Guided Practice

1. Describe the relationship between the angle measures of complementary angles, supplementary angles, vertical angles, and linear pairs.
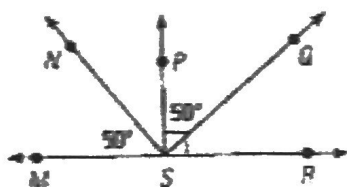
$$\text{Complementary}: m\angle 1 + m\angle 2 = 90$$
$$\text{Supplementary}: m\angle 1 + m\angle 2 = 180$$
$$*\text{Vertical}: m\angle 1 = \angle 2$$
$$\text{linear pair}: m\angle 1 + \angle 2 = 180$$

2. Identify the pair(s) of congruent angles in the figures below. Explain how you know they are congruent.
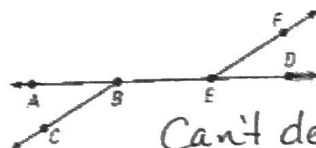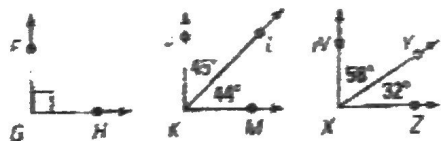
a.

$\angle msN \cong \angle PSQ$ same measure
$\angle NSP \cong \angle QSR$ b/c Complementary

b.

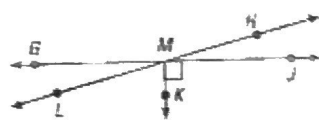$\angle FGH \cong \angle WXZ$ Both Complementary

c.

∠ABC is supplementary to ∠CBD.
∠CBD is supplementary to ∠DEF.

Can't determine Congruent ∠'s

d.

$\angle GML \cong \angle HMJ$ ⎫ vertical
$\angle GMH \cong \angle LMJ$ ⎭ Angles

3. Find the measure of each numbered angle.
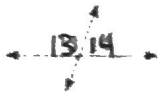
a. $m\angle 2 = 57°$

$180 - 57 =$
$m\angle 1 = 123°$

c. $m\angle 5 = 22°$

$90 - 22 = 68°$
$m\angle 6 = 68°$

e. $m\angle 1 = 38°$

$m\angle 1 = m\angle 2$
$38° = m\angle 2$
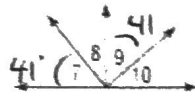
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b. $m\angle 13 = 4x + 11$,
$m\angle 14 = 3x + 1$

d. $\angle 9$ and $\angle 10$ are complementary.
$\angle 7 \cong \angle 9, m\angle = 41°$

f. $m\angle 2 = 4x - 26$
$m\angle 3 = 3x + 4$

$4x + 11 + 3x + 1 = 180$

$7x + 12 = 180$

$7x = 168$

$\boxed{X = 24}$

$90 - 41 = 49°$

$\boxed{\angle 8 \cong \angle 10 = 49°}$
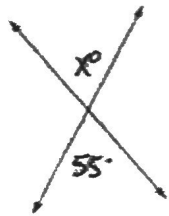
$4x - 26 = 3x + 4$

$\boxed{X = 30}$

Skills Practice

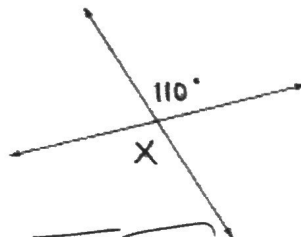Find the value of x in each figure.
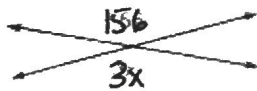
1.

$\boxed{X = 55°}$

2.

$\boxed{X = 110°}$

3.

$X - 5 = 42$

$\boxed{X = 47°}$

4.

$3x = 156$

$\boxed{X = 52°}$

5.

