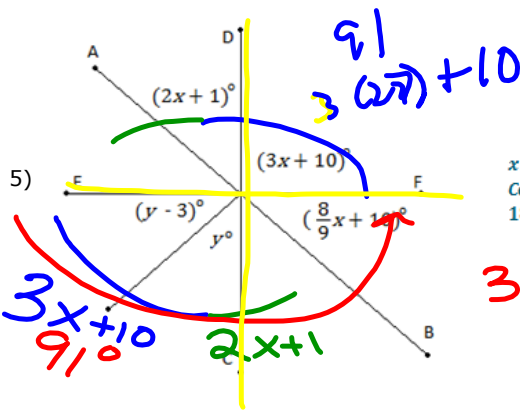Geometry CC – Unit 1
Lesson 3: Unknown Angles - Transversals (Auxiliary Lines)
M1 L7
**Homework**: Finish Classwork Packet

*HW Answers 1.2*

5)

$$9|$$
$$3(27)+10$$

$x = 27; y = 47$
*Consecutive adjacent angles on a line sum to 180°. Vertical angles are equal in measure*

$(2x+1)°$
$(3x+10)$
$(y-3)°$
$(\frac{8}{9}x+1)°$
$y°$

$$3x+10$$
$$91°$$
$$2x+1$$

$$3x+10+2x+1+\frac{8}{9}x+10=180$$

$$\frac{53}{9}x+21=186$$

$$\frac{53}{9}x=159$$

$$x=27$$

$$Y-3+Y=91$$
$$2Y=94$$
$$Y=47$$

$$97+b+36=180$$
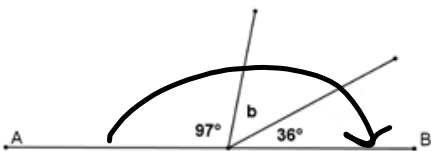$$133+b=180$$
$$b=47$$

6)

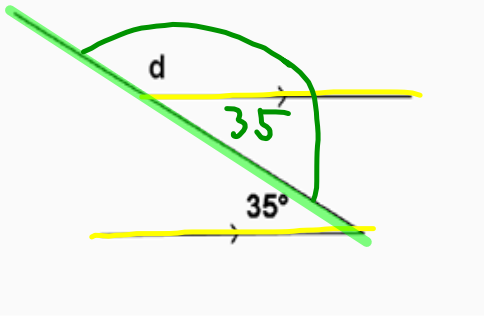$97°$   $b$   $36°$

$m\angle b = 47°$
*Consecutive adjacent angles on a line sum to 180°.*

In each exercise below, find the unknown labeled angles.  Give reasons for your solutions.

| Diagram/Work | Reason |
|---|---|
| 1.)<br><br>$d$    35   $35°$     $d + 35$ | If parallel lines are cut by a transversal, then alternate interior angles are equal in measure.<br><br><br>Linear pairs form supplementary angles. |

$$d + 35 = 180$$
$$-35 \qquad -35$$
$$d = 145$$

2.)



alt. Int ∠s

linear pairs

corresponding ∠s

$112 + f = 180$ ✓

$f = 68°$

| If parallel lines are cut by a transversal, then alternate interior angles are equal. |
|---|
| Vertical angles are equal in measure. |
| If two lines are parallel, same side interior angles are supplementary. |

3.)



① $m = 46°$

② $92 + 46 + K = 180$
    $K = 42°$

③ $J + 42 + 46 = 180$

$J = 92°$

| If two lines are parallel, alternate interior angles are equal. |
|---|
| If two lines are parallel, alternate interior angles are equal. |
| Consecutive adjacent angles on a line add up to 180. |

4.)



94° 68°

q 68°

p

94°
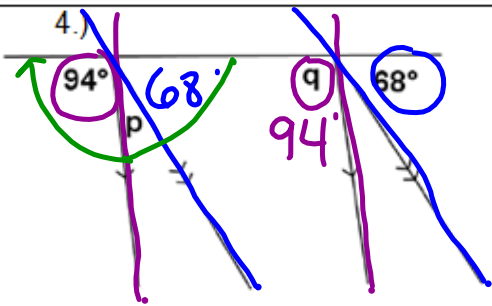
$q = 94$
corresp ∠'s

If two lines are parallel, corresponding angles are equal in measure.

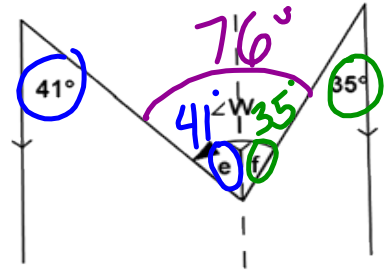Consecutive adjacent angles on a line sum to 180.

consec. adj ∠'s sum to 180

$94 + p + 68 = 180$

$p = 18°$

## Auxiliary Lines

- can be drawn into a diagram to help modify the diagram. Drawing auxiliary lines are helpful when solving for specific unknown measures.

76°
41°    41° ∠W 35°    35°
e  f

*same side int. ∠'s are supp.*

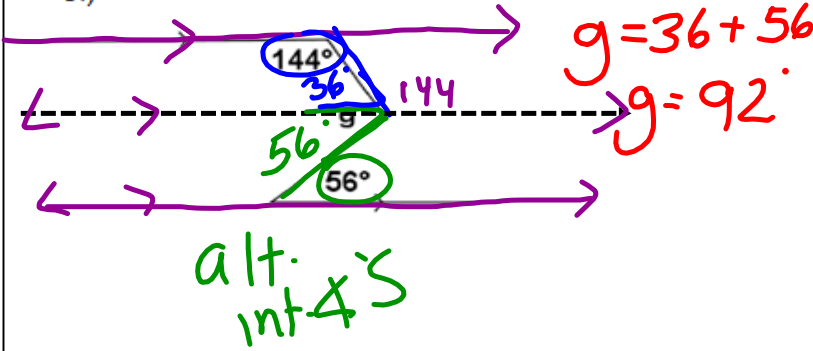| | |
|---|---|
| **5.)** 144° 36 144 56° g 56° *alt. int ∠'s* $g = 36 + 56$ $g = 92°$ | If parallel lines are cut by a transversal, alternate interior angles are equal. If parallel lines are cut by a transversal, same side interior angles are supplementary. Angle sum postulate |
| **6.)** 18° h 82° 162° 98° $h = 18 + 82$ $h = 100°$ | If parallel lines are cut by a transversal, same side interior angles are supplementary. Angle sum postulate. |