# Parallels Cut by a Transversal Day 2 Homework

Directions: Find the value of the variable, show your geometry, and justify your set up!

1.

F

$3x + 2$

$82°$ $60°$

G   H

$\angle F + \angle G + \angle H = 180°$
$\triangle$ sum
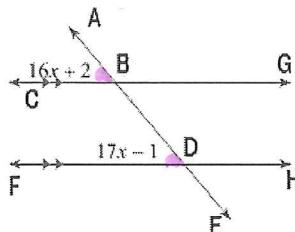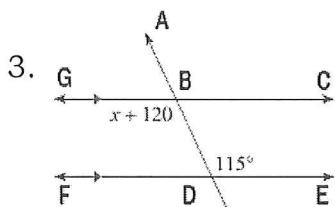
$3x + 2 + 82 + 60 = 180$
$3x + 144 = 180$
$3x = 36$
$\boxed{x = 12}$

2.

A

$16x + 2$ B   G
C

$17x - 1$ D
F   H

E
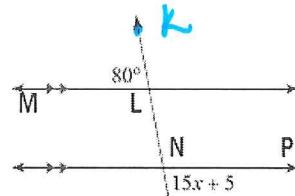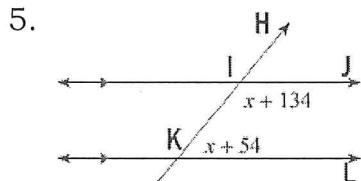
$\angle ABC \cong \angle BDF$ // lines form
$\cong$ corr. $\angle$s

$\boxed{x = 3}$

3.

A

G   B   C
$x + 120$

$115°$
F   D   E
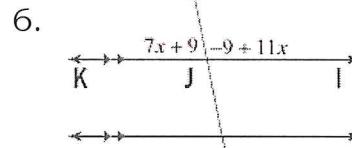
$\angle GBD \cong \angle BDE$ // lines form $\cong$ alt. int $\angle$s

$\boxed{x = -5}$

4.

k

$80°$
M   L

N   P
$15x + 5$

O
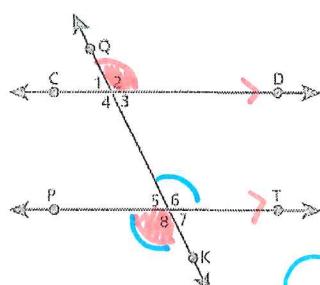
$\angle MLK \cong \angle ONP$ // lines form $\cong$ alt. ext angles

$\boxed{5 = x}$

5.

H

I   J
$x + 134$

K $x + 54$
L

$\angle JIK + \angle IKL = 180°$ // lines form suppl. con. int. $\angle$s

$\boxed{x = -4}$

6.

H

$7x + 9$ $-9 + 11x$
K   J   I

$\angle HJK + \angle HJI = 180°$ LINEAR PAIRS ARE SUPPL!!!

$\boxed{x = 10}$

7. If CD || PT, $m\angle 2 = (x^2 - 7x)°$, and $m\angle 7 = (-x + 7)°$ find x and $m\angle 6$.

Q
C 1 2 D
   4 3

P 5 6 T
   8 7
K

$\angle 2 \cong \angle 8$ // lines form $\cong$ alt. ext. $\angle$s.

$x^2 - 7x = -x + 7$
$x^2 - 6x - 7 = 0$
$(x - 7)(x + 1) = 0$
$x = 7$ $x = -1$
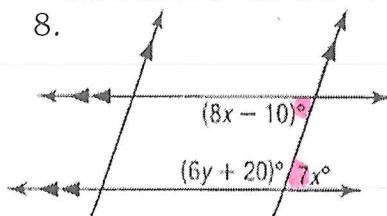
check x = 7
$\angle 2 = (7)^2 - 7(7) = 0$
$\angle 8 = (-(7) + 7) = 0$
$0 \neq$ an angle.

check x = -1
$\angle 2 = (-1)^2 - 7(-1) = 8°$ ✓
$\angle 8 = (--1 + 7) = 8°$

$x = -1$ and $\angle 6 = 8°$

Directions: Find the variable(s). Justify when there is no geometry available.

8.

(8x − 10)°

(6y + 20)° 7x°
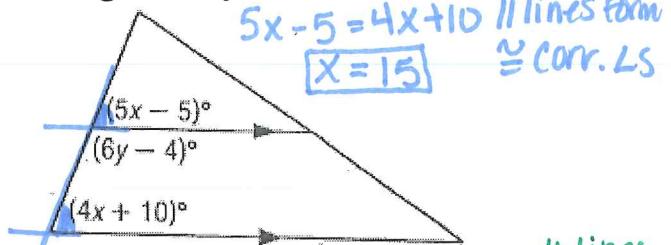
$8x - 10 = 7x$ // lines form ≅ alt.int.∠s
$\boxed{10 = X}$
$6y + 20 + 7(10) = 180$ linear
   Pairs are
$\boxed{y = 15}$ suppl.

9.

