Math 20-2 Name_____

# Parallel Line and Angle Problems

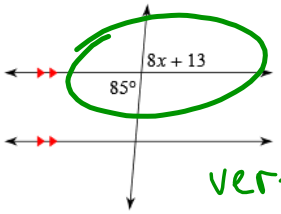
Date_____

**Name the angle pair and property:**
- alternate interior, equal.
- corresponding, equal.
- alternate exterior, equal.
- vertical, equal.
- straight line, add = 180
- same side interior, add = 180.

Triangles - angle sum = 180.

**Solve for *x*.**

1)



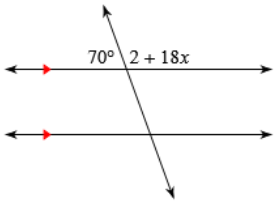

vertical, equal

$8x+13=85$ subtract 13

$8x=72$ $\div 8$

$x=9$

2)




straight line = 180

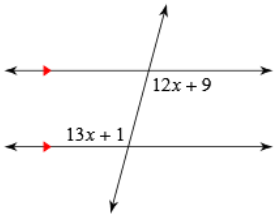
$70+2+18x=180$

$72+18x=180$
$-72 \quad -72$

$\frac{18x}{18}=\frac{108}{18}$

$x=6$

3)



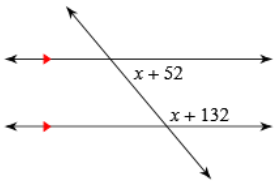

ALT INT, EQUAL

$13x+1=12x+9$
$-12x \quad -12x$ x one side

$x+1=9$
$-1 \quad -1$

$x=8$

4)




SAME SIDE INT, SUM = 180

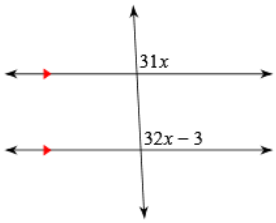
$x+52+x+132=180$

$2x+184=180$
$-184 \quad -184$

$\frac{2x}{2}=\frac{-4}{2}$

$x=-2$

5)




corresponding, equal

$31x = 32x - 3$ ... more x's?

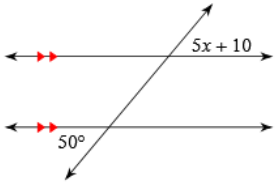
$-31x \quad -31x$

$0 = x - 3$

$+3 \quad +3$

$3 = x$ or $x = 3$

6)




ALT EXTERIOR, EQUAL

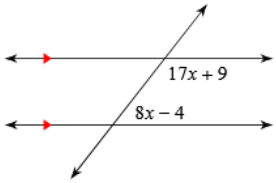
$5x + 10 = 50$

$-10 \quad -10$

$\frac{5x}{5} = \frac{40}{5}$

$x = 8$

7)




same side interior: sum = 180

$17x + 9 + 8x - 4 = 180$

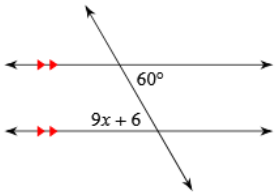
$25x + 5 = 180$

$-5 \quad -5$

$\frac{25x}{25} = \frac{175}{25}$

$x = 7$

8)




ALT INTERIOR, equal

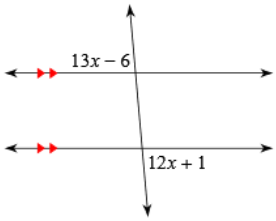
$9x + 6 = 60$

$-6 \quad -6$

$\frac{9x}{9} = \frac{54}{9}$

$x = 6$

9)




ALT EXTERIOR, equal

$13x - 6 = 12x + 1$

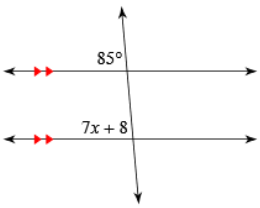
$-12x \quad -12x$

$x - 6 = 1$

$+6 \quad +6$

$x = 7$

10)




Corresponding, equal

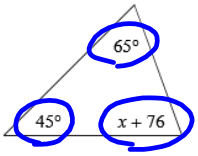
$85 = 7x + 8$

$-8 \quad -8$

$\frac{77}{7} = \frac{7x}{7}$

$11 = x$ OR $x = 11$

11)




ANGLE SUM = 180

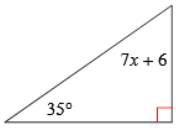
$45 + 65 + x + 76 = 180$

$186 + x = 180$

$-186 \quad -186$

$x = -6$

12)




angle sum = 180

$35 + 90 + 7x + 6 = 180$

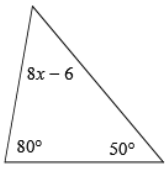
$131 + 7x = 180$

$-131 \quad -131$

$\frac{7x}{7} = \frac{49}{7}$

$x = 7$

13)




sum = 180

$50 + 80 + 8x - 6 = 180$

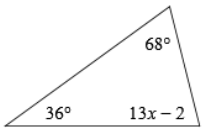
$124 + 8x = 180$

$-124 \quad -124$

$\frac{8x}{8} = \frac{56}{8}$

$x = 7$

14)




sum = 180

$36 + 68 + 13x - 2 = 180$

$102 + 13x = 180$

$-102 \quad -102$

$\frac{13x}{13} = \frac{78}{13}$

$x = 6$

# Answers to Parallel Line and Angle Problems

| | | | |
|---|---|---|---|
| 1) 9 | 2) 6 | 3) 8 | 4) −2 |
| 5) 3 | 6) 8 | 7) 7 | 8) 6 |
| 9) 7 | 10) 11 | 11) −6 | 12) 7 |
| 13) 7 | 14) 6 | | |