Worksheet #3 (Parallel Lines Cut by a Transversal)
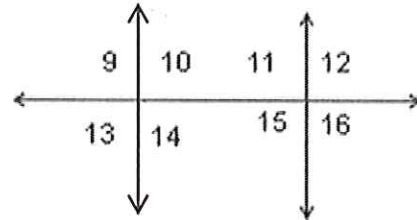
Name: _____ Date: _____ Period: _____

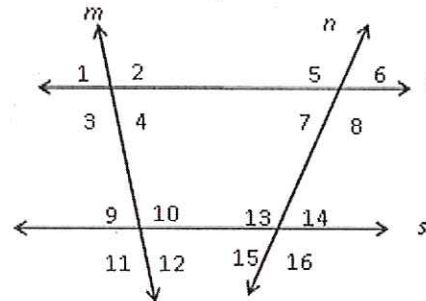Use the figure at the right to answer problems 1- 8.

Classify each pair of angles as one of the following:

(a) alternate interior angles   (b) corresponding angles

(c) alternate exterior angles   (d) vertical angles
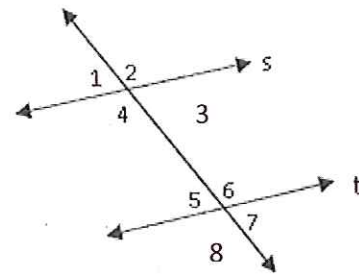
(e) supplementary angles   (f) none

1. _____ ∠9 & ∠16   5. _____ ∠9 & ∠11

2. _____ ∠15 & ∠11   6. _____ ∠9 & ∠15

3. _____ ∠10 & ∠15   7. _____ ∠13 & ∠14

4. _____ ∠12 & ∠15   8. _____ ∠14 & ∠11

9. $m\angle 2 = 97°$ $m\angle 6 = 83°$

     $m\angle 3 = $ _____ $m\angle 5 = $ _____

     $m\angle 10 = $ _____ $m\angle 7 = $ _____
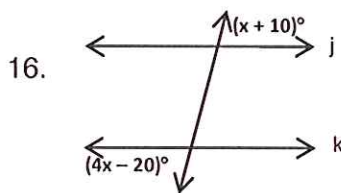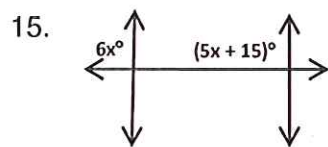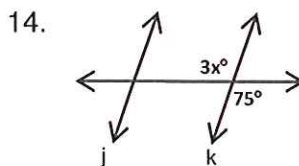
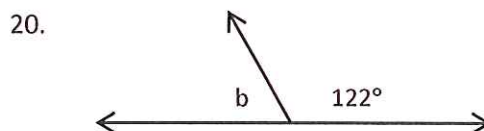 $m\angle 9 = $ _____ $m\angle 16 = $ _____

Find the value of x given that s // t
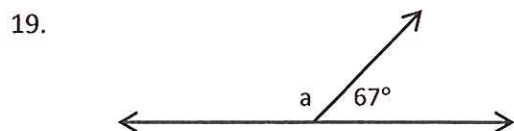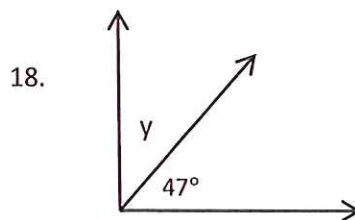
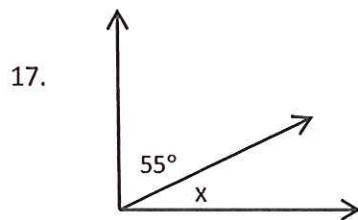10. $m\angle 4 = 77°$, $m\angle 8 = 4x + 57$

11. $m\angle 3 = 5x + 13$, $m\angle 5 = 53°$

12. $m\angle 1 = 6x - 5$, $m\angle 7 = 115°$

Find the value of x that makes j ‖ k.

13.

$(3x + 10)°$
j

$(5x - 10)°$
k

14.

$3x°$
$75°$
j   k

15.

$6x°$ $(5x + 15)°$

16.