(5x − 5)°
(6y − 4)°

(4x + 10)°

$5x - 5 = 4x + 10$ // lines form
$\boxed{X = 15}$ ≅ corr. ∠s
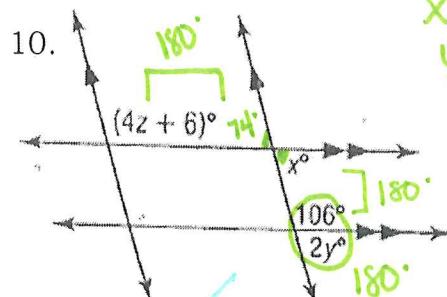
$6y - 4 + 4(15) + 10 = 180$ // lines
$\boxed{y = 19}$ form
   Suppl.
   Con. int
   angles

Find the variable(s). You do not need to justify.

10.

180°
(4z + 6)° 74°
x°
106°] 180°
2y°] 180°

$X = 74°$
$y = 37°$
$Z = 25°$

11.

Δ sum
50°
x° vertical
y° 70°
60°
50°) alt int
or
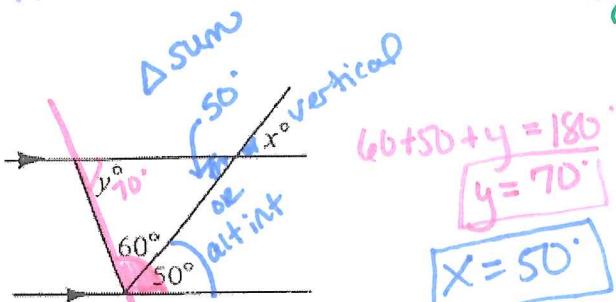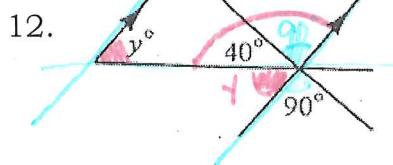
$60 + 50 + y = 180°$
$\boxed{y = 70°}$

$\boxed{X = 50°}$

40 + 90 + Y = 180
$\boxed{y = 50}$

12.

x°
y° 40°
90° 90°

$X + 50 + 40 = 180$
$\boxed{X = 90°}$

13.

60°
59° 61°
y°
x° 61°
60°

$\boxed{y = 61°}$
$\boxed{X = 60}$

$90 + 3y + 18 = 180$
$\boxed{y = 24°}$

14.

2y° z°
2x° 90° x°
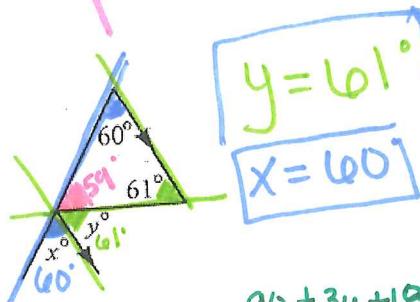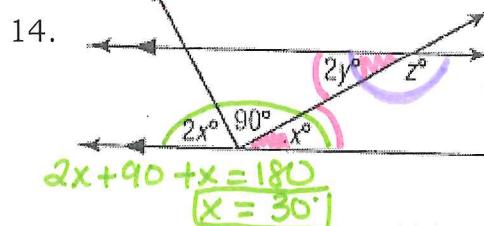
$2x + 90 + x = 180$
$\boxed{X = 30°}$
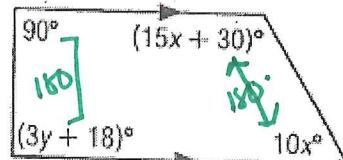
$30 = 2y$
$\boxed{15 = y}$
$30 + z = 180$
$\boxed{z = 150°}$

15.

90° (15x + 30)°
160
(3y + 18)° 10x°
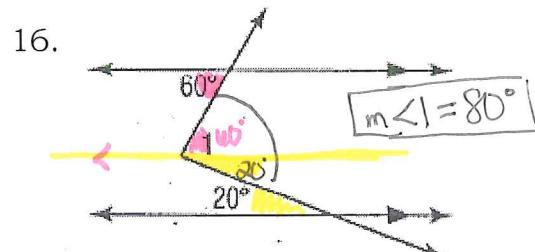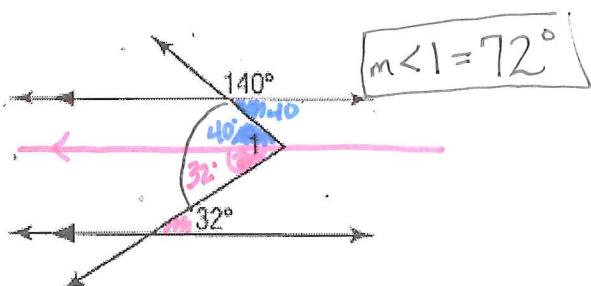
$15x + 30 + 10x = 180°$
$\boxed{X = 6}$

Without geometry or justifying, find x. You may draw more parallel lines or triangles.
You can use multiple methods.

16.

60°
1 100°
20°
20°

$\boxed{m∠1 = 80°}$

17.

140°
140
40° 1
32°
32°

$\boxed{m∠1 = 72°}$