _____

10. Name an angle that is supplementary to ∠GFE. _____
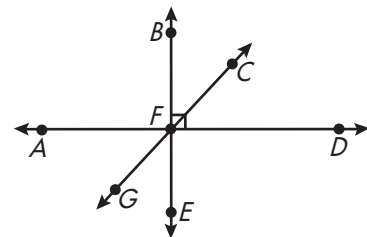
Solve.

11. ∠RST is supplementary to angle ∠PSO. The measure of ∠RST is 103°.

What is the measure of ∠PSO? _____

12. ∠MNO and ∠NOP are complementary. The measure of ∠NOP is 22°.

What is the measure of ∠MNO? _____

13. ∠XYZ is bisected by $\overrightarrow{YW}$. The measure of ∠XYW is 52°.

What is the measure of ∠WYZ? What is the measure of ∠XYZ?

The measure of ∠WYZ is _____.　　　The measure of ∠XYZ is _____.

14. ∠BCD is bisected by $\overrightarrow{CE}$. The measure of ∠DCE is 79°.

What is the measure of ∠BCE? What is the measure of ∠BCD?

The measure of ∠BCE is _____.　　　The measure of ∠BCD is _____.