$(x + 10)°$
j

$(4x - 20)°$
k
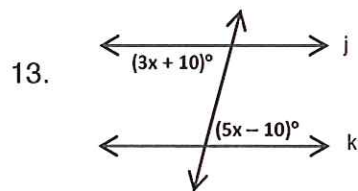
Determine the missing angles.

17.

$55°$
x

18.

y
$47°$

19.

a $67°$

20.

b $122°$

FINDING UNKNOWN ANGLE MEASURES #2

Directions: For each set of parallel lines, you are given the measure of one angle. Use your knowledge of parallel lines and transversals to find the measures of each other angle.

Example: Given an angle of 150°

```
        30°   150°
          150°  30°
              30°  150°
                150°  30°
```

1)
```
    ?  140°
      ?   ?

        ?   ?
          ?   ?
```

2)
```
         ?  ?
           ?  ?

        ?  50°
         ?  ?
```

3)
```
    ? ?
  92° ?        ? ?
                ? ?
```
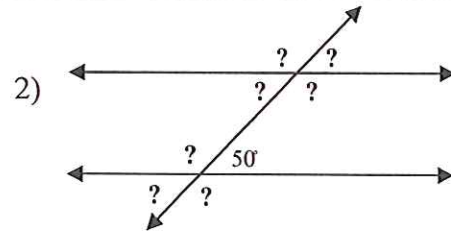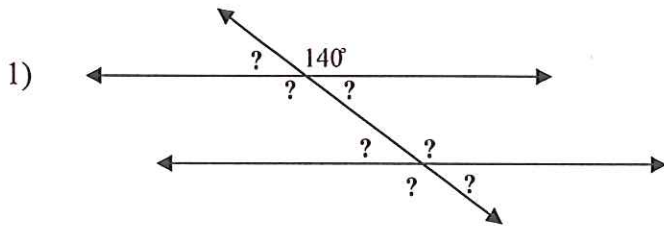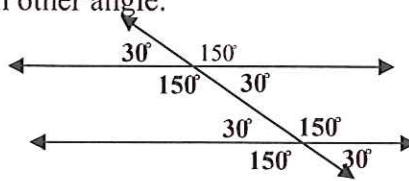
4)
```
        ?  ?
          ? 78°

        ?  ?
          ?  ?
```

