1-9: Find x and y in each parallelogram based on the properties. Show your work!

1.

$5y°$
$(3x + 60)°$
$60°$

$5y=60$ $3X+60+60=180$
$y=12$ $3X+120=180$
            $3X=60$
            $X=20$

2.

$30°$
$45°$ $(5x^2)°$
$30°$

$5x^2=45$
$x^2=9$ $X=3$

3.

$(5x - 10)°$
$(12x - 14)°$

$5X-10+12x-14=180$
$17X-24=180$
$17X=204 \Rightarrow X=12$

4.

$3y°$
$6x°$ $60°$ $12x°$

$6X+12X=180$ $3y+60=180$
$18X=180$ $3y=120$
$X=10$ $y=40$

5.

$55°$ $5x°$
$60°$
$2y°$ 55

$5X=2y$
$5X=2(32.5)$
$5X=65$
$X=13$

A: $2y+60+55=180$
$2y+115=180$
$2y=65$
$y=32.5$

6.

$2y$
$30x$ 150
$72x$

$30X=150$ $2y=72x$
$X=5$ $2y=72(5)$
            $2y=360$
            $y=180$

7.

$4y$
$3x$ 12
8

$3X=12$ $4y=8$
$X=4$ $y=2$

8.

$60°$
$2x°$
$4y$ 60 60

$2x=4y$
$2x=4(7.5)$
$2x=30$
$X=15$

$4y+4y+120=180$
$8y+120=180$
$8y=60$ $y=7.5$

9.

$2y$
28 $4x$

$2y=28$ $2y=4x$
$y=14$ $2(14)=4x$
          $28=14x$
          $2=x$

10-13: Use ▱ RSTU to find each measure or value.

10. m∠RST = $125°$ **11.** m∠STU = $55°$

12. m∠R̶S̶T̶ RTS = $30°$ **13.** b = 6 $4b-1=23$
                                              $4b=24$
                                              $b=6$

R $25°$ S
$30°$ $B|25$ 23
$4b - 1$ 30
U 25 T
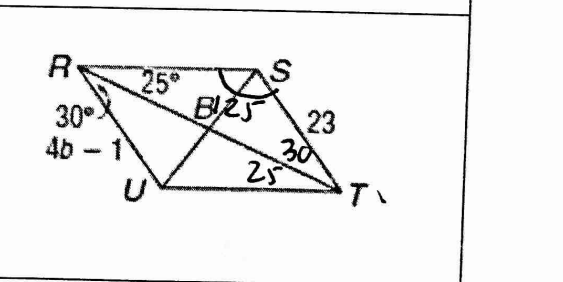
14-19: Fill in the blanks based on your knowledge of the given parallelogram below.
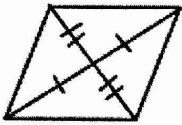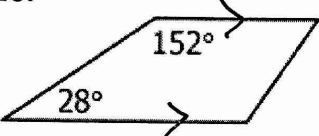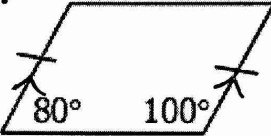
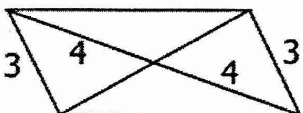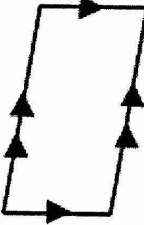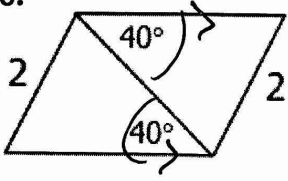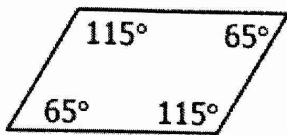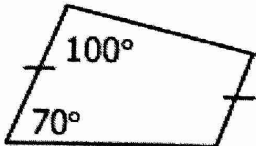**14.** $\overline{LQ} \cong$ $\overline{QN}$

15. ∠LMN ≅ $\angle LPN$

16. $\overline{PQ} \cong$ $\overline{QM}$

17. ∠NPL is supplementary to $\angle PLM$ and $\angle MNP$.

18. $\overline{LM} \cong$ $\overline{PN}$

19. ∠LMP ≅ $\angle MPN$

L M
Q
P N
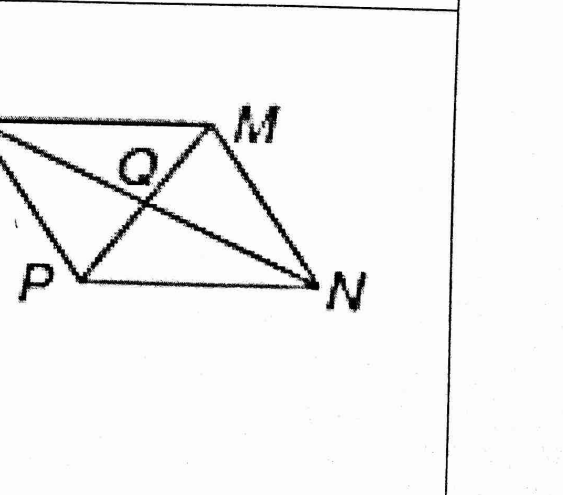
20-24: Circle words or phrases that can complete the following sentences to make statements that are (ALWAYS) true. (There may be more than one correct choice for some of the sentences.)

20. Opposite sides of a parallelogram are ((congruent)/perpendicular/(parallel)).

21. Consecutive angles of a parallelogram are (complementary/(supplementary)/congruent).

22. Opposite angles of a parallelogram are (complementary/supplementary/(congruent)).

23. The diagonals of a parallelogram ((bisect each other)/are perpendicular/are congruent).

24. If a parallelogram has one right angle, then all of its other angles are (acute/(right)/obtuse) angles.

25-32: Determine if each quadrilateral is a parallelogram. Explain your answer

25.	26. 152° 28°	27. 80° 100°	28. 3 4 4 3
Yes b/c the diagonals bisect each other	No b/c it only has 1 pair of ∥ sides, which makes it a trapezoid	Yes b/c since consec ∡s are supp, the opp. sides are ∥ and ≅, so it would be a ▱.	No b/c only 1 diagonal is bisected by the other & only 1 pair of opp. sides are ≅.

29.	30. 40° 2 2 40°	31. 115° 65° 65° 115°	32. 100° 70°
Yes by the def. of a ▱. (Both pairs of opp sides are ∥!)	No — this would be an isosceles trapezoid! 2 2	Yes b/c both pairs of opp angles are ≅ plus consec. ∡s are supp, which makes 2 pr. of ∥ sides.	No b/c consec. ∡s are not supp. & only 1 pr. of opp sides are ≅.