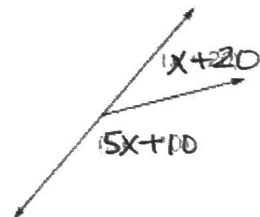$2x + 4 = 90$

$2x = 86$

$\boxed{X = 43°}$
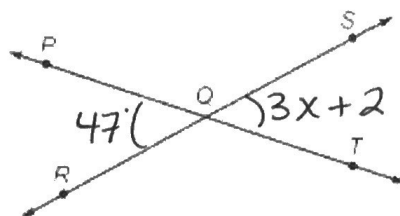
6.

$X + 20 + 5x + 10 = 180$

$6x + 30 = 180$

$6x = 150$

$\boxed{X = 25°}$

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7. What is the value of x if $\angle PQR$ and $\angle SQT$ are vertical angles and $m\angle PQR = 47°$ and $m\angle SQT = 3x + 2$?
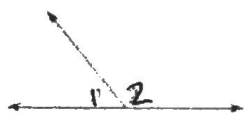
$3x + 2 = 47$

$3x = 45$

$\boxed{x = 15°}$

8. Find the measure of an angle that is supplementary to $\angle B$ if the measure of $\angle B$ is 58°

$x + 58 = 180$

$\boxed{x = 122°}$

Find the measure of each numbered angle and name the theorems that justify your work.
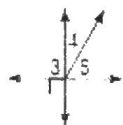
9. $m\angle 1 = x + 10$
   $m\angle 2 = 3x + 18$

$x + 10 + 3x + 18 = 180$

$4x + 28 = 180$

$4x = 152$

$\boxed{x = 38°}$

10. $m\angle 4 = 2x - 5$
    $m\angle 5 = 4x - 13$

$2x - 5 + 4x - 13 = 90$

$6x - 18 = 90$

$6x = 108$

$\boxed{x = 18°}$

11. $m\angle 6 = 7x - 24$
    $m\angle = 5x + 14$

$7x - 24 = 5x + 14$

$2x = 38$

$\boxed{x = 19°}$

12. x = __21__

$m\angle MAT = \underline{133°}$

$7(21) + 14$

$7x - 14 + 2x + 5 = 180$

$9x - 9 = 180$

$9x = 189$

$\boxed{x = 21}$

M $7x-14$ $2x+5$
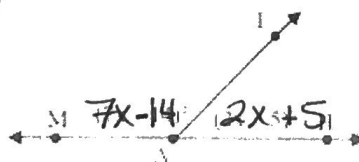
13. x = __7°__

$m\angle PIR = \underline{52°}$

$m\angle RIM = \underline{52°}$

$4(7) + 24$

$7(7) + 3$

$4x + 24 = 7x + 3$

$24 = 3x + 3$

$21 = 3x$

$\boxed{7 = x}$
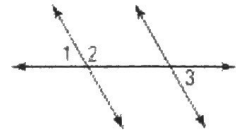
$4x + 24$ $7x + 3$

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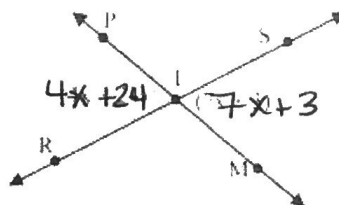
12. Write a two-column proof.

Given: $\angle 1$ and $\angle 2$ form a linear pair and $\angle 2$ and $\angle 3$ are supplementary

Prove: $\angle 1 \cong \angle 3$

Statement	Reason
1. $\angle 1$ and $\angle 2$ form a linear pair	1. Given
2. $\angle 2$ and $\angle 3$ are supplementary	2. Given
3. $m\angle 1 + m\angle 2 = 180$	3. Def. of linear pair
4. $m\angle 2 + m\angle 3 = 180$	4. Def. of supplementary $\angle$'s
5. $m\angle 1 + m\angle 2 = m\angle 2 + m\angle 3$	5. Substitution Prop.
6. $m\angle 1 = m\angle 3$	6. Subtraction Prop.
7. $\angle 1 \cong \angle 3$	8. Def. of Congruent Angles