5)
```
        ?  ?
          ?  ?

      ?  65°
        ?  ?
```

6)
```
    ?  90°
      ?  ?

    ?  ?
      ?  ?
```

7)
```
        ?  ?
  ? ?      ? 110°
  ? ?
```

8)
```
            ?  61.5°
          ?  ?
        ?  ?
          ?
```
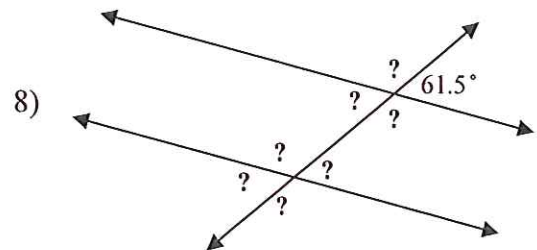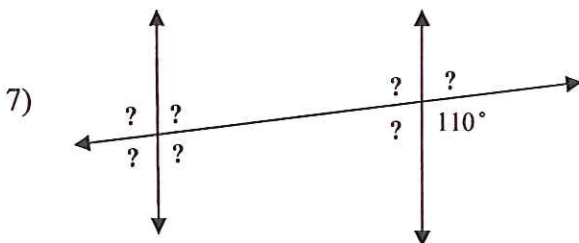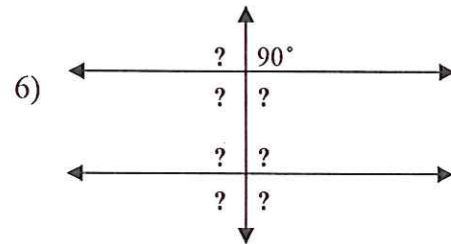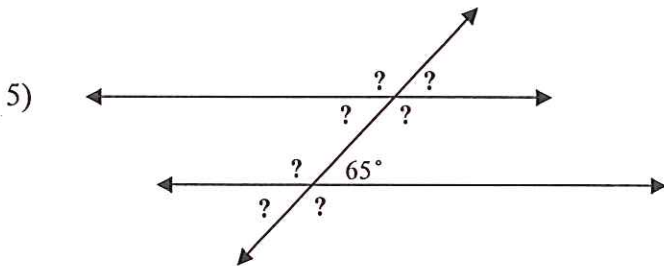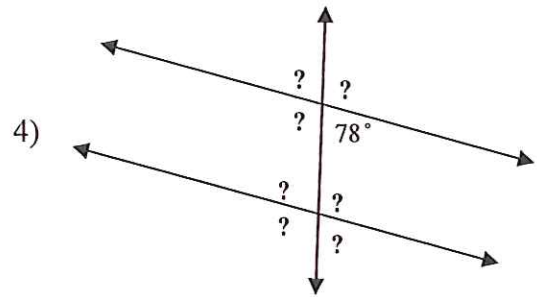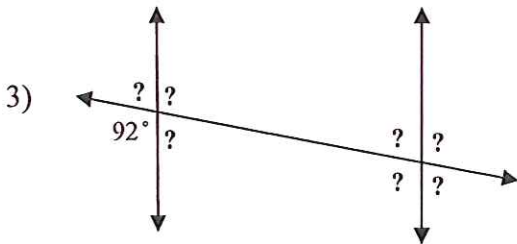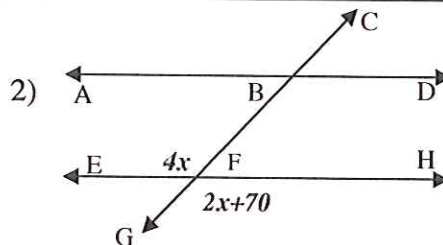
FINDING UNKNOWN ANGLE MEASURES—CONGRUENT ANGLES-#3

Directions: Find the measure of each missing angle in the parallel lines and transversals below. Each pair of angles are either *vertical angles*, *alternate angles*, or *corresponding angles*; so they are congruent. All you have to do is set up and solve an equation where the expressions are congruent. Once you've solved for x, plug that value back into each expression to find the measure of each angle.
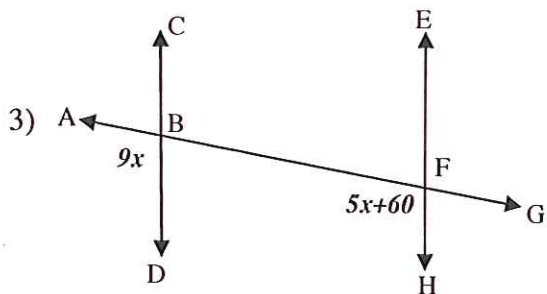
1)

$2x+60$

$4x$

Equation: _____

$x =$ _____ $\angle ABG =$ _____ $\angle CBD =$ _____
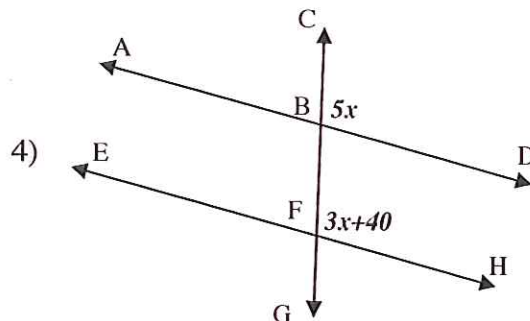
2)

$4x$

$2x+70$

Equation: _____

$x =$ _____ $\angle EFB =$ _____ $\angle GFH =$ _____

3)

$9x$

$5x+60$

Equation: _____

$x =$ _____ $\angle ABD =$ _____ $\angle HFA =$ _____

4)

$5x$

$3x+40$

Equation: _____

$x =$ _____ $\angle CBD =$ _____ $\angle HFC =$ _____

5)

$4x+84$

$16x$

Equation: _____

$x =$ _____ $\angle GBD =$ _____ $\angle EFC =$ _____

6)

$2x+30$

$3x$

Equation: _____

$x =$ _____ $\angle EFG =$ _____ $\angle HFC =$